Trigonometry 12th edition Larson Test Bank

SKU: 9798214407593-TEST-BANK

Name:_____ Class:_____ Date:_____

Section 1.1 Radian and Degree Measure

1. Find (if possible) the complement of the following angle.

$\frac{\pi}{5}$

a. Complement: π
b. Complement: $-\frac{\pi}{5}$
c. Complement: $\frac{3\pi}{10}$
d. Complement: $\frac{3\pi}{5}$
e. Complement: $\frac{5}{3\pi}$

ANSWER: c

2. Find (if possible) the supplement of the following angle.

$\frac{\pi}{12}$

a. Supplement: $\frac{12}{11\pi}$
b. Supplement: $-\frac{\pi}{12}$
c. Supplement: π
d. Supplement: $\frac{\pi}{12}$
e. Supplement: $\frac{11\pi}{12}$

ANSWER: e

3. Find the complement of the following angle. Round your answer to two decimal places.

1.5

a. Complement ≈ 1.5
b. Complement ≈ 0.07
c. Complement ≈ 3.64
d. Complement ≈ 1.64
e. Complement ≈ 1.71

ANSWER: b

4. Find the quadrant in which the given angle lies.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

133°

a. Quadrant I
b. Quadrant IV
c. Quadrant III
d. Quadrant II
e. None of the above

ANSWER: d

5. Find the quadrant in which the given angle lies.

–111° 50'

a. Quadrant III
b. Quadrant I
c. Quadrant IV
d. Quadrant II
e. None of the above

ANSWER: a

6. Find the quadrant in which the given angle lies.

–53.6°

a. Quadrant I
b. Quadrant II
c. Quadrant IV
d. Quadrant III
e. None of the above

ANSWER: c

7. Find the complement of the following angle.

35°

a. Complement: 200°
b. Complement: 35°
c. Complement: 55°
d. Complement: 145°
e. Complement: 56°

ANSWER: c

8. Find the supplement of the following angle.

112°

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

a. Supplement: 248°
b. Supplement: 112°
c. Supplement: 68°
d. Supplement: 22°
e. Supplement: 69

ANSWER: c

9. Find angle 75° in radian measure as a multiple of π.

a. $\frac{4\pi}{3}$
b. $\frac{\sqrt{2}}{\pi}$
c. 12π
d. $\frac{5\pi}{12}$
e. $\frac{\pi\sqrt{2}}{2}$

ANSWER: d

10. Find angle –40° in radian measure as a multiple of π.

a. 9π
b. $\frac{\pi\sqrt{2}}{2}$
c. $-\frac{2\pi}{9}$
d. $\frac{\pi\sqrt{3}}{3}$
e. $\frac{2\pi}{9}$

ANSWER: c

11. Find angle $\frac{5\pi}{4}$ in degree measure.

a. 225°
b. 230°
c. 123°
d. 113°

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

e. 200°

ANSWER: a

12. Find angle $\frac{\pi}{10}$ in degree measure.

a. 14°
b. 9°
c. 23°
d. 18°
e. 53°

ANSWER: d

13. Convert the angle measure from degrees to radians. Round your answer to three decimal places.

75°

a. 75° ≈ 1.209 radians
b. 75° ≈ 7.958 radians
c. 75° ≈ 0.075 radian
d. 75° ≈ 1.609 radians
e. 75° ≈ 1.309 radians

ANSWER: e

14. Convert the angle measure from degrees to radians. Round to three decimal places.

–201.15°

a. –201.15° ≈ –3.811 radians
b. –201.15° ≈ –3.411 radians
c. –201.15° ≈ –3.511 radians
d. –201.15° ≈ 3.411 radians
e. –201.15° ≈ 3.511 radians

ANSWER: c

15. Convert the angle measure from degrees to radians. Round to three decimal places.

326°

a. 326° ≈ 5.690 radians
b. 326° ≈ 6.990 radians
c. 326° ≈ 5.590 radians
d. 326° ≈ 5.990 radians
e. 326° ≈ 0.326 radians

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

16. Convert the angle measure from degrees to radians. Round to three decimal places.

–0.45°

a. –0.45° ≈ –0.308 radian
b. –0.45° ≈ –0.092 radian
c. –0.45° ≈ –0.008 radian
d. –0.45° ≈ –1.308 radians
e. –0.45° ≈ –1.008 radians

ANSWER: c

17. Convert the angle measure from radians to degrees. Round to three decimal places.

$\frac{\pi}{9}$

a. $\frac{\pi}{9} = 20°$
b. $\frac{\pi}{9} = 25°$
c. $\frac{\pi}{9} = 10°$
d. $\frac{\pi}{9} = 15°$
e. $\frac{\pi}{9} = 55°$

ANSWER: a

18. Convert the angle measure from radians to degrees. Round to three decimal places.

$\frac{16\pi}{13}$

a. $\frac{16\pi}{13} \approx 221.538°$
b. $\frac{16\pi}{13} \approx 232.038°$
c. $\frac{16\pi}{13} \approx 216.138°$
d. $\frac{16\pi}{13} \approx 211.238°$
e. $\frac{16\pi}{13} \approx 227.138°$

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

19. Convert the angle measure from radians to degrees. Round to three decimal places.

–2

a. $-2 \approx -124.892°$
b. $-2 \approx -119.992°$
c. $-2 \approx -114.592°$
d. $-2 \approx -104.092°$
e. $-2 \approx -108.992°$

ANSWER: c

20. Convert angle measure to decimal degree form. Round your answer to three decimal places.

263°38'

a. 263°38' ≈ 301°
b. 263°38' ≈ 263.38°
c. 263°38' ≈ 273.633°
d. 263°38' ≈ 263.633°
e. 263°38' ≈ 253.633°

ANSWER: d

21. Convert angle measure to decimal degree form. Round your answer to three decimal places.

$81° \, 35' \, 29''$

a. $81° \, 35' \, 29'' \approx 81.591°$
b. $81° \, 35' \, 29'' \approx 81.353°$
c. $81° \, 35' \, 29'' \approx 91.591°$
d. $81° \, 35' \, 29'' \approx 145°$
e. $81° \, 35' \, 29'' \approx 71.591°$

ANSWER: a

22. Convert following angle measure to degrees, minutes, and seconds.

250.3°

a. $250.3° \approx 250°3'$
b. $250.3° \approx 250°18'$
c. $250.3° \approx 250°16'$
d. $250.3° \approx 250°20'$
e. $250.3° \approx 250°17'$

ANSWER: b

23. Convert following angle measure to degrees, minutes, and seconds.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

–350.120°

a. $-350.120° \approx -350° \, 12' \, 7''$
b. $-350.120° \approx -350° \, 5' \, 18''$
c. $-350.120° \approx -350° \, 7' \, 12''$
d. $-350.120° \approx -350° \, 18' \, 5''$
e. $-350.120° \approx -350° \, 5' \, 12''$

ANSWER: c

24. Find the length of the arc on a circle of radius r intercepted by a central angle θ. Round to two decimal places.

Radius r	*Central Angle θ*
18 inches	134°

a. $s \approx 42.10$ inches
b. $s \approx 18.74$ inches
c. $s \approx 13.40$ inches
d. $s \approx 44.10$ inches
e. $s \approx 40.10$ inches

ANSWER: a

25. Find the length of the arc on a circle of radius r intercepted by a central angle θ. Round to two decimal places.

Radius r	*Central Angle θ*
20 centimeters	66°

a. $s \approx 25.04$ centimeters
b. $s \approx 20.37$ centimeters
c. $s \approx 23.04$ centimeters
d. $s \approx 7.33$ centimeters
e. $s \approx 21.04$ centimeters

ANSWER: c

26. Find the radian measure of the central angle of a circle of radius r that intercepts an arc of length s.

Radius r	*Arc Length s*
7 inches	20 inches

a. $\theta = 140$ radians
b. $\theta = \frac{7}{20}$ radians
c. $\theta = \frac{7}{27}$ radians

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

d. $\theta = \frac{20}{7}$ radians

e. $\theta = 27$ radians

ANSWER: d

27. Find the radian measure of the central angle of a circle of radius r that intercepts an arc of length s.

Radius r	*Arc Length s*
70 kilometers	150 kilometers

a. $\theta = 6$ radians

b. $\theta = \frac{15}{22}$ radians

c. $\theta = \frac{22}{15}$ radians

d. $\theta = \frac{15}{7}$ radians

e. $\theta = \frac{7}{15}$ radians

ANSWER: d

28. Find the area of the sector of the circle with radius r and central angle θ. Round to two decimal places.

Radius r	*Central Angle θ*
8 inches	$\frac{\pi}{3}$

a. $A \approx 268.08$ square inches

b. $A \approx 35.51$ square inches

c. $A \approx 67.02$ square inches

d. $A \approx 31.51$ square inches

e. $A \approx 33.51$ square inches

ANSWER: e

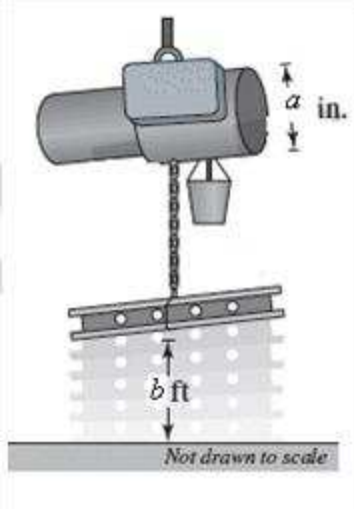
29. An electric hoist is being used to lift a beam. The diameter of the drum on the hoist is 13 inches, and the beam must be raised 2 feet. Find the number of degrees through which the drum must rotate. Round your answer to nearest whole number.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 1.1 Radian and Degree Measure



$a = 13, b = 2$

a. $\theta \approx 217°$
b. $\theta \approx 212°$
c. $\theta \approx 202°$
d. $\theta \approx 207°$
e. $\theta \approx 156°$

ANSWER: b

30. A carousel with a 55-foot diameter makes 5 revolutions per minute. Find the angular speed of the carousel in radians per minute. Round your answer to two decimal places.

a. 5 rpm ≈ 59.85 radians per minute
b. 5 rpm ≈ 31.42 radians per minute
c. 5 rpm ≈ 47.12 radians per minute
d. 5 rpm ≈ 15.71 radians per minute
e. 5 rpm ≈ 50.23 radians per minute

ANSWER: b

31. A sprinkler on a golf green is set to spray water over a distance of 11 meters and to rotate through an angle of 130°. Find the area of the region. Round your answer to two decimal places.

a. $A \approx 137.27$ square meters
b. $A \approx 139.57$ square meters
c. $A \approx 135.17$ square meters
d. $A \approx 274.54$ square meters
e. $A \approx 24.96$ square meters

ANSWER: a

32. Determine the quadrant in which an angle, θ, lies if $\theta = \frac{8\pi}{7}$.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

a. 4th quadrant
b. 2nd quadrant
c. 1st quadrant
d. 3rd quadrant

ANSWER: d

33. Determine the quadrant in which an angle, θ, lies if $\theta = 6.10$ radians.

a. 2nd quadrant
b. 4th quadrant
c. 3rd quadrant
d. 1st quadrant

ANSWER: b

34. Determine two coterminal angles (one minimum positive and one maximum negative) for $\theta = \frac{2\pi}{3}$.

a. $\frac{10\pi}{3}, -\frac{8\pi}{3}$
b. $\frac{7\pi}{3}, -\frac{2\pi}{1.5}$
c. $\frac{5\pi}{3}, -\frac{7\pi}{3}$
d. $\frac{4\pi}{3}, -\frac{4\pi}{9}$
e. $\frac{8\pi}{3}, -\frac{4\pi}{3}$

ANSWER: e

35. Find (if possible) the complement of $\frac{\pi}{12}$.

a. $\frac{11\pi}{24}$
b. $\frac{3\pi}{8}$
c. $\frac{5\pi}{12}$
d. $\frac{11\pi}{12}$
e. not possible

ANSWER: c

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

36. Find (if possible) the supplement of $\frac{6\pi}{7}$.

a. $\frac{3\pi}{7}$

b. $\frac{13\pi}{14}$

c. $\frac{\pi}{7}$

d. $\frac{11\pi}{28}$

e. not possible

ANSWER: c

37. Determine the quadrant in which an angle with measure 117° lies.

a. 4th quadrant

b. 2nd quadrant

c. 3rd quadrant

d. 1st quadrant

ANSWER: b

38. Determine the quadrant in which an angle with measure –145°36′ lies.

a. 3rd quadrant

b. 2nd quadrant

c. 1st quadrant

d. 4th quadrant

ANSWER: a

39. Determine two coterminal angles (one minimum positive and one maximum negative) for $\theta = -488°$.

a. 142°, –218°

b. 322°, –398°

c. 232°, –308°

d. 142°, –308°

e. 232°, –128°

ANSWER: e

40. Rewrite 65° in radian measure as a multiple of π.

a. $\frac{13\pi}{12}$

b. $\frac{13\pi}{36}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

c. $\frac{13\pi}{2}$

d. $\frac{13\pi}{6}$

e. $\frac{13\pi}{9}$

ANSWER: b

41. Rewrite $\frac{19\pi}{36}$ in degree measure.

a. 95°
b. 143°
c. 190°
d. 48°
e. 63°

ANSWER: a

42. Rewrite $\frac{5\pi}{49}$ in degree measure. Round to three decimal places.

a. 18.367°
b. 27.551°
c. 22.959°
d. 3.673°
e. 9.184°

ANSWER: a

43. Rewrite 36.63° in radian measure. Round to three decimal places.

a. 0.128
b. 0.115
c. 0.077
d. 0.096
e. 0.639

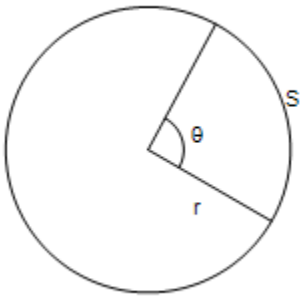
ANSWER: e

44. Find the angle, in radians, in the figure below if $S = 8$ and $r = 5$.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure



a. $\frac{8\pi}{5}$

b. $\frac{5}{8}$

c. $\frac{8}{5}$

d. $\frac{5\pi}{8}$

e. $\frac{13\pi}{5}$

ANSWER: c

45. Convert 177°45′33′′ to degree-decimal form. Round answer to three decimal places.

a. 177.755°

b. 177.759°

c. 178.537°

d. 177.377°

e. 177.380°

ANSWER: b

46. Convert 133.372° to $D°M′S′′$ form.

a. 133°11′10′′

b. 133°18′16′′

c. 133°16′14′′

d. 133°5′5′′

e. 133°22′19′′

ANSWER: e

47. Find the length of the arc, S, on a circle of radius 6 meters intercepted by a central angle of 30°. Round to two decimal places.

a. $S = 3.14$ meters

b. $S = 4.19$ meters

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

c. $S = 6.28$ meters
d. $S = 2.09$ meters
e. $S = 2.51$ meters

ANSWER: a

48. Find the radian measure of the central angle of the circle of radius 7 inches that intercepts an arc of length 23 inches.

a. $\theta = \frac{23}{7}$

b. $\theta = \frac{1}{7}$

c. $\theta = \frac{7}{23}$

d. $\theta = \frac{23}{8}$

e. $\theta = \frac{7}{2}$

ANSWER: a

49. Find the area of the sector of the circle with radius 2 feet and central angle $\frac{5\pi}{6}$.

a. $A = \frac{5\pi}{6}$ ft^2

b. $A = \frac{25\pi}{3}$ ft^2

c. $A = \frac{5\pi}{3}$ ft^2

d. $A = \frac{5\pi}{4}$ ft^2

e. $A = \frac{10\pi}{3}$ ft^2

ANSWER: c

50. A car is traveling along Route 66 at a rate of 70 miles per hour, and the diameter of its wheels are 2.7 feet. Find the number of revolutions per minute the wheels are turning. Round answer to one decimal place.

a. 363.1 rpm
b. 1075.9 rpm
c. 726.2 rpm
d. 137.5 rpm
e. 242.1 rpm

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 1.1 Radian and Degree Measure

ANSWER: c

51. Determine the quadrant in which an angle, θ, lies if $\theta = \frac{11\pi}{10}$.

a. 1st quadrant
b. 2nd quadrant
c. 3rd quadrant
d. 4th quadrant

ANSWER: c

52. Determine the quadrant in which an angle, θ, lies if $\theta = 6.10$ radians.

a. 1st quadrant
b. 2nd quadrant
c. 3rd quadrant
d. 4th quadrant

ANSWER: d

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

1. Use the given values to evaluate three trigonometric functions cos *x*, csc *x,* tan *x*.

$\sin x = \frac{1}{3}, \cos x > 0$

a. $\cos x = -\frac{2\sqrt{2}}{3}$

$\csc x = 3$

$\tan x = \frac{\sqrt{2}}{4}$

b. $\cos x = \frac{2\sqrt{2}}{3}$

$\csc x = 3$

$\tan x = -\frac{\sqrt{2}}{4}$

c. $\cos x = -\frac{2\sqrt{2}}{3}$

$\csc x = -3$

$\tan x = -\frac{\sqrt{2}}{4}$

d. $\cos x = \frac{2\sqrt{2}}{3}$

$\csc x = 3$

$\tan x = \frac{\sqrt{2}}{4}$

e. $\cos x = \frac{2\sqrt{2}}{3}$

$\csc x = \frac{1}{3}$

$\tan x = \frac{\sqrt{2}}{4}$

ANSWER: d

2. Use the given values to evaluate three trigonometric functions cos *x,* csc *x,* tan *x*.

$\sec x = \sqrt{6}, \sin x = -\frac{\sqrt{30}}{6}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

a. $\cos x = \frac{\sqrt{6}}{6}$

$\csc x = -\frac{\sqrt{30}}{5}$

$\tan x = -\sqrt{5}$

b. $\cos x = -\frac{\sqrt{6}}{6}$

$\csc x = -\frac{\sqrt{30}}{5}$

$\tan x = -\sqrt{5}$

c. $\cos x = \frac{\sqrt{30}}{30}$

$\csc x = \frac{\sqrt{30}}{5}$

$\tan x = \sqrt{5}$

d. $\cos x = \frac{\sqrt{6}}{6}$

$\csc x = -\frac{\sqrt{30}}{5}$

$\tan x = \sqrt{5}$

e. $\cos x = \frac{\sqrt{30}}{30}$

$\csc x = \frac{\sqrt{30}}{5}$

$\tan x = -\sqrt{5}$

ANSWER: a

3. Use the given values to evaluate three trigonometric functions sin x, cos x, cot x.

$\csc x = \frac{17}{8}, \tan x = \frac{8}{15}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

a. $\sin x = \frac{17}{8}$

$\cot x = \frac{15}{8}$

$\cos x = \frac{15}{17}$

b. $\sin x = \frac{15}{8}$

$\cot x = \frac{8}{17}$

$\cos x = \frac{15}{17}$

c. $\sin x = \frac{15}{17}$

$\cot x = \frac{15}{8}$

$\cos x = \frac{8}{17}$

d. $\sin x = \frac{8}{17}$

$\cot x = \frac{15}{8}$

$\cos x = \frac{15}{17}$

e. $\sin x = \frac{8}{17}$

$\cot x = \frac{15}{17}$

$\cos x = \frac{15}{8}$

ANSWER: d

4. Use the given values to evaluate three trigonometric functions $\cos x$, $\sin x$, $\cot x$.

$\tan x = \frac{9}{40}$, $\sec x = -\frac{41}{40}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

a. $\cos x = \frac{40}{41}$

$\sin x = \frac{9}{41}$

$\cot x = \frac{40}{9}$

b. $\cos x = -\frac{40}{41}$

$\sin x = -\frac{9}{41}$

$\cot x = -\frac{40}{9}$

c. $\cos x = -\frac{40}{41}$

$\sin x = -\frac{9}{41}$

$\cot x = \frac{40}{9}$

d. $\cos x = \frac{40}{41}$

$\sin x = -\frac{9}{41}$

$\cot x = -\frac{40}{9}$

e. $\cos x = -\frac{40}{41}$

$\sin x = \frac{9}{41}$

$\cot x = \frac{40}{9}$

ANSWER: c

5. Use the given values to evaluate two trigonometric functions $\tan \varphi$ and $\csc \psi$.

$\cot \varphi = -3, \sin \psi = \frac{\sqrt{10}}{10}$

a. $\tan \varphi = -\frac{1}{3}$

$\csc \psi = \sqrt{10}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

b. $\tan \varphi = \frac{1}{3}$

$\csc \psi = \sqrt{10}$

c. $\tan \varphi = \frac{1}{3}$

$\csc \psi = -\sqrt{10}$

d. $\tan \varphi = -3$

$\csc \psi = \sqrt{10}$

e. $\tan \varphi = -\frac{1}{3}$

$\csc \psi = -\sqrt{10}$

ANSWER: a

6. Use the given values to evaluate three trigonometric functions $\cos \phi, \sin \phi, \tan \phi$.

$\sec \phi = \frac{3}{2}, \csc \phi = \frac{-3\sqrt{5}}{5}$

a. $\cos \phi = \frac{2}{3}$

$\sin \phi = -\frac{\sqrt{5}}{3}$

$\tan \phi = \frac{\sqrt{5}}{2}$

b. $\cos \phi = \frac{2}{3}$

$\sin \phi = \frac{\sqrt{5}}{3}$

$\tan \phi = -\frac{\sqrt{5}}{2}$

c. $\cos \phi = \frac{2}{3}$

$\sin \phi = -\frac{\sqrt{5}}{3}$

$\tan \phi = -\frac{\sqrt{5}}{2}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

d. $\cos\phi = \frac{2}{3}$

$\sin\phi = \frac{\sqrt{5}}{3}$

$\tan\phi = \frac{\sqrt{5}}{2}$

e. $\cos\phi = -\frac{2}{3}$

$\sin\phi = -\frac{\sqrt{5}}{3}$

$\tan\phi = -\frac{\sqrt{5}}{2}$

ANSWER: c

7. Use the given values to evaluate three trigonometric functions csc x, tan x, cot x.

$\cos\left(\frac{\pi}{2} - x\right) = \frac{9}{41}$, $\cos x = \frac{40}{41}$

a. $\csc x = -\frac{9}{5}$

$\tan x = -\frac{9}{40}$

$\cot x = -\frac{40}{9}$

b. $\csc x = -\frac{40}{9}$

$\tan x = \frac{9}{40}$

$\cot x = \frac{40}{9}$

c. $\csc x = \frac{40}{9}$

$\tan x = -\frac{9}{40}$

$\cot x = \frac{40}{9}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

d. $\csc x = \frac{41}{9}$

$\tan x = \frac{9}{40}$

$\cot x = \frac{40}{9}$

e. $\csc x = \frac{5}{9}$

$\tan x = \frac{9}{40}$

$\cot x = -\frac{40}{9}$

ANSWER: d

8. Use the given values to evaluatethree trigonometric functions cos x, sin x, tan x.

$\sec x = 4, \sin x > 0$

a. $\cos x = \frac{1}{4}$

$\sin x = -\frac{\sqrt{15}}{4}$

$\tan x = \sqrt{15}$

b. $\cos x = \frac{1}{4}$

$\sin x = \frac{\sqrt{15}}{4}$

$\tan x = \sqrt{15}$

c. $\cos x = \frac{1}{4}$

$\sin x = -\frac{\sqrt{15}}{4}$

$\tan x = -\sqrt{15}$

d. $\cos x = -\frac{1}{4}$

$\sin x = \frac{\sqrt{15}}{4}$

$\tan x = \sqrt{15}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

e. $\cos x = -\frac{1}{4}$

$\sin x = -\frac{\sqrt{15}}{4}$

$\tan x = -\sqrt{15}$

ANSWER: b

9. Use the given values to evaluate three trigonometric functions $\cot \theta$, $\sec \theta$, $\cos \theta$.

$\tan \theta = 4$, $\cos \theta < 0$

a. $\cot \theta = \frac{1}{4}$

$\sec \theta = -\sqrt{17}$

$\cos \theta = \frac{\sqrt{17}}{17}$

b. $\cot \theta = 4$

$\sec \theta = \sqrt{17}$

$\cos \theta = \frac{\sqrt{17}}{17}$

c. $\cot \theta = \frac{1}{4}$

$\sec \theta = -\sqrt{17}$

$\cos \theta = -\frac{\sqrt{17}}{17}$

d. $\cot \theta = -\frac{1}{4}$

$\sec \theta = -\sqrt{17}$

$\cos \theta = -\frac{\sqrt{17}}{17}$

e. $\cot \theta = \frac{1}{4}$

$\sec \theta = \sqrt{17}$

$\cos \theta = -\frac{\sqrt{17}}{17}$

ANSWER: c

10. Use the given values to evaluate three trigonometric functions $\csc \theta$, $\tan \theta$, $\cos \theta$.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

$\sin\theta = -1, \cot\theta = 0$

a. $\csc\theta$ is undefined.
   $\tan\theta = -1$
   $\cos\theta = 0$

b. $\csc\theta = -1$
   $\tan\theta$ is undefined.
   $\cos\theta = 1$

c. $\csc\theta = -1$
   $\tan\theta$ is undefined.
   $\cos\theta = 0$

d. $\csc\theta = -1$
   $\tan\theta$ is undefined.
   $\cos\theta = -1$

e. $\csc\theta = 1$
   $\tan\theta$ is undefined.
   $\cos\theta = -1$

ANSWER: c

11. Use the fundamental identities to simplify the expression.

$\cot\theta \sec\theta$

a. $\tan\theta$
b. $\sec\theta \cot\theta$
c. $\csc\theta$
d. $\cot\theta$
e. $\cos\theta$

ANSWER: c

12. Use the fundamental identities to simplify the expression.

$$\frac{\tan\theta}{\sec\theta}$$

a. $\cot\theta$
b. $\tan\theta$
c. $\sec\theta$
d. $\sin\theta$
e. $\csc\theta$

ANSWER: d

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

13. Perform the multiplication and use the fundamental identities to simplify.

$(\sin x - \cos x)^2$

a. $1 + \sin x + \cos x$

b. $2 - 2\sin x \cos x$

c. $1 - 2\sin x \cos x$

d. $1 + 2\sin x + \cos x$

e. $1 - \sin x \cos x$

ANSWER: c

14. By using a graphing utility to complete the following table. Round your answer to four decimal places.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	---	---	---	---	---	---	---
y_2	---	---	---	---	---	---	---

$y_1 = \cos\left(\frac{\pi}{2} - x\right), y_2 = \sin x$

a.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	−0.3894	0.5646	0.7174	0.8415	0.9320	0.9854	0.9996
y_2	−0.3894	0.5646	0.7174	0.8415	0.9320	0.9854	0.9996

b.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	0.3894	−0.5646	0.7174	0.8415	0.9320	0.9854	0.9996
y_2	0.3894	−0.5646	0.7174	0.8415	0.9320	0.9854	0.9996

c.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	0.3894	0.5646	−0.7174	0.8415	0.9320	0.9854	0.9996
y_2	0.3894	0.5646	−0.7174	0.8415	0.9320	0.9854	0.9996

d.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	0.3894	0.5646	0.7174	−0.8415	0.9320	0.9854	0.9996
y_2	0.3894	0.5646	0.7174	−0.8415	0.9320	0.9854	0.9996

e.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	0.3894	0.5646	0.7174	0.8415	0.9320	0.9854	0.9996
y_2	0.3894	0.5646	0.7174	0.8415	0.9320	0.9854	0.9996

ANSWER: e

15. By using a graphing utility to complete the following table. Round your answer to four decimal places.

x	0.2	0.4	0.6	0.8	1	1.2	1.4
y_1	---	---	---	---	---	---	---
y_2	---	---	---	---	---	---	---

$y_1 = \sec x - \cos x, y_2 = \sin x \tan x$

a.

x	0.2	0.4	0.6	0.8	1	1.2	1.4
y_1	0.0403	0.1646	0.3863	0.7386	1.3105	2.3973	5.7135
y_2	0.0403	0.1646	0.3863	0.7386	1.3105	2.3973	5.7135

b.

x	0.2	0.4	0.6	0.8	1	1.2	1.4
y_1	0.0403	0.1646	−0.3863	0.7386	1.3105	2.3973	5.7135
y_2	0.0403	0.1646	−0.3863	0.7386	1.3105	2.3973	5.7135

c.

x	0.2	0.4	0.6	0.8	1	1.2	1.4
y_1	0.0403	−0.1646	0.3863	0.7386	1.3105	2.3973	5.7135
y_2	0.0403	−0.1646	0.3863	0.7386	1.3105	2.3973	5.7135

d.

x	0.2	0.4	0.6	0.8	1	1.2	1.4
y_1	−0.0403	0.1646	0.3863	0.7386	1.3105	2.3973	5.7135
y_2	−0.0403	0.1646	0.3863	0.7386	1.3105	2.3973	5.7135

e.

x	0.2	0.4	0.6	0.8	1	1.2	1.4
y_1	0.0403	0.1646	0.3863	−0.7386	1.3105	2.3973	5.7135
y_2	0.0403	0.1646	0.3863	−0.7386	1.3105	2.3973	5.7135

ANSWER: a

16. By using a graphing utility to complete the following table. Round your answer to four decimal places.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

y_1	---	---	---	---	---	---	---
y_2	---	---	---	---	---	---	---

$$y_1 = \frac{\cos x}{1 - \sin x},\ y_2 = \frac{1 + \sin x}{\cos x}$$

a.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	1.5085	1.8958	2.4650	−3.4082	5.3319	11.6814	–68.4797
y_2	1.5085	1.8958	2.4650	−3.4082	5.3319	11.6814	–68.4797

b.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	−1.5085	1.8958	2.4650	3.4082	5.3319	11.6814	–68.4797
y_2	−1.5085	1.8958	2.4650	3.4082	5.3319	11.6814	–68.4797

c.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	1.5085	1.8958	2.4650	3.4082	–5.3319	11.6814	–68.4797
y_2	1.5085	1.8958	2.4650	3.4082	–5.3319	11.6814	–68.4797

d.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	1.5085	1.8958	−2.4650	3.4082	5.3319	11.6814	–68.4797
y_2	1.5085	1.8958	−2.4650	3.4082	5.3319	11.6814	–68.4797

e.

x	0.4	0.6	0.8	1.0	1.2	1.4	1.6
y_1	1.5085	1.8958	2.4650	3.4082	5.3319	11.6814	–68.4797
y_2	1.5085	1.8958	2.4650	3.4082	5.3319	11.6814	–68.4797

ANSWER: e

17. By using a graphing utility to complete the following table. Round your answer to two decimal places.

x	0.6	0.8	1.0	1.2	1.4	1.6	1.8
y_1	---	---	---	---	---	---	---
y_2	---	---	---	---	---	---	---

$$y_1 = \sec^4 x - \sec^2 x,\ y_2 = \tan^2 x \sec^2 x$$

a.

x	0.6	0.8	1.0	1.2	1.4	1.6	1.8
y_1	−0.69	2.18	8.31	50.39	1,163.61	1,374,442.49	355.90
y_2	−0.69	2.18	8.31	50.39	1,163.61	1,374,442.49	355.90

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

b.

x	0.6	0.8	1.0	1.2	1.4	1.6	1.8
y_1	0.69	2.18	8.31	50.39	1,163.61	1,374,442.49	355.90
y_2	0.69	2.18	8.31	50.39	1,163.61	1,374,442.49	355.90

c.

x	0.6	0.8	1.0	1.2	1.4	1.6	1.8
y_1	0.69	2.18	8.31	−50.39	1,163.61	1,374,442.49	355.90
y_2	0.69	2.18	8.31	−50.39	1,163.61	1,374,442.49	355.90

d.

x	0.6	0.8	1.0	1.2	1.4	1.6	1.8
y_1	0.69	2.18	−8.31	50.39	1,163.61	1,374,442.49	355.90
y_2	0.69	2.18	−8.31	50.39	1,163.61	1,374,442.49	355.90

e.

x	0.6	0.8	1.0	1.2	1.4	1.6	1.8
y_1	0.69	2.18	8.31	50.39	1,163.61	1,374,442.49	−355.90
y_2	0.69	2.18	8.31	50.39	1,163.61	1,374,442.49	−355.90

ANSWER: b

18. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

$\sqrt{9-x^2}, x = 3\cos\theta$

a. $9\cos\theta$
b. $9\sin\theta$
c. $3\sin\theta$
d. $-3\sin\theta$
e. $3\cos\theta$

ANSWER: c

19. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

$\sqrt{225-9x^2}, x = 5\cos\theta$

a. $5\cos\theta$
b. $225\sin\theta$
c. $-5\sin\theta$
d. $225\cos\theta$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

e. 15 sin θ

ANSWER: e

20. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

$\sqrt{25 - x^2}, x = 5\sin\theta$

a. 5 sin θ
b. −5 cos θ
c. 5 cos θ
d. 25 sin θ
e. 25 cos θ

ANSWER: c

21. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

$\sqrt{x^2 - 16}, x = 4\sec\theta$

a. 4 tan θ
b. 16 sec θ
c. −4 tan θ
d. 4 sec θ
e. 16 tan θ

ANSWER: a

22. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

$\sqrt{x^2 + 25}, x = 5\tan\theta$

a. −5 sec θ
b. 5 tan θ
c. 25 sec θ
d. 25 tan θ
e. 5 sec θ

ANSWER: e

23. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

$\sqrt{25x^2+36}, 5x = 6\tan\theta$

a. 25 tan θ
b. 5 tan θ
c. 25 sec θ
d. 6 sec θ
e. −5 sec θ

ANSWER: d

24. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

$\sqrt{2-x^2}, x = \sqrt{2}\sin\theta$

a. 2 sin θ
b. $-\sqrt{2}\cos\theta$
c. $\sqrt{2}\sin\theta$
d. $\sqrt{2}\cos\theta$
e. 2 cos θ

ANSWER: d

25. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

$\sqrt{11-x^2}, x = \sqrt{11}\sin\theta$

a. $-\sqrt{11}\cos\theta$
b. $\sqrt{11}\cos\theta$
c. $\sqrt{11}\sin\theta$
d. 11 cos θ
e. 11 sin θ

ANSWER: b

26. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$. Then find sin θ and cos θ.

$2 = \sqrt{4-x^2}, x = 2\sin\theta$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

a. $4\cos\theta = 2;\ \sin\theta = 0;\ \cos\theta = 1$
b. $2\cos\theta = 2;\ \sin\theta = 0;\ \cos\theta = 1$
c. $4\sin\theta = 2;\ \sin\theta = 0;\ \cos\theta = 1$
d. $2\cos\theta = 2;\ \sin\theta = 1;\ \cos\theta = 0$
e. $2\sin\theta = 2;\ \sin\theta = 0;\ \cos\theta = 1$

ANSWER: b

27. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$. Then find sin θ and cos θ.

$2 = \sqrt{16 - x^2},\ x = 4\sin\theta$

a. $16\sin\theta = 2;\ \sin\theta = \pm\frac{\sqrt{3}}{2};\ \cos\theta = \frac{1}{2}$

b. $16\cos\theta = 2;\ \sin\theta = \pm\frac{\sqrt{3}}{2};\ \cos\theta = \frac{1}{2}$

c. $4\sin\theta = 2;\ \sin\theta = \pm\frac{\sqrt{3}}{2};\ \cos\theta = \frac{1}{2}$

d. $4\cos\theta = 2;\ \sin\theta = \pm\frac{\sqrt{3}}{2};\ \cos\theta = \frac{1}{2}$

e. $4\cos\theta = 2;\ \sin\theta = \frac{1}{2};\ \cos\theta = \pm\frac{\sqrt{3}}{2}$

ANSWER: d

28. Use the trigonometric substitution to rewrite the algebraic expression as a trigonometric function of θ, where $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$. Then find sin θ and cos θ.

$2\sqrt{2} = \sqrt{16 - 4x^2},\ x = 2\cos\theta$

a. $|\sin\theta| = 2;\ \sin\theta = \frac{\sqrt{2}}{2};\ \cos\theta = \pm\frac{\sqrt{2}}{2}$

b. $2\sin\theta = 2;\ \sin\theta = 0;\ \cos\theta = 1$

c. $|\sin\theta| = \sqrt{2};\ \sin\theta = \pm\frac{\sqrt{2}}{2};\ \cos\theta = \frac{\sqrt{2}}{2}$

d. $4|\sin\theta| = 2\sqrt{2};\ \sin\theta = \pm\frac{\sqrt{2}}{2};\ \cos\theta = \frac{\sqrt{2}}{2}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

e. $2\cos\theta = 2;\ \sin\theta = 1;\ \cos\theta = 0$

ANSWER: d

29. Rewrite the expression as a single logarithm and simplify the result.

$\ln|\cot x| - \ln|\cos x|$

a. $\ln|\cot x|$
b. $\ln|\sin x|$
c. $\ln|\tan x|$
d. $\ln|\csc x|$
e. $\ln|\sec x|$

ANSWER: d

30. Rewrite the expression as a single logarithm and simplify the result.

$\ln|\sin x| + \ln|\cot x|$

a. $\ln|\tan x|$
b. $\ln|\csc x|$
c. $\ln|\sin x|$
d. $\ln|\cot x|$
e. $\ln|\cos x|$

ANSWER: e

31. Use a calculator to demonstrate the identity for the value of θ.

$\sin(-\theta) = -\sin\theta,\ \theta = 253^\circ$

a. $\sin(-253^\circ) = -\sin 253^\circ \approx 0.9563$
b. $\sin(-253^\circ) = -\sin 253^\circ \approx 0.9863$
c. $\sin(-253^\circ) = -\sin 253^\circ \approx 0.9763$
d. $\sin(-253^\circ) = -\sin 253^\circ \approx -0.9563$
e. $\sin(-253^\circ) = -\sin 253^\circ \approx -0.9763$

ANSWER: a

32. The forces acting on an object weighing W units on an inclined plane positioned at an angle of θ with the horizontal (see the figure) are modeled by

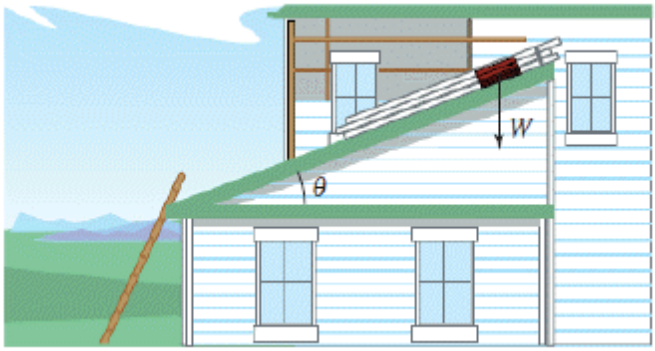
$\mu W \sin\theta = W\cos\theta$

where μ is the coefficient of friction. Solve the equation for μ and simplify the result.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities



a. $\mu = \cos\theta$
b. $\mu = \csc\theta$
c. $\mu = \sin\theta$
d. $\mu = \cot\theta$
e. $\mu = \tan\theta$

ANSWER: d

33. Find the rate of change of the function $f(x) = -x + \cos x$.

a. $-\sin x + 1$
b. $\sin x - 1$
c. $-\sin x - 1$
d. $-\sin x - x$
e. $\sin x + 1$

ANSWER: c

34. Find the rate of change of the function $f(x) = \sec x + \sin x$.

a. $\cos x + \tan x \sec x$
b. $-\cos^2 x$
c. $\cos x + 1$
d. $\cos x - \tan x \sec x$
e. $\cos x + \sec x$

ANSWER: a

35. Find the rate of change of the function $f(x) = -\csc x - \sin x$.

a. $\cos x + \sec x$
b. $\cos x + 1$
c. $\cos x - \tan x \sec x$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

d. $-\cos^2 x$

e. $\csc x \cot x - \cos x$

ANSWER: e

36. Use the trigonometric substitution $u = a \sin \theta$, where $0 < \theta < \pi/2$ and $a > 0$ to simplify the expression $\sqrt{a^2 - u^2}$.

a. $a \csc \theta$
b. $a \sin \theta$
c. $a \tan \theta$
d. $a \cos \theta$
e. $-a \cos \theta$

ANSWER: d

37. Use the trigonometric substitution $u = a \cot \theta$, where $0 < \theta < \pi/2$ and $a > 0$ to simplify the expression $\sqrt{a^2 + u^2}$.

a. $-a \csc \theta$
b. $a \csc \theta$
c. $a \cot \theta$
d. $a \cos \theta$
e. $a \sec \theta$

ANSWER: b

38. Use the trigonometric substitution $u = a \sec \theta$, where $0 < \theta < \pi/2$ and $a > 0$ to simplify the expression $\sqrt{u^2 - a^2}$.

a. $a \cot \theta$
b. $-a \tan \theta$
c. $a \sec \theta$
d. $a \sin \theta$
e. $a \tan \theta$

ANSWER: e

39. If $\sin x = \frac{1}{2}$ and $\cos x = \frac{\sqrt{3}}{2}$, evaluate the following function.

$\cot x$

a. $\cot x = \frac{2}{3}\sqrt{3}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

b. $\cot x = \frac{1}{3}\sqrt{3}$

c. $\cot x = 2$

d. $\cot x = \frac{1}{3}$

e. $\cot x = \sqrt{3}$

ANSWER: e

40. Use fundamental identities to simplify the expression below and then determine which of the following is *not* equivalent.

$\sin \alpha \, (\csc \alpha - \sin \alpha)$

a. $\frac{\csc^2 \alpha - \sec^2 \alpha + \tan^2 \alpha}{\csc^2 \alpha}$

b. $\cos^2 \alpha$

c. $\frac{\csc^2 \alpha - 1}{\csc^2 \alpha}$

d. $1 - \sin^2 \alpha$

e. $1 - \cot^2 \alpha$

ANSWER: e

41. Use fundamental identities to simplify the expression below and then determine which of the following is *not* equivalent.

$\sin\left(\frac{\pi}{2} - x\right) \csc x$

a. $\tan x$

b. $\cos x \csc x$

c. $\cot x$

d. $\frac{\cos x}{\sin x}$

e. $\frac{1}{\tan x}$

ANSWER: a

42. Factor; then use fundamental identities to simplify the expression below and determine which of the following is *not* equivalent.

$\tan^2 \alpha - \tan^2 \alpha \sin^2 \alpha$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

a. $\sin^2 \alpha$

b. $\cos^2\left(\frac{\pi}{2} - \alpha\right)$

c. $1 - \cos^2 \alpha$

d. $\tan^2 \alpha$

e. $\frac{1}{\csc^2 \alpha}$

ANSWER: d

43. Factor; then use fundamental identities to simplify the expression below and determine which of the following is *not* equivalent.

$\sin^3 x - \sin^2 x - \sin x + 1$

a. $\frac{1 + \cos^2 x}{\sin x}$

b. $\cos^2 x\ (1 - \sin x)$

c. $\frac{\cos^4 x}{1 + \sin x}$

d. $\cos^2 x - \cos^2 x \sin x$

e. $\frac{1 - \sin x}{\sec^2 x}$

ANSWER: a

44. Multiply; then use fundamental identities to simplify the expression below and determine which of the following is *not* equivalent.

$(\tan x + 1)^2$

a. $\tan^2 x + 1$

b. $\tan^2 x + \sec x(2\sin x + \cos x)$

c. $\tan^2 x + 2\tan x + 1$

d. $\sec^2 x(1 + 2\sin x \cos x)$

e. $\frac{1 + 2\sin x \cos x}{\cos^2 x}$

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities

45. Which of the following is equivalent to the given expression?

$$\frac{\sin^2 x}{1-\cos x}$$

a. $\cot x \sin x + \tan x$
b. $\csc x + \cot x$
c. $1 + \cos x$
d. $\tan x + \sin x$
e. $\cot x - \cos x$

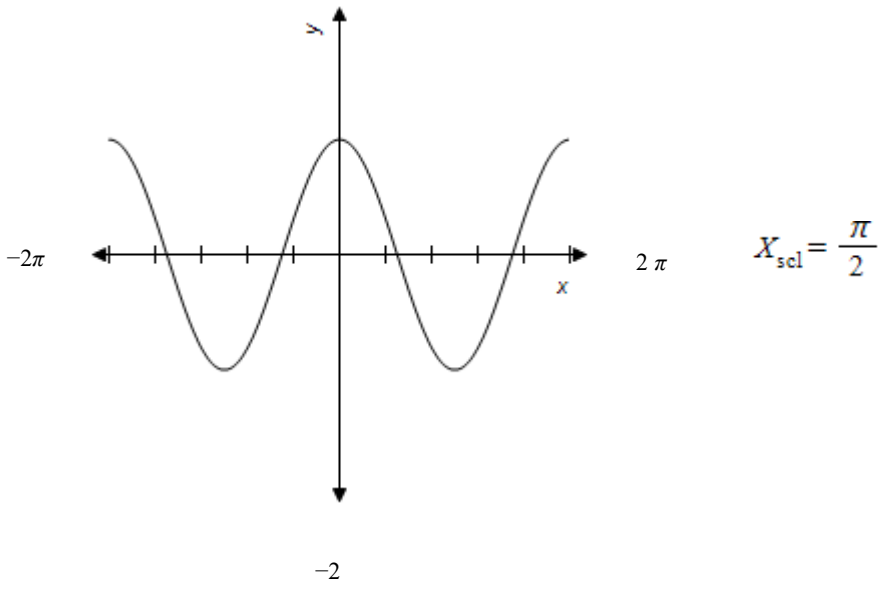
ANSWER: c

46. Use a graphing utility to determine which of the trigonometric functions is equal to the following expression.

$$\frac{\csc x - \sin x}{\cot x}$$

a.

$y = \cos x$



$X_{scl} = \frac{\pi}{2}$

b.

$y = \sin x$

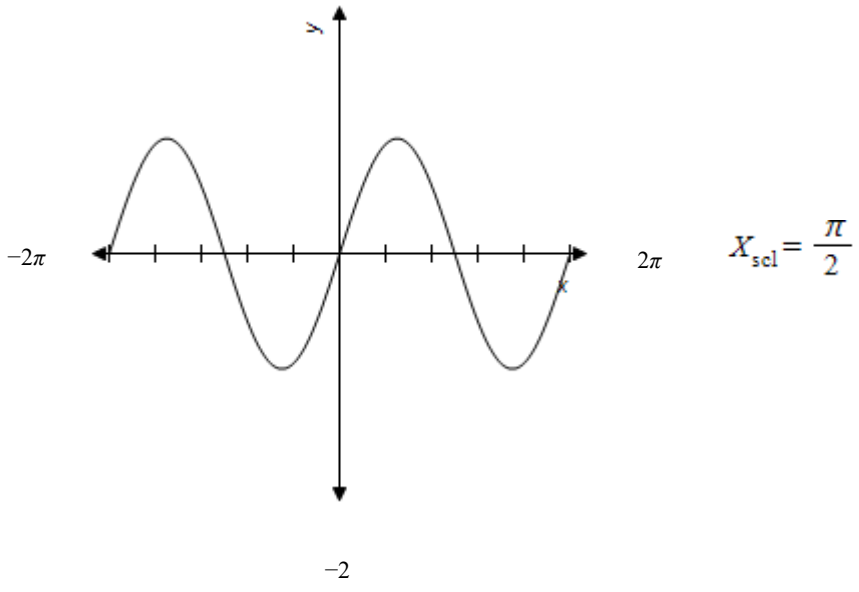
2

Copyright Cengage Learning. Powered by Cognero.

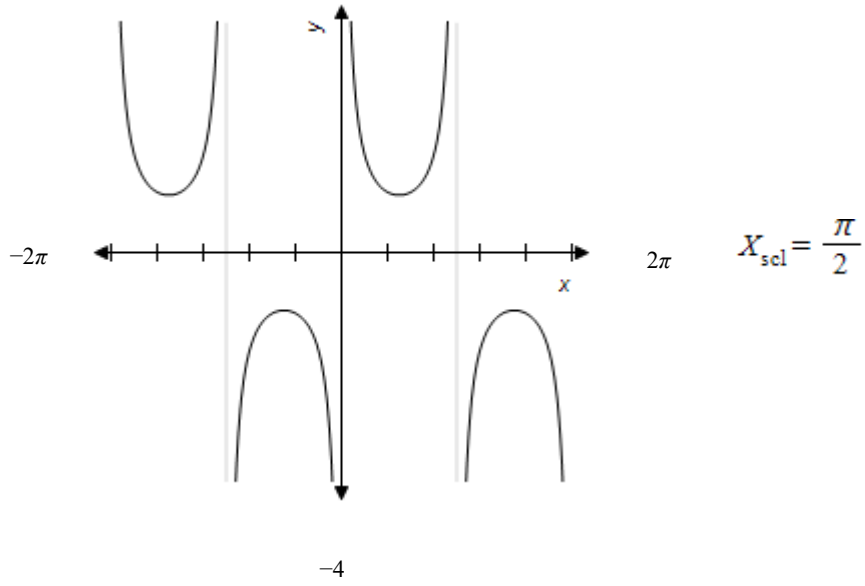
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 2.1 Using Fundamental Identities



c.
$y = \csc x$

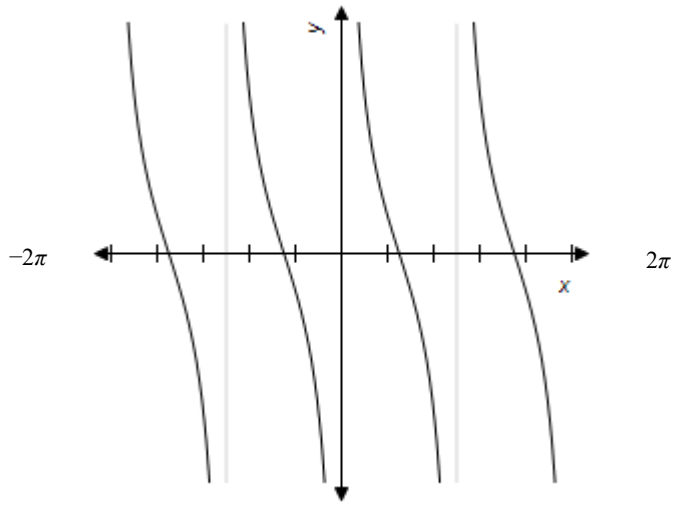


d.
$y = \cot x$

Copyright Cengage Learning. Powered by Cognero.

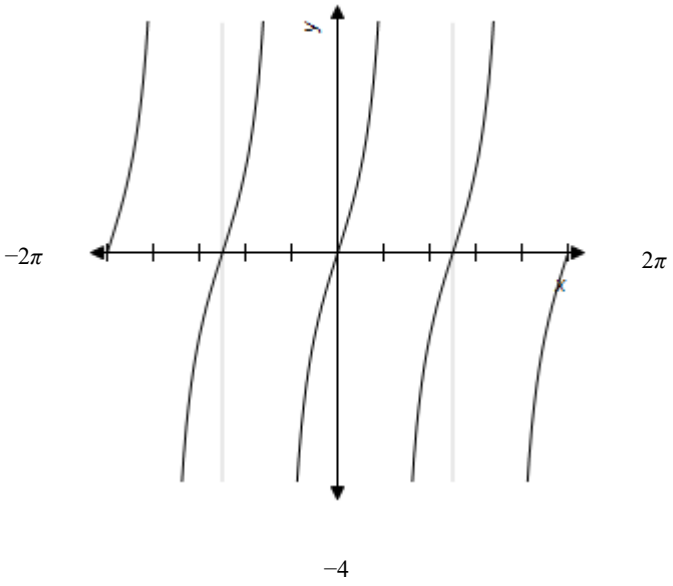
Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities



$X_{scl} = \frac{\pi}{2}$

e.
$y = \tan x$ 4



$X_{scl} = \frac{\pi}{2}$

ANSWER: a

47. If $x = 6 \cot \theta$, use trigonometric substitution to write $\sqrt{36 + x^2}$ as a trigonometric function of θ, where $0 < \theta < \pi$.

a. 6 sec θ
b. 6 csc θ
c. 6 cos θ
d. 6 sin θ

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

e. 6 cot θ

ANSWER: b

48. If $x = 2 \cot \theta$, use trigonometric substitution to write $\sqrt{4 + x^2}$ as a trigonometric function of θ, where $0 < \theta < \frac{\pi}{2}$.

a. 2 sin θ
b. 2 cot θ
c. 2 sec θ
d. 2 csc θ
e. 2 cos θ

ANSWER: d

49. If $x = 9 \tan \theta$, use trigonometric substitution to write $\sqrt{81 + x^2}$ as a trigonometric function of θ, where $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$.

a. 9 csc θ
b. 9 sec θ
c. 9 cos θ
d. 9 tan θ
e. 9 sin θ

ANSWER: b

50. Rewrite $\ln|\csc \theta| + \ln|\cos \theta|$ as a single logarithm and then simplify the result.

a. $\ln|\cos \theta|$
b. $\ln|\csc \theta|$
c. $\ln|\sec \theta|$
d. $\ln|\cot \theta|$
e. $\ln|\sin \theta|$

ANSWER: d

51. Use fundamental identities to simplify the expression below and then determine which of the following is *not* equivalent.

$\cos \alpha \, (\sec \alpha - \cos \alpha)$

a. $1 - \cos^2 \alpha$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

b. $\dfrac{\sec^2 \alpha - 1}{\sec^2 \alpha}$

c. $\dfrac{\sec^2 \alpha - \csc^2 \alpha + \cot^2 \alpha}{\sec^2 \alpha}$

d. $1 - \cot^2 \alpha$

e. $\sin^2 \alpha$

ANSWER: d

52. Use fundamental identities to simplify the expression below and then determine which of the following is *not* equivalent.

$\sin\left(\dfrac{\pi}{2} - x\right)\csc x$

a. –1

b. $\dfrac{\cos x}{\sin x}$

c. $\cot x$

d. $1/\ \tan x$

e. $\cos x \csc x$

ANSWER: a

53. Factor; then use fundamental identities to simplify the expression below and determine which of the following is *not* equivalent.

$-\sin^2 \alpha + \sin^2 \alpha \cdot \csc^2 \alpha$

a. $\cos^2 \alpha$

b. $1 - \sin^2 \alpha$

c. $\tan^2 \alpha$

d. $\sin^2\left(\dfrac{\pi}{2} - \alpha\right)$

e. $\dfrac{1}{\sec^2 \alpha}$

ANSWER: c

54. Factor; then use fundamental identities to simplify the expression below and determine which of the following is *not* equivalent.

$\cos^3 x - \cos^2 x - \cos x + 1$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

a. $\sin^2 x - \sin^2 x \cos x$

b. $\dfrac{1 - \cos x}{\csc^2 x}$

c. $\dfrac{\sin^4 x}{1 + \cos x}$

d. $\sin^2 x\ (1 - \cos x)$

e. $\dfrac{1 + \sin^2 x}{\cos x}$

ANSWER: e

55. Multiply; then use fundamental identities to simplify the expression below and determine which of the following is *not* equivalent.

$(\tan x + 1)^2$

a. $\tan^2 x + 1$

b. $\sec^2 x + 2\tan x$

c. $\dfrac{1 + 2\sin x \cos x}{\cos^2 x}$

d. $\tan^2 x + 2\tan x + 1$

e. $\sec^2 x\ (1 + 2\sin x \cos x)$

ANSWER: a

56. Which of the following is equivalent to the given expression?

$\dfrac{\sin^2 x}{1 - \cos x}$

a. $\tan x + \sin x$

b. $1 + \cos x$

c. $\csc x + \cot x$

d. $\cot x - \cos x$

e. $\cot x \sin x + \tan x$

ANSWER: b

57. If $x = 2 \cot \theta$, use trigonometric substitution to write $\sqrt{4 + x^2}$ as a trigonometric function of θ, where $0 < \theta < \dfrac{\pi}{2}$.

a. $2 \sec \theta$

b. $2 \sin \theta$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 2.1 Using Fundamental Identities

c. 2 cos θ
d. 2 csc θ
e. 2 cot θ

ANSWER: d

58. If $x = 2 \tan \theta$, use trigonometric substitution to write $\sqrt{4 + x^2}$ as a trigonometric function of θ, where $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$.

a. 2 csc θ
b. 2 sec θ
c. 2 tan θ
d. 2 sin θ
e. 2 cos θ

ANSWER: b

59. If $x = 9 \cos \theta$, use trigonometric substitution to write $\sqrt{81 - x^2}$ as a trigonometric function of θ, where $0 < \theta < \pi$.

a. 9 sec θ
b. 9 sin θ
c. 9 cot θ
d. 9 cos θ
e. 9 csc θ

ANSWER: b

60. Rewrite $\ln|\sec\theta| + \ln|\sin\theta|$ as a single logarithm and then simplify the result.

a. ln |sin θ|
b. ln |tan θ|
c. ln |cos θ|
d. ln |sec θ|
e. ln |csc θ|

ANSWER: b

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 3.1 Law of Sines

1. Use the Law of Sines to solve the triangle. Round your answer to two decimal places.

$A = 30°$, $B = 45°$, $c = 10$

a. $C = 105°$, $a \approx 6.18$, $b \approx 7.32$
b. $C = 105°$, $a \approx 7.32$, $b \approx 8.32$
c. $C = 105°$, $a \approx 8.18$, $b \approx 9.32$
d. $C = 105°$, $a \approx 5.18$, $b \approx 7.32$
e. $C = 105°$, $a \approx 7.18$, $b \approx 9.32$

ANSWER: d

2. Use the Law of Sines to solve the triangle. Round your answer to two decimal places.

$A = 120°$, $B = 40°$, $c = 12$

a. $C = 20°$, $a \approx 30.39$, $b \approx 22.55$
b. $C = 20°$, $a \approx 24.55$, $b \approx 31.39$
c. $C = 20°$, $a \approx 23.55$, $b \approx 22.55$
d. $C = 20°$, $a \approx 33.39$, $b \approx 22.55$
e. $C = 20°$, $a \approx 32.39$, $b \approx 24.55$

ANSWER: a

3. Use the Law of Sines to solve for B and C. Round your answer to two decimal places.

$A = 44°$, $a = 40$, $b = 25$

a. $B \approx 29°$, $C \approx 107°$
b. $B \approx 25.73°$, $C \approx 110.27°$
c. $B \approx 97°$, $C \approx 39°$
d. $B \approx 107°$, $C \approx 29°$
e. $B \approx 110.27°$, $C \approx 25.73°$

ANSWER: b

4. Use the Law of Sines to solve for C and B. Round your answer to two decimal places.

$A = 60°$, $a = 36$, $c = 40$

a. $C \approx 105.79°$, $B \approx 45.79°$
or
$C \approx 74.21°$, $B \approx 14.21°$
b. $C \approx 74.21°$, $B \approx 45.79°$
or
$C \approx 105.79°$, $B \approx 14.21°$
c. $C \approx 10°$, $B \approx 110°$
or
$C \approx 25.5°$, $B \approx 104.5°$
d. $C \approx 45.79°$, $B \approx 74.21°$
or

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

$C \approx 14.21°$, $B \approx 105.79°$

e. $C \approx 60°$, $B \approx 60°$
or
$C \approx 45°$, $B \approx 75°$

ANSWER: b

5. Use the Law of Sines to solve for B and C. Round your answer to two decimal places.

$A = 145°$, $a = 28$, $b = 8$

a. $B \approx 0.14°$, $C \approx 32.88°$
b. $B \approx 0.14°$, $C \approx 29.86°$
c. $B \approx 9.43°$, $C \approx 25.57°$
d. $B \approx 25.57°$, $C \approx 9.43°$
e. $B \approx 29.86°$, $C \approx 0.14°$

ANSWER: c

6. Use the Law of Sines to solve for b. Round your answers to two decimal places.

$A = 100°$, $a = 75$, $c = 6$

a. $b \approx 6$
b. $b \approx 75$
c. $b \approx 73.72$
d. $b \approx 72.72$
e. $b \approx 83.72$

ANSWER: c

7. Use the Law of Sines to solve (if possible) the triangle. If two solutions exist, find both. Round your answers to two decimal places.

$C = 63.44°$, $a = 37$, $c = 53$

a. $A \approx 77.92°$, $B \approx 38.64°$, $b \approx 57.94$
b. $A \approx 61.56°$, $B \approx 55°$, $b \approx 53$
c. $A \approx 38.64°$, $B \approx 77.92°$, $b \approx 57.94$
d. $A \approx 55°$, $B \approx 61.56°$, $b \approx 53$
e. No Solution

ANSWER: c

8. Use the Law of Sines to solve (if possible) for c. Round your answers to two decimal places.

$A = 110°$, $a = 125$, $b = 100$

a. $c \approx 38.23$
b. $c \approx 48.23$
c. $c \approx 58.23$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

d. $c \approx 68.23$
e. No solution

ANSWER: b

9. Use the Law of Sines to solve (if possible) for c. Round your answers to two decimal places.

$A = 110°$, $a = 75$, $b = 120$

a. $c \approx 84.40$
b. $c \approx 120$
c. $c \approx 75$
d. $c \approx 1.54$
e. No Solution

ANSWER: e

10. Use the Law of Sines to solve (if possible) for c. Round your answers to two decimal places.

$A = 76°$, $a = 18$, $b = 20$

a. $c \approx 48.23$
b. $c \approx 11.49$
c. $c \approx 40.06$
d. $c \approx 32.32$
e. No Solution

ANSWER: e

11. Use the Law of Sines to solve (if possible) the triangle. Round your answers to two decimal places.

$A = 76°$, $a = 5$, $b = 3$

a. $B \approx 35.6°$, $C \approx 35.6°$, $c \approx 6.49$
b. $B \approx 40.6°$, $C \approx 68.4°$, $c \approx 4.79$
c. $B \approx 35.6°$, $C \approx 68.4°$, $c \approx 4.79$
d. $B \approx 40.6°$, $C \approx 73.4°$, $c \approx 6.49$
e. No Solution

ANSWER: c

12. Use the Law of Sines to solve (if possible) the triangle. If two solutions exist, find both. Round your answers to two decimal places.

$A = 62°$, $a = 11.9$, $b = 10.5$

a. $B \approx 66.82°$, $C \approx 51.18°$, $c \approx 10.5$
b. $B \approx 89°$, $C \approx 29°$, $c \approx 12.39$
c. $B \approx 51.18°$, $C \approx 66.82°$, $c \approx 12.39$
d. $B \approx 29°$, $C \approx 89°$, $c \approx 11.9$
e. No Solution

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

ANSWER: c

13. Use the Law of Sines to solve (if possible) for c. Round your answers to two decimal places.

$A = 58°$, $a = 4.5$, $b = 12.8$

a. $c \approx 140.06$
b. $c \approx 40.06$
c. $c \approx 32.3$
d. $c \approx 4.06$
e. No Solution

ANSWER: e

14. Use the Law of Sines to solve (if possible) the triangle. Round your answers to two decimal places.

$A = 120°$, $a = b = 41$

a. $B \approx 98°$, $C \approx 41°$, $c \approx 44$
b. $B \approx 41°$, $C \approx 98°$, $c \approx 23.5$
c. $B \approx 100°$, $C \approx 39°$, $c \approx 23.5$
d. $B \approx 29°$, $C \approx 110°$, $c \approx 23.5$
e. No Solution

ANSWER: e

15. Use the Law of Sines to solve (if possible) the triangle. Round your answers to two decimal places.

$A = 133°$, $a = 16$, $b = 10$

a. $B \approx 8°$, $C \approx 39°$, $c \approx 8.41$
b. $B \approx 39°$, $C \approx 8°$, $c \approx 8.41$
c. $B \approx 27.20°$, $C \approx 19.80°$, $c \approx 7.41$
d. $B \approx 19.80°$, $C \approx 27.20°$, $c \approx 7.41$
e. No Solution

ANSWER: c

16. Find values for b such that the triangle has one solution.

$A = 32°$, $a = 3$

a. $b \leq 3, b \neq \dfrac{3}{\sin 32°}$
b. $b \geq 3, b \geq \dfrac{3}{\sin 32°}$
c. $b \geq 3, b = \dfrac{3}{\sin 32°}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

d. $b > 3, b > \frac{3}{\sin 32^\circ}$

e. $b \leq 3, b = \frac{3}{\sin 32^\circ}$

ANSWER: e

17. Find values for b such that the triangle has two solutions.

$A = 24^\circ, a = 4$

a. $4 \leq b \leq \frac{4}{\sin 24^\circ}$

b. $4 < b < \frac{4}{\sin 24^\circ}$

c. $4 < b \leq \frac{4}{\sin 24^\circ}$

d. $4 \geq b \geq \frac{4}{\sin 24^\circ}$

e. $4 > b > \frac{4}{\sin 24^\circ}$

ANSWER: b

18. Find values for b such that the triangle has no solutions.

$A = 36^\circ, a = 7$

a. $b > \frac{7}{\sin 36^\circ}$

b. $b \leq \frac{7}{\sin 36^\circ}$

c. $b = \frac{7}{\sin 36^\circ}$

d. $b \geq \frac{7}{\sin 36^\circ}$

e. $b < \frac{7}{\sin 36^\circ}$

ANSWER: a

19. Find values for b such that the triangle has one solution.

$A = 54^\circ, a = 14$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

a. $b \geq 14, b \geq \frac{14}{\sin 54^\circ}$

b. $b \geq 14, b = \frac{14}{\sin 54^\circ}$

c. $b \leq 14, b \neq \frac{14}{\sin 54^\circ}$

d. $b \leq 14, b = \frac{14}{\sin 54^\circ}$

e. $b > 14, b > \frac{14}{\sin 54^\circ}$

ANSWER: d

20. Find values for b such that the triangle has two solutions.

$A = 30°$, $a = 17$

a. $17 \geq b \geq \frac{17}{\sin 30^\circ}$

b. $17 \leq b \leq \frac{17}{\sin 30^\circ}$

c. $17 > b > \frac{17}{\sin 30^\circ}$

d. $17 < b \leq \frac{17}{\sin 30^\circ}$

e. $17 < b < \frac{17}{\sin 30^\circ}$

ANSWER: e

21. Find values for b such that the triangle has no solutions.

$A = 34°$, $a = 11$

a. $b < \frac{11}{\sin 34^\circ}$

b. $b \leq \frac{11}{\sin 34^\circ}$

c. $b = \frac{11}{\sin 34^\circ}$

d. $b \geq \frac{11}{\sin 34^\circ}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

e. $b > \dfrac{11}{\sin 34^\circ}$

ANSWER: e

22. Find values for b such that the triangle has one solution.

$A = 28^\circ$, $a = 18.4$

a. $b > 18.4,\ b > \dfrac{18.4}{\sin 28^\circ}$

b. $b \leq 18.4,\ b = \dfrac{18.4}{\sin 28^\circ}$

c. $b \leq 18.4,\ b \neq \dfrac{18.4}{\sin 28^\circ}$

d. $b \geq 18.4,\ b \geq \dfrac{18.4}{\sin 28^\circ}$

e. $b \geq 18.4,\ b = \dfrac{18.4}{\sin 28^\circ}$

ANSWER: b

23. Find values for b such that the triangle has two solutions.

$A = 26^\circ$, $a = 19.4$

a. $19.4 < b \leq \dfrac{19.4}{\sin 26^\circ}$

b. $19.4 < b < \dfrac{19.4}{\sin 26^\circ}$

c. $19.4 > b > \dfrac{19.4}{\sin 26^\circ}$

d. $19.4 \leq b \leq \dfrac{19.4}{\sin 26^\circ}$

e. $19.4 \geq b \geq \dfrac{19.4}{\sin 26^\circ}$

ANSWER: b

24. Find values for b such that the triangle has no solutions.

$A = 28^\circ$, $a = 9.6$

a. $b \leq \dfrac{9.6}{\sin 28^\circ}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

b. $b > \frac{9.6}{\sin 28^\circ}$

c. $b = \frac{9.6}{\sin 28^\circ}$

d. $b < \frac{9.6}{\sin 28^\circ}$

e. $b \geq \frac{9.6}{\sin 28^\circ}$

ANSWER: b

25. Find values for b such that the triangle has one solution.

$A = 86^\circ$, $a = 309.2$

a. $b \geq 309.2,\ b = \frac{309.2}{\sin 86^\circ}$

b. $b \leq 309.2,\ b \neq \frac{309.2}{\sin 86^\circ}$

c. $b > 309.2,\ b > \frac{309.2}{\sin 86^\circ}$

d. $b \leq 309.2,\ b = \frac{309.2}{\sin 86^\circ}$

e. $b \geq 309.2,\ b \geq \frac{309.2}{\sin 86^\circ}$

ANSWER: d

26. Find values for b such that the triangle has two solutions.

$A = 62^\circ$, $a = 325.2$

a. $325.2 < b \leq \frac{325.2}{\sin 62^\circ}$

b. $325.2 \geq b \geq \frac{325.2}{\sin 62^\circ}$

c. $325.2 > b > \frac{325.2}{\sin 62^\circ}$

d. $325.2 < b < \frac{325.2}{\sin 62^\circ}$

e. $325.2 \leq b \leq \frac{325.2}{\sin 62^\circ}$

ANSWER: d

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

27. Find values for b such that the triangle has no solutions.

$A = 78°$, $a = 339.4$

a. $b \leq \dfrac{339.4}{\sin 78°}$

b. $b = \dfrac{339.4}{\sin 78°}$

c. $b \geq \dfrac{339.4}{\sin 78°}$

d. $b < \dfrac{339.4}{\sin 78°}$

e. $b > \dfrac{339.4}{\sin 78°}$

ANSWER: e

28. Find the area of the triangle having the indicated angle and sides.

$C = 113°$, $a = 6$, $b = 6$

(Round your answer to one decimal place.)

a. 15.6
b. 16.6
c. 18.6
d. 17.6
e. 33.1

ANSWER: b

29. Find the area of the triangle having the indicated angle and sides.

$B = 126°$, $a = 64$, $c = 22$

(Round your answer to one decimal place.)

a. 568.5
b. 571.5
c. 1,139.1
d. 570.5
e. 569.5

ANSWER: e

30. Find the area of the triangle having the indicated angle and sides.

$A = 7°18'$, $b = 5$, $c = 20$

(Round your answer to one decimal place.)

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

a. 6.4
b. 5.4
c. 7.4
d. 8.4
e. 12.7

ANSWER: a

31. Find the area of the triangle having the indicated angle and sides.

$B = 73°20'$, $a = 62$, $c = 28$

(Round your answer to one decimal place.)

a. 832.5
b. 830.5
c. 833.5
d. 831.5
e. 1,663.1

ANSWER: d

32. Find the area of the triangle having the indicated angle and sides.

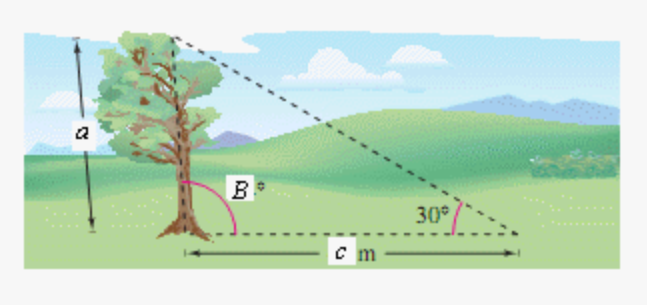
$C = 85°32'$, $a = 17$, $b = 24$

(Round your answer to one decimal place.)

a. 205.4
b. 203.4
c. 204.4
d. 202.4
e. 406.8

ANSWER: b

33. Because of prevailing winds, a tree grew so that it was leaning 7° from the vertical. At a point 41 meters from the tree, the angle of elevation to the top of the tree is 30° (see figure). Find the height a of the tree.



$c = 41$ m
$B = 97°$

(Round your answer to two decimal places.)

Copyright Cengage Learning. Powered by Cognero.

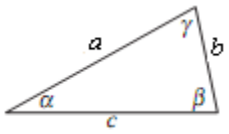
Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

a. 23.67 m
b. 25.67 m
c. 24.67 m
d. 27.67 m
e. 26.67 m

ANSWER: b

34. In the figure, α and β are positive angles.

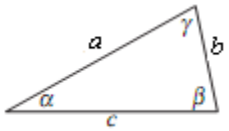


$a = 3$, $b = 9$
Write α as a function of β.

a. $\alpha = \arcsin(3\sin\beta)$
b. $\alpha = \sin(3\sin\beta)$
c. $\beta = \arcsin(3\sin\alpha)$
d. $\beta = \sin(3\sin\alpha)$
e. $\alpha = \arcsin(3\sin\beta)$

ANSWER: e

35. In the figure, α and β are positive angles.



$a = 15$, $b = 3$
Use $\alpha = \arcsin(0.2\sin\beta)$ to write c as a function of β.

a. $c = \dfrac{15\sin[\pi - \beta - \arcsin(0.2\sin\beta)]}{\sin\beta}$

b. $c = \dfrac{15\sin[\pi + \beta - \arcsin(0.2\sin\beta)]}{\sin\beta}$

c. $c = \dfrac{0.2\sin[\pi - \beta - \arcsin(15\sin\beta)]}{\sin\beta}$

d. $c = \dfrac{15\sin[\pi + \beta + \arcsin(0.2\sin\beta)]}{\sin\beta}$

e. $c = \dfrac{15\sin[\pi - \beta + \arcsin(0.2\sin\beta)]}{\sin\beta}$

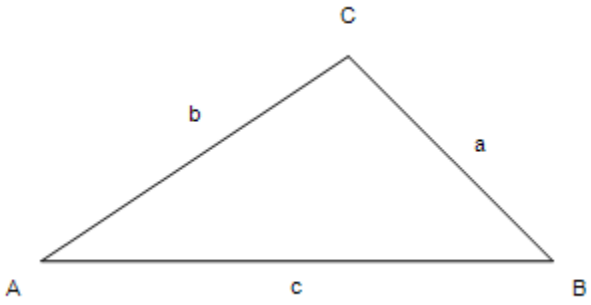
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

ANSWER: a

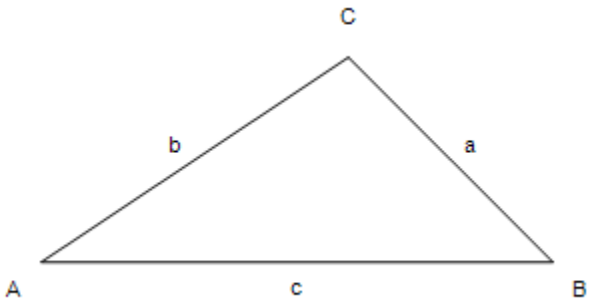
36. Given $A = 56°$, $B = 67°$, and $c = 8$, use the Law of Sines to solve the triangle for the value of a. Round your answer to two decimal places.



a. $a = 7.21$
b. $a = 7.91$
c. $a = 7.29$
d. $a = 8.88$
e. $a = 8.09$

ANSWER: b

37. Given $A = 50°$, $B = 75°$, and $a = 7.1$, use the Law of Sines to solve the triangle for the value of b. Round your answer to two decimal places.



a. $b = 6.64$
b. $b = 8.95$
c. $b = 6.02$
d. $b = 5.63$
e. $b = 7.59$

ANSWER: b

38. Given $C = 112°$, $B = 41°$, and $c = 15$, use the Law of Sines to solve the triangle for the value of a. Round your answer to two decimal places.

a. $a = 8.57$
b. $a = 10.38$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

c. $a = 6.12$
d. $a = 21.2$
e. $a = 7.34$

ANSWER: e

39. Given $A = 30°$, $B = 31°$, and $c = 15$, use the Law of Sines to solve the triangle for the value of b. Round your answer to two decimal places.

a. $b = 10.94$
b. $b = 9.51$
c. $b = 7.61$
d. $b = 10.06$
e. $b = 8.83$

ANSWER: e

40. Given $C = 127°$, $a = 14.9$, and $c = 10.3$, use the Law of Sines to solve the triangle (if possible) for the value of b. If two solutions exist, find both. Round your answer to two decimal places.

a. not possible
b. $b = 5.14$ and 9.46
c. $b = 7.58$
d. $b = 10.83$
e. $b = 4.21$ and 9.59

ANSWER: a

41. Given $C = 13°$, $a = 53.00$, and $c = 12$, use the Law of Sines to solve the triangle (if possible) for the value of b. If two solutions exist, find both. Round your answer to two decimal places.

a. $b = 39.28$ and 41.43
b. not possible
c. $b = 53.00$
d. $b = 42.09$
e. $b = 50.59$ and 42.73

ANSWER: c

42. Given $A = 12°$, $b = 9$, and $a = 7$, use the Law of Sines to solve the triangle (if possible) for the value of c. If two solutions exist, find both. Round your answer to two decimal places.

a. $c = 2.06$ and 15.55
b. $c = 13.20$
c. $c = 14.33$
d. not possible
e. $c = 1.08$ and 12.43

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

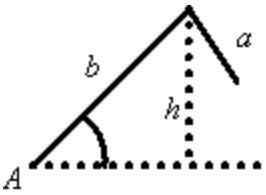
Section 3.1 Law of Sines

43. Select a value for b such that a triangle with $A = 59°$ and $a = 13$ has only one solution.

a. $b = 15$
b. $b = 16$
c. $b = 5$
d. $b = 14$
e. $b = 23$

ANSWER: c

44. Select a value for b such that a triangle with $A = 40°$ and $a = 5$ has no solution.



a. 1.95
b. 3.89
c. 7.68
d. 22.56
e. 1.56

ANSWER: d

45. Determine the area of a triangle having the following measurements. Round your answer to two decimal places.
$A = 124°$, $b = 7$, and $c = 15$

a. 43.52 sq. units
b. 52.23 sq. units
c. 47.88 sq. units
d. 39.17 sq. units
e. 34.82 sq. units

ANSWER: a

46. Determine the area of a triangle having the following measurements. Round your answer to two decimal places.
$B = 63°39'$, $a = 8$, and $c = 12$

a. 51.62 sq. units
b. 43.01 sq. units
c. 38.71 sq. units
d. 47.31 sq. units
e. 34.41 sq. units

ANSWER: b

47. Determine the area of a triangle having the following measurements. Round your answer to two decimal

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

places.
$C = 67°44'$, $a = 11$, and $b = 9.5$

a. 38.68 sq. units
b. 58.02 sq. units
c. 43.52 sq. units
d. 53.19 sq. units
e. 48.35 sq. units

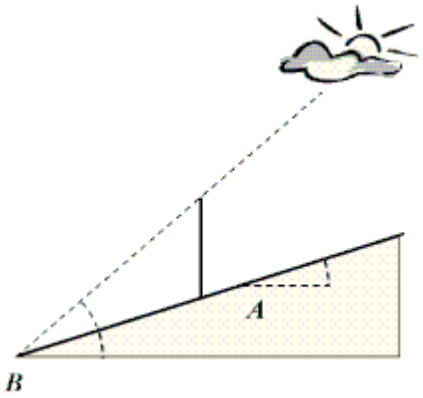
ANSWER: e

48. After a severe storm, three sisters, April, May, and June, stood on their front porch and noticed that the tree in their front yard was leaning 7° from vertical toward the house. From the porch, which is 97 feet away from the base of the tree, they noticed that the angle of elevation to the top of the tree was 30°. Approximate the height of the tree. Round answer to two decimal places.

a. 61.38 feet
b. 70.73 feet
c. 52.69 feet
d. 58.27 feet
e. 60.73 feet

ANSWER: c

49. A straight road makes an angle, A, of 13° with the horizontal. When the angle of elevation, B, of the sun is 60°, a vertical pole beside the road casts a shadow 8 feet long parallel to the road, see figure. Approximate the length of the pole. Round answer to two decimal places.



a. 3.60 feet
b. 11.70 feet
c. 5.47 feet
d. 13.86 feet
e. 6.76 feet

ANSWER: b

50. A park ranger at point A observes a fire in the direction N27°27'E. Another ranger at point B, 5 miles due

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

east of A, sites the same fire at N53°23'W. Determine the distance from point B to the fire. Round answer to two decimal places.

a. 2.33 miles
b. 4.49 miles
c. 2.56 miles
d. 4.46 miles
e. 4.07 miles

ANSWER: b

51. Given $C = 117°$, $B = 41°$, and $c = 15$, use the Law of Sines to solve the triangle for the value of a. Round answer to two decimal places.

a. $a = 20.37$
b. $a = 7.54$
c. $a = 8.56$
d. $a = 5.09$
e. $a = 6.31$

ANSWER: e

52. Given $A = 15^\circ$, $a = 9$, and $b = 11$,use the Law of Sines to solve the triangle (if possible) for the value of c. If two solutions exist, find both. Round answer to two decimal places.

a. $c = 16.81$
b. $c = 2.09$ and $c = 19.16$
c. $c = 17.94$
d. $c = 1.11$ and $c = 16.04$
e. not possible

ANSWER: b

53. Determine the area of a triangle having the following measurements. Round your answer to two decimal places.
$A = 121^\circ$, $b = 6$ and $c = 9$.

a. 27.77 sq. units
b. 23.14 sq. units
c. 18.51 sq. units
d. 20.83 sq. units
e. 25.46 sq. units

ANSWER: b

54. Determine the area of a triangle having the following measurements. Round your answer to two decimal places.
$C = 99^\circ$, $a = 10.5$ and $b = 11.0$

a. 57.04 sq. units

Copyright Cengage Learning. Powered by Cognero.

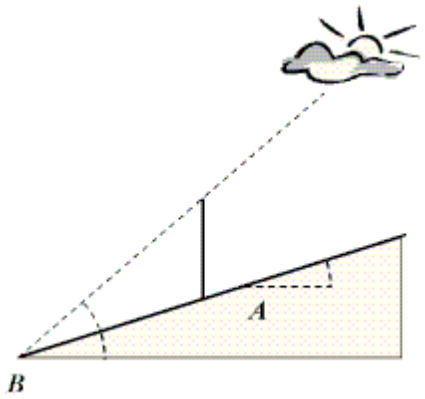
Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

b. 51.34 sq. units
c. 45.63 sq. units
d. 68.45 sq. units
e. 62.74 sq. units

ANSWER: a

55. A straight road makes an angle, A, of 19° with the horizontal. When the angle of elevation, B, of the sun is 60°, a vertical pole beside the road casts a shadow 8 feet long parallel to the road, see figure. Approximate the length of the pole. Round answer to two decimal places.



a. 5.21 feet
b. 6.10 feet
c. 10.50 feet
d. 13.86 feet
e. 6.06 feet

ANSWER: c

56. Determine the area of a triangle having the following measurements. Round your answer to two decimal places.
$A = 127^\circ$, $b = 7$ and $c = 11$.

a. 36.90 sq. units
b. 30.75 sq. units
c. 24.60 sq. units
d. 27.67 sq. units
e. 33.82 sq. units

ANSWER: b

57. Determine the area of a triangle having the following measurements. Round your answer to two decimal places.
$B = 59^\circ\ 35'$, $a = 7$ and $c = 8$.

a. 28.98 sq. units
b. 21.73 sq. units

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

c. 19.32 sq. units
d. 24.15 sq. units
e. 26.56 sq. units

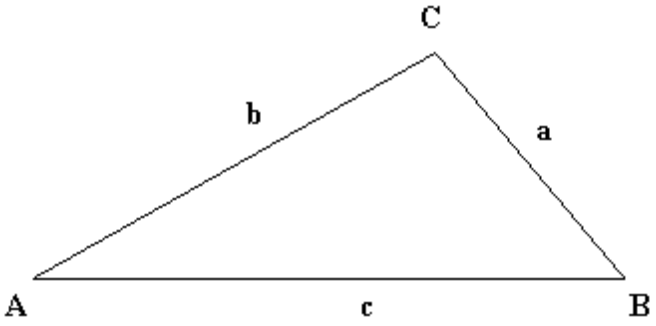
ANSWER: d

58. Given $A = 15^\circ$, $b = 12$, and $a = 10$, use the Law of Sines to solve the triangle (if possible) for the value of c. If two solutions exist, find both. Round answer to two decimal places.

a. $c = 18.75$
b. $c = 2.09$ and $c = 21.10$
c. $c = 19.88$
d. $c = 1.11$ and 17.98
e. not possible

ANSWER: b

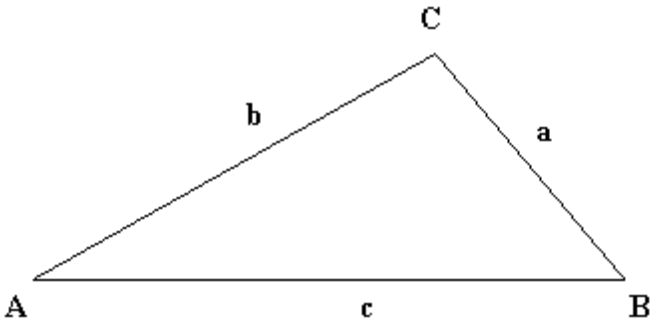
59. Given $A = 60^\circ$, $B = 65^\circ$, and $c = 8$, use the Law of Sines to solve the triangle for the value of a. Round answer to two decimal places.



a. a = 8.37
b. a = 7.64
c. a = 8.46
d. a = 7.57
e. a = 7.23

ANSWER: c

60. Given A = 57°, B = 75°, $a = 4.10$ and , use the Law of Sines to solve the triangle for the value of b. Round answer to two decimal places.



Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 3.1 Law of Sines

a. $b = 5.82$
b. $b = 3.42$
c. $b = 6.22$
d. $b = 4.72$
e. $b = 2.12$

ANSWER: d

61. Given $C = 71^\circ$, $a = 15.50$ and $c = 18$, use the Law of Sines to solve the triangle (if possible) for the value of b. If two solutions exist, find both. Round answer to two decimal places.

a. $b = 1.77$
b. $b = 6.46$ and 3.92
c. $b = 15.50$
d. $b = 13.08$ and 5.22
e. not possible

ANSWER: c

62. Given $C = 116^\circ$, $a = 19$, and $c = 18$, use the Law of Sines to solve the triangle (if possible) for the value of b. If two solutions exist, find both. Round answer to two decimal places.

a. $b = 8.29$
b. $b = 9.66$ and 19.86
c. $b = 3.97$
d. $b = 3.04$ and 6.41
e. not possible

ANSWER: e

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 4.1 Complex Numbers

1. Find real numbers a and b such that the equation is true.

$a+bi=-18+7i$

a. $a=-22, b=11$
b. $a=-20, b=9$
c. $a=-21, b=10$
d. $a=-19, b=8$
e. $a=-18, b=7$

ANSWER: e

2. Find real numbers a and b such that the equation is true.

$a+bi=14+10i$

a. $a=16, b=12$
b. $a=18, b=14$
c. $a=14, b=10$
d. $a=15, b=14$
e. $a=17, b=13$

ANSWER: c

3. Find real numbers a and b such that the equation is true.

$(a-2)+(b+4)i=6+10i$

a. $a=11,\ b=9$
b. $a=9,\ b=7$
c. $a=10,\ b=8$
d. $a=8,\ b=6$
e. $a=12,\ b=10$

ANSWER: d

4. Find real numbers a and b such that the equation is true.

$(a+15)+3bi=15-5i$

a. $a=0,\ b=-3$
b. $a=0,\ b=-\frac{5}{3}$
c. $a=0,\ b=-\frac{7}{3}$
d. $a=0,\ b=-2$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

e. $a = 0, b = -\frac{8}{3}$

ANSWER: b

5. Write the complex number in standard form.

$8+\sqrt{-16}$

a. $8+16i$
b. $11-7i$
c. $11+7i$
d. $8-4i$
e. $8+4i$

ANSWER: e

6. Write the complex number in standard form.

$5-\sqrt{-6}$

a. $5+\sqrt{6}i$
b. $6+\sqrt{6}i$
c. $9-\sqrt{6}i$
d. $5-\sqrt{6}i$
e. $6-\sqrt{6}i$

ANSWER: d

7. Write the complex number in standard form.

$\sqrt{-83}$

a. $2\sqrt{21}i$
b. $-\sqrt{86}i$
c. $\sqrt{83}i$
d. $\sqrt{86}i$
e. $-\sqrt{83}i$

ANSWER: c

8. Write the complex number in standard form.

$\sqrt{-49}$

a. $7i$
b. $-7i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

c. $49i$
d. $8i$
e. $-49i$

ANSWER: a

9. Write the complex number in standard form.

$-10i + i^2$

a. $-1 + 10i$
b. $-1 + 13i$
c. $1 + 10i$
d. $1 - 10i$
e. $-1 - 10i$

ANSWER: e

10. Write the complex number in standard form.

$\sqrt{-68.89}$

a. $68.89i$
b. $8.3i$
c. $11.3i$
d. $-8.3i$
e. $-68.89i$

ANSWER: b

11. Write the complex number in standard form.

$\sqrt{-0.0016}$

a. $-0.04i$
b. $-0.0016i$
c. $3.04i$
d. $0.04i$
e. $0.0016i$

ANSWER: d

12. Perform the addition or subtraction and write the result in standard form.

$(6 + i) + (8 - 8i)$

a. $18 - 11i$
b. $17 - 10i$
c. $14 - 7i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

d. $16 - 9i$
e. $15 - 8i$

ANSWER: c

13. Perform the addition or subtraction and write the result in standard form.

$(10-i)-(6-i)$

a. 4
b. 6
c. 8
d. 7
e. 5

ANSWER: a

14. Perform the addition or subtraction and write the result in standard form.

$17i-(14-8i)$

a. $14+25i$
b. $-14-25i$
c. $14-25i$
d. $-14+25i$
e. $-14+28i$

ANSWER: d

15. Perform the addition or subtraction and write the result in standard form.

$21+(-10+16i)+19i$

a. $11+35i$
b. $11-35i$
c. $-11-35i$
d. $-11+35i$
e. $11+37i$

ANSWER: a

16. Perform the addition or subtraction and write the result in standard form.

$(2.3+3.1i)+(-7.1+4.1i)$

a. $-4.8+8.2i$
b. $-4.8-8.2i$
c. $-4.8-7.2i$
d. $-4.8+7.2i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

e. $-4.8+9.2i$

ANSWER: d

17. Perform the operation and write the result in standard form.

$(1+i)(7-6i)$

a. $14+i$
b. $13+i$
c. $15+i$
d. $17+i$
e. $16+i$

ANSWER: b

18. Perform the operation and write the result in standard form.

$16i(1-8i)$

a. $129+16i$
b. $132+16i$
c. $130+16i$
d. $128+16i$
e. $131+16i$

ANSWER: d

19. Perform the operation and write the result in standard form.

$\left(\sqrt{15}+\sqrt{9}i\right)\left(\sqrt{15}-\sqrt{9}i\right)$

a. 28
b. 24
c. 25
d. 26
e. 27

ANSWER: b

20. Perform the operation and write the result in standard form.

$(6+7i)^2$

a. $-13+84i$
b. $-13-84i$
c. $13-84i$
d. $-84+13i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

e. $13+84i$

ANSWER: a

21. Perform the operation and write the result in standard form.

$(17-16i)^2$

a. $33-544i$
b. $-33-544i$
c. $33+544i$
d. $35-544i$
e. $-33+544i$

ANSWER: a

22. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$5+2i$

a. $5+2i, 29$
b. $5-2i, 4$
c. $5+2i, 4$
d. $-5-2i, 29$
e. $5-2i, 29$

ANSWER: e

23. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$5-7i$

a. $5+7i, 49$
b. $5-7i, 49$
c. $5-7i, 74$
d. $-5+7i, 49$
e. $5+7i, 74$

ANSWER: e

24. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$-11+\sqrt{10}i$

a. $-11-\sqrt{10}i, 131$
b. $11-\sqrt{10}i, 131$
c. $-11+\sqrt{10}i, 131$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

d. $11+\sqrt{10}i$, 131

e. $-10-\sqrt{11}i$, 131

ANSWER: a

25. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$-1-\sqrt{7}i$

a. $-1+\sqrt{7}i$, 100

b. $-1+\sqrt{7}i$, 8

c. $-1+\sqrt{7}i$, –6

d. $1-\sqrt{7}i$, 100

e. $1+\sqrt{7}i$, 8

ANSWER: b

26. Write the complex conjugate of the complex number. Then multiply the number by its complex conjugate.

$\sqrt{-35}$

a. $-34i$, 35

b. $\sqrt{35}i$, 35

c. $1225i$, 35

d. $-\sqrt{35}i$, 35

e. $-i$, 35

ANSWER: d

27. Write the quotient in standard form.

$\frac{2}{i}$

a. $-\frac{i}{2}$

b. $-\frac{2}{i}$

c. $-2i$

d. $\frac{i}{2}$

e. $2i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

ANSWER: c

28. Write the quotient in standard form.

$$-\frac{12}{3i}$$

a. $4i$
b. $\frac{4}{i}$
c. $-\frac{i}{4}$
d. $-4i$
e. $-\frac{4}{i}$

ANSWER: a

29. Write the quotient in standard form.

$$\frac{23}{1-i}$$

a. $\frac{23}{2+i}$
b. $\frac{23}{2}i$
c. $\frac{23}{2-i}$
d. $\frac{23}{2}+\frac{23}{2}i$
e. $\frac{23}{2}-\frac{23}{2}i$

ANSWER: d

30. Write the quotient in standard form.

$$\frac{2+i}{2-i}$$

a. $\frac{3}{5}-\frac{4}{5}i$
b. $\frac{3}{5}+\frac{5}{4}i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

c. $\frac{3}{5}+\frac{4}{5}i$

d. $\frac{5}{3}+\frac{5}{4}i$

e. $\frac{5}{3}+\frac{4}{5}i$

ANSWER: c

31. Write the quotient in standard form.

$$\frac{6-8i}{i}$$

a. $-6-8i$

b. $-8-6i$

c. $-8+6i$

d. $8-6i$

e. $8+6i$

ANSWER: b

32. Write the quotient in standard form.

$$\frac{8+18i}{4i}$$

a. $\frac{9}{2}-2i$

b. $\frac{9}{2}-\frac{9}{2}i$

c. $\frac{9}{2}+2i$

d. $\frac{9}{2}i-2$

e. $\frac{9}{2}i+2$

ANSWER: a

33. Perform the operation and write the result in standard form.

$$\frac{8}{1+i}-\frac{9}{1-i}$$

a. $-\frac{1}{2}+\frac{2}{17}i$

b. $-\frac{1}{2}-\frac{2}{17}i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

c. $-\frac{1}{2}+\frac{17}{2}i$

d. $\frac{17}{2}-\frac{1}{2}i$

e. $-\frac{1}{2}-\frac{17}{2}i$

ANSWER: e

34. Write the complex number in standard form.

$\sqrt{-3}\cdot\sqrt{-5}$

a. $-\sqrt{3}$

b. $\sqrt{5}$

c. $\sqrt{3}$

d. $-\sqrt{15}$

e. $\sqrt{15}$

ANSWER: d

35. Write the complex number in standard form.

$\sqrt{-32}\times\sqrt{-46}$

a. $8\sqrt{23}$

b. $-\sqrt{32}$

c. $-8\sqrt{23}$

d. $\sqrt{46}$

e. $\sqrt{32}$

ANSWER: c

36. Write the complex number in standard form.

$\left(\sqrt{-29}\right)^2$

a. $-\sqrt{29}$

b. -29

c. $\sqrt{48}$

d. 29

e. $\sqrt{29}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

ANSWER: b

37. Write the complex number in standard form.

$(5+\sqrt{-6})(4-\sqrt{-6})$

a. $(20-6)-(4\sqrt{6}-5\sqrt{6})i$
b. $(20+6)+(4\sqrt{6}-5\sqrt{6})i$
c. $(20-6)+(4\sqrt{6}-5\sqrt{6})i$
d. $(20+6)-(4\sqrt{6}-5\sqrt{6})i$
e. $(20+6)+(4\sqrt{6}+5\sqrt{6})i$

ANSWER: b

38. Write the complex number in standard form.

$\left(2-\sqrt{-15}\right)^2$

a. $-11+\sqrt{15}i$
b. $-11+4\sqrt{15}i$
c. $-11-\sqrt{15}i$
d. $-11-4\sqrt{15}i$
e. $4-15\sqrt{5}i$

ANSWER: d

39. Solve the equation and write complex solutions in standard form.

$x^2-16x+73=0$

a. $x=24+3i, 24-3i$
b. $x=3+8i, 3-8i$
c. $x=8+9i, 8-9i$
d. $x=8+3i, 8-3i$
e. $x=3+64i, 3-64i$

ANSWER: d

40. Solve the equation and write complex solutions in standard form.

$x^2-2x+8=0$

a. $x=1+\sqrt{7}i, 1-\sqrt{7}i$
b. $x=7+\sqrt{10}i, 7-\sqrt{10}i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

c. $x = 1 + \sqrt{10}i,\ 1 - \sqrt{10}i$

d. $x = 7 + \sqrt{7}i,\ 7 - \sqrt{7}i$

e. $x = 10 + \sqrt{7}i,\ 10 - \sqrt{7}i$

ANSWER: a

41. Simplify the complex number and write it in standard form.

$-6i^3 + i^2$

a. $1 + 6i$
b. $-1 - 6i$
c. $-6i$
d. $1 - 6i$
e. $-1 + 6i$

ANSWER: e

42. Simplify the complex number and write it in standard form.

$8i^2 - 9i^3$

a. $-9 + 8i$
b. $8 + 9i$
c. $-8 - 9i$
d. $-8 + 9i$
e. $8 - 9i$

ANSWER: d

43. Simplify the complex number and write it in standard form.

$-40i^5$

a. $-40i^3$
b. $40i^3$
c. $-40i$
d. -40
e. $40i$

ANSWER: c

44. Simplify the complex number and write it in standard form.

$\left(\sqrt{-30}\right)^3$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

a. $27{,}000i$
b. $-30i$
c. $-30\sqrt{30}i$
d. $30\sqrt{30}i$
e. $-27{,}000i$

ANSWER: c

45. Simplify the complex number and write it in standard form.

$$\frac{1}{i^3}$$

a. i^3
b. $-i^3$
c. 1
d. $-i$
e. i

ANSWER: e

46. Simplify the complex number and write it in standard form.

$$\frac{1}{(5i)^3}$$

a. $\frac{1}{5}i$
b. $-\frac{1}{125}i$
c. $\frac{1}{125}i$
d. $-\frac{1}{5}i$
e. $125i$

ANSWER: c

47. Simplify the complex number and write it in standard form.

$(10i)^4$

a. 10,000
b. –10,000
c. $10{,}000i$
d. $-10{,}000i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

e. $10i$

ANSWER: a

48. Simplify the complex number and write it in standard form.

$(-i)^7$

a. 1
b. i
c. –1
d. $-i$
e. 7

ANSWER: b

49. Raise the complex number to the fourth power.

$9i$

a. 6561
b. –729
c. 729
d. 81
e. –6561

ANSWER: a

50. Describe the error.

$\sqrt{-3}\sqrt{-3} = \sqrt{(-3)(-3)} = \sqrt{9} = 3$

a. $\sqrt{-3}\sqrt{-3} = \sqrt{3}\,i\sqrt{3}\,i = 3i = -3i$
b. $\sqrt{-3}\sqrt{-3} = \sqrt{3}\,i\sqrt{3}\,i = -9$
c. $\sqrt{-3}\sqrt{-3} = \sqrt{3}\,i\sqrt{3}\,i = 3i$
d. $\sqrt{-3}\sqrt{-3} = \sqrt{3}\,i\sqrt{3}\,i = 3i^2 = -3$
e. $\sqrt{-3}\sqrt{-3} = \sqrt{3}\,i\sqrt{3}\,i = 3i^2 = 3$

ANSWER: d

51. Do the operation and express the answer in $a + bi$ form.

$(2 - 7i) + (6 + 4i)$

a. $3 - 8i$
b. $-8 + 3i$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

c. $8 + 3i$
d. $-8 - 3i$
e. $8 - 3i$

ANSWER: e

52. Do the operation and express the answer in $a + bi$ form.

$$\left(10-\sqrt{-64}\right)-(4i-9)$$

a. $-19 + 24i$
b. $19 + 12i$
c. $-19 + 12i$
d. $-19 - 12i$
e. $19 - 12i$

ANSWER: e

53. Do the operation and express the answer in $a + bi$ form.

$$\left(2-\sqrt{-64}\right)+\left(5+\sqrt{-36}\right)$$

a. $7 - 2i$
b. $-14 - 4i$
c. $7 + 2i$
d. $-14 + 4i$
e. $-7 + 2i$

ANSWER: a

54. Do the operation and express the answer in $a + bi$ form.

$$\left(2+\sqrt{-25}\right)\left(2-\sqrt{-16}\right)$$

a. $24 - 2i$
b. $-24 + 2i$
c. $-2 + 2i$
d. $2 - 2i$
e. $24 + 2i$

ANSWER: e

55. Do the operation and express the answer in $a + bi$ form.

$$\frac{-3}{i^{20}}$$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 4.1 Complex Numbers

a. $3i$
b. $-3i$
c. $-30i$
d. -3
e. 3

ANSWER: d

56. Simplify the expression.

i^{-38}

a. i
b. $-3i$
c. $-i$
d. -1
e. 1

ANSWER: d

57. Do the operation and express the answer in $a + bi$ form.

$$\frac{17}{i^{35}}$$

a. $-17i$
b. $-85i$
c. -17
d. $17i$
e. 17

ANSWER: d

58. Find the values of x and y.

$x + 59i = y - yi$

$x =$ _____

$y =$ _____

ANSWER: -59; -59

59. Do the operation and express the answer in $a + bi$ form. Do not use parentheses in your answer.

$(9 - 7i) + (10 + 3i)$

ANSWER: $19 - 4i$

60. Do the operation and express the answer in $a + bi$ form. Use fractions in your answer.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 4.1 Complex Numbers

$$\frac{1}{6+i}$$

ANSWER: $\frac{6}{37} - \frac{i}{37}$

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

1. Evaluate the function at the indicated value of x. Round your result to three decimal places if necessary.

Function	*Value*
$f(x) = 0.5^x$	$x = 1.4$

a. -0.379
b. 1.4
c. 0.379
d. 0.5
e. -1.4

ANSWER: c

2. Evaluate the function at the indicated value of x. Round your result to three decimal places.

Function	*Value*
$f(x) = 5^x$	$x = -\pi$

a. 1.506
b. 0.006
c. 0.506
d. 0.114
e. 2.006

ANSWER: b

3. Evaluate the function at the indicated value of x. Round your result to three decimal places.

Function	*Value*
$f(x) = 3000(5^x)$	$x = -1.1$

a. 510.804
b. 102.718
c. -510.804
d. 610.804
e. -102.718

ANSWER: a

4. Evaluate the function at the indicated value of x. Give your answer in scientific notation to three decimal places if necessary.

Function	*Value*
$f(x) = 100(1.3)^{12x}$	$x = 13$

Copyright Cengage Learning. Powered by Cognero.

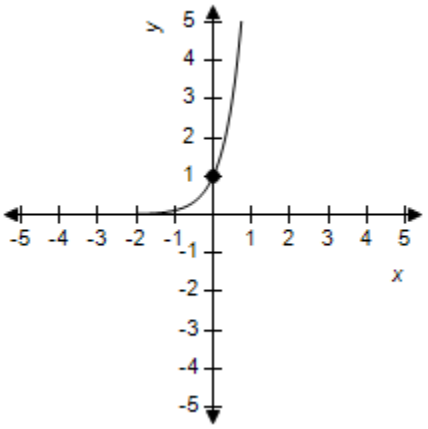
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

a. 1.274×10^{2}
b. 2.028×10^{4}
c. 1.524×10^{36}
d. 7.692×10^{1}
e. 5.959×10^{19}

ANSWER: e

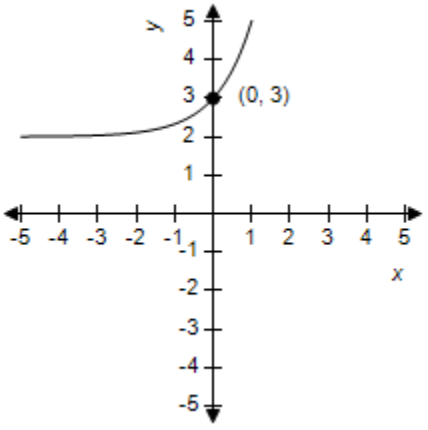
5. Match the graph with its exponential function.



a. $y = 9^{x}$
b. $y = -9^{-x}$
c. $y = -9^{x}$
d. $y = 9^{-x}$
e. $y = 9x$

ANSWER: a

6. Match the graph with its exponential function.



Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

a. $y = 3^{-x} - 2$

b. $y = -3^{x} + 2$

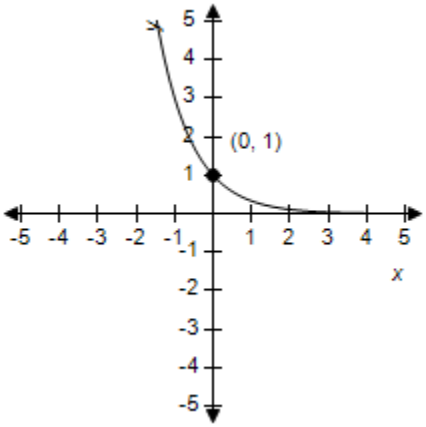
c. $y = 3^{x} + 2$

d. $y = 3^{x} - 2$

e. $y = -3^{x} - 2$

ANSWER: c

7. Match the graph with its exponential function.



a. $y = 3x$

b. $y = -3^{-x}$

c. $y = -3^{x}$

d. $y = 3^{x}$

e. $y = 3^{-x}$

ANSWER: e

8. Use a graphing utility to construct a table of values for the function. Round your answer to two decimal places.

$$f(x) = \left(\frac{1}{6}\right)^{x}$$

a.

x	-2	-1	0	1	2
$f(x)$	36.00	−6.00	1.00	0.17	0.03

b.

x	-2	-1	0	1	2

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

$f(x)$	36.00	6.00	−1.00	0.17	0.03

c.

x	-2	-1	0	1	2
$f(x)$	−36.00	6.00	1.00	0.17	0.03

d.

x	-2	-1	0	1	2
$f(x)$	36.00	6.00	1.00	0.17	0.03

e.

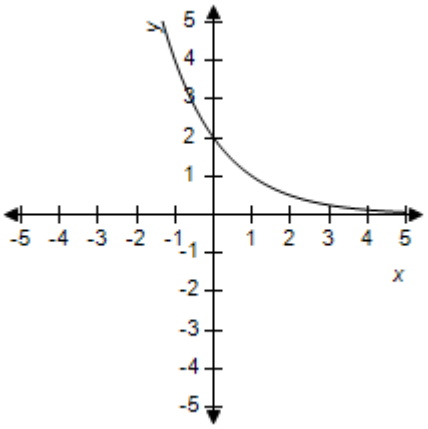
x	-2	-1	0	1	2
$f(x)$	36.00	6.00	1.00	−0.17	−0.03

ANSWER: d

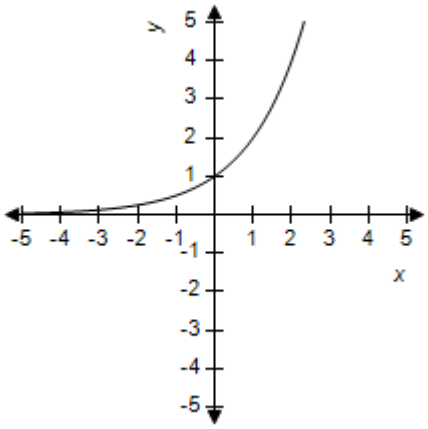
9. Select the graph of the function.

$$f(x)=\left(\frac{1}{2}\right)^{-x}$$

a.



b.



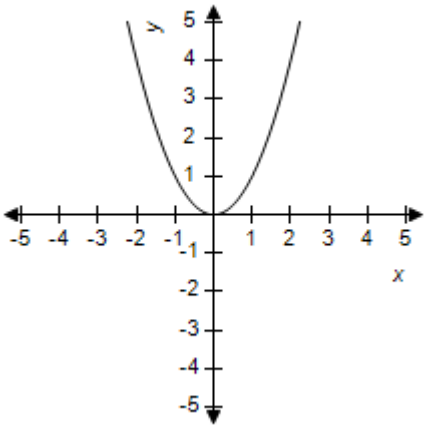
c.

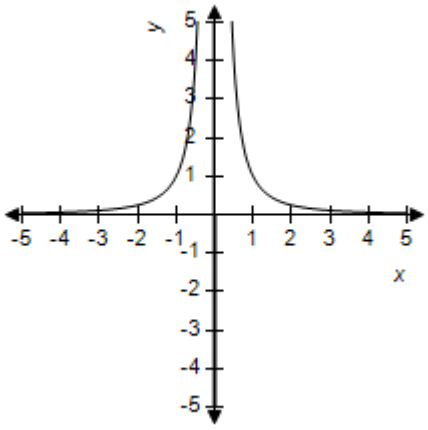
d.

Copyright Cengage Learning. Powered by Cognero.

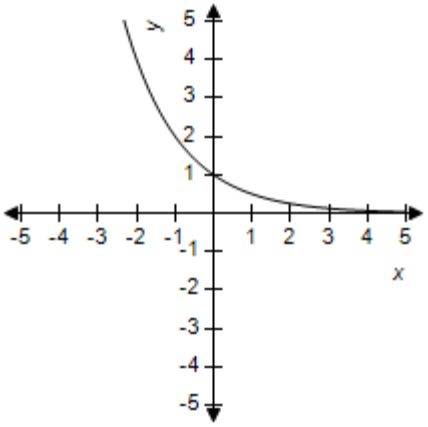
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs





e.



ANSWER: b

10. Use a graphing utility to construct a table of values for the function. Round your answers to two decimal places.

$f(x) = 2^{-x}$

a.

x	-2	-1	0	1	2
$f(x)$	4.00	2.00	1.00	0.50	-0.25

b.

x	-2	-1	0	1	2
$f(x)$	-4.00	2.00	1.00	0.50	0.25

c.

x	-2	-1	0	1	2
$f(x)$	4.00	-2.00	1.00	0.50	0.25

d.

x	-2	-1	0	1	2
$f(x)$	4.00	2.00	1.00	-0.50	0.25

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

e.

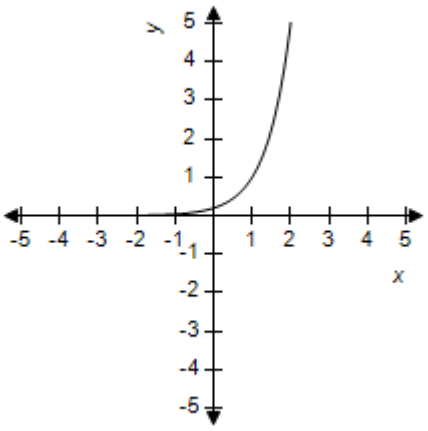
x	-2	-1	0	1	2
$f(x)$	4.00	2.00	1.00	0.50	0.25

ANSWER: e

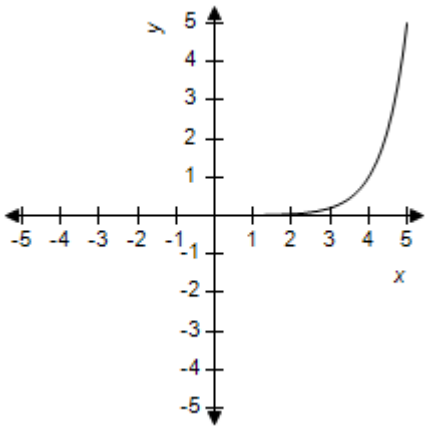
11. Select the graph of the function.

$f(x) = 5^{x-1}$

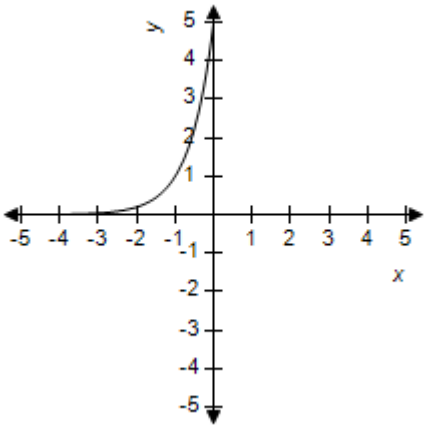
a.



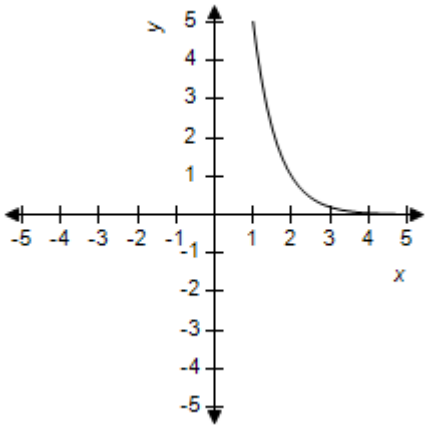
b.



c.



d.

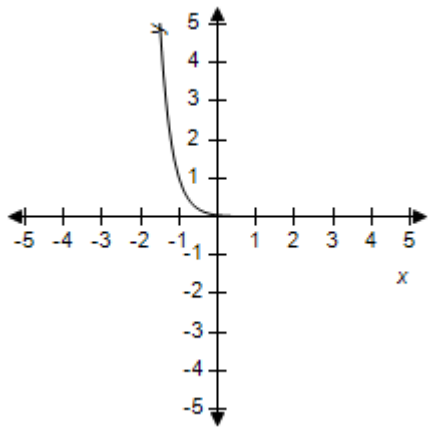


e.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs



ANSWER: a

12. Use a graphing utility to construct a table of values for the function. Round your answers to two decimal places.

$f(x) = 4^{x-3} + 1$

a.

x	-2	-1	0	1	2
$f(x)$	1.00	1.00	1.02	1.06	1.25

b.

x	-2	-1	0	1	2
$f(x)$	1.00	1.00	-1.02	1.06	1.25

c.

x	-2	-1	0	1	2
$f(x)$	1.00	-1.00	1.02	1.06	1.25

d.

x	-2	-1	0	1	2
$f(x)$	1.00	1.00	1.02	-1.06	-1.25

e.

x	-2	-1	0	1	2
$f(x)$	-1.00	1.00	1.02	1.06	1.25

ANSWER: a

13. Use the graph of f to determine the transformation that yields the graph of g.

$f(x) = 6^x, g(x) = 6^x + 11$

a. Shift the graph of f eleven units to the left.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

b. Shift the graph of f eleven units upward.
c. Shift the graph of f eleven units to the right.
d. Shift the graph of f eleven units downward.
e. Both the graphs f and g are same.

ANSWER: b

14. Use the graph of f to determine the transformation that yields the graph of g.

$f(x) = 2^x,\ g(x) = 5 - 2^x$

a. Reflect the graph of f in the x-axis and shift five units downward.
b. Both the graphs f and g are same.
c. Reflect the graph of f in the y-axis and shift five units upward.
d. Reflect the graph of f in the x-axis and shift five units upward.
e. Reflect the graph of f in the y-axis and shift five units downward.

ANSWER: d

15. Use the graph of f to determine the transformation that yields the graph of g.

$f(x) = \left(\frac{9}{2}\right)^x,\ g(x) = -\left(\frac{9}{2}\right)^{-x}$

a. Reflect the graph of f in the x-axis.
b. Shift the graph of f two units upward.
c. Reflect the graph of f in the origin.
d. Shift the graph of f two units downward.
e. Reflect the graph of f in the y-axis.

ANSWER: c

16. Select the graph of the exponential function.

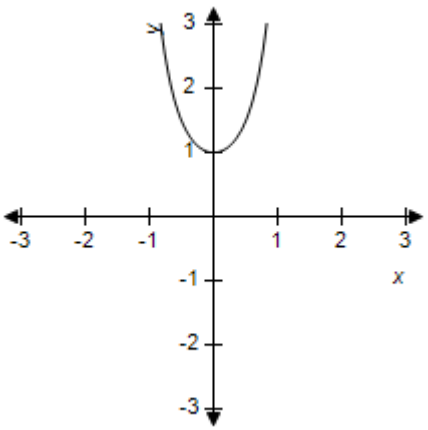
$f(x) = 5^{-x^2}$

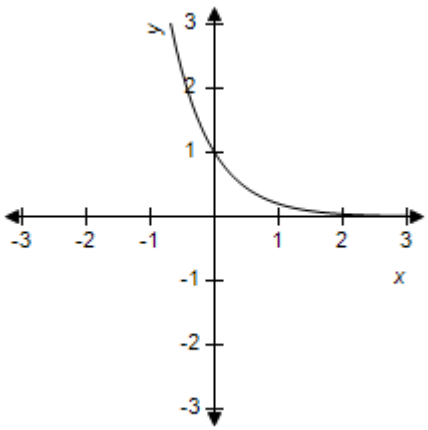
a. b.

Copyright Cengage Learning. Powered by Cognero.

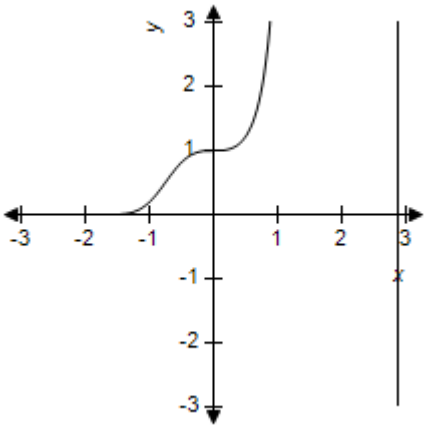
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

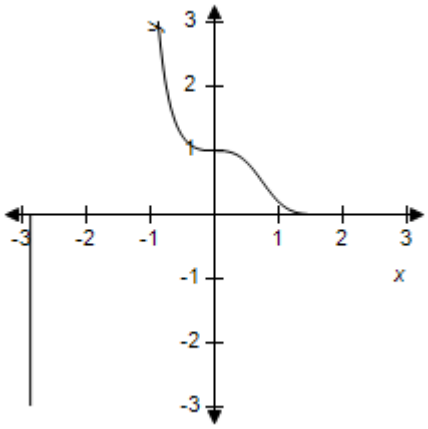




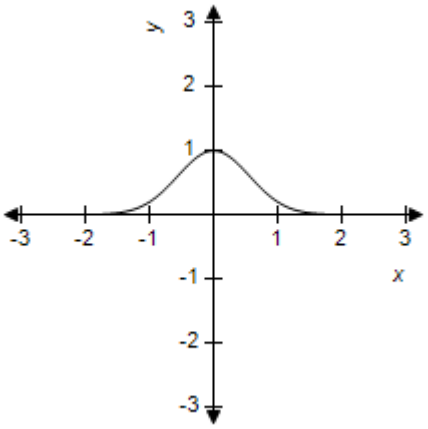
c.



d.



e.



ANSWER: e

17. Select the graph of the exponential function.

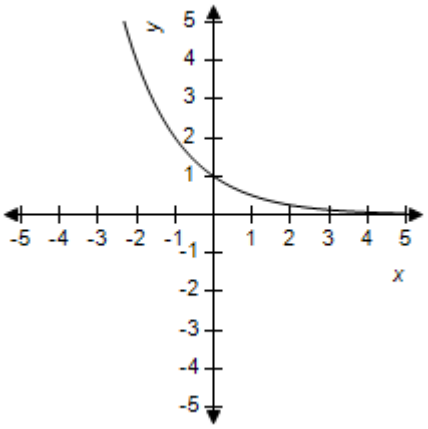
$f(x) = 2^{-|x|}$

Copyright Cengage Learning. Powered by Cognero.

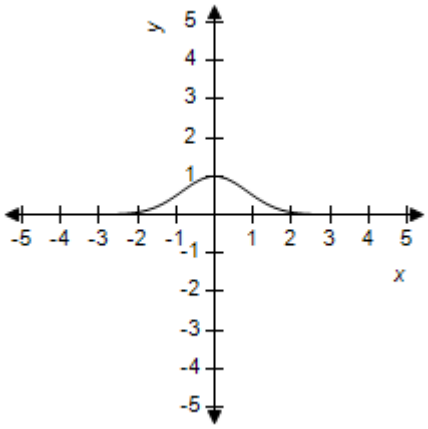
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

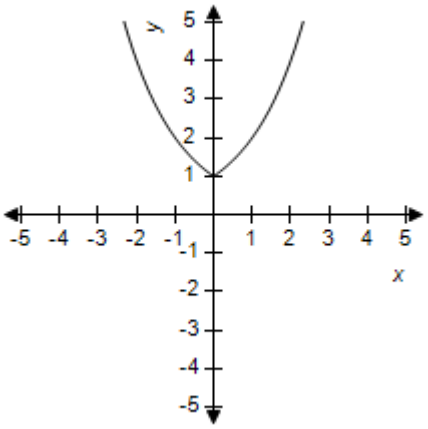
a.



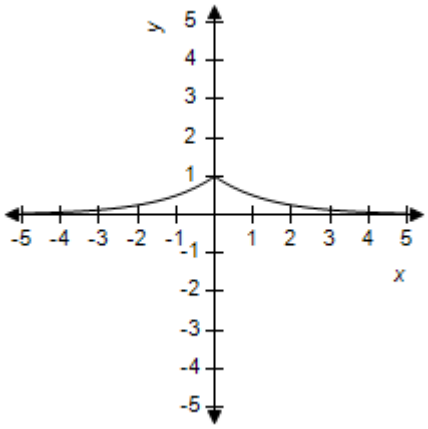
b.



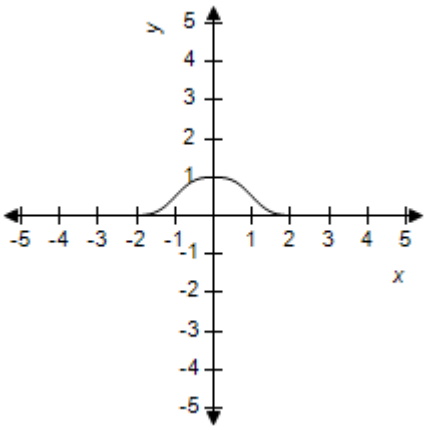
c.



d.



e.



ANSWER: d

18. Select the graph of the exponential function.

Copyright Cengage Learning. Powered by Cognero.

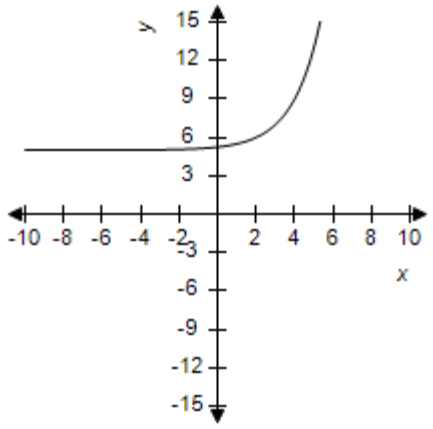
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

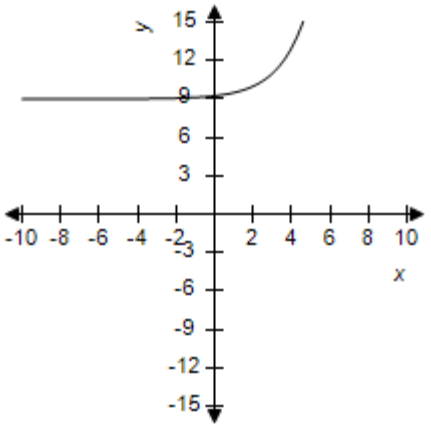
Section 5.1 Exponential Functions and Their Graphs

$f(x) = 2^{x-2}+5$

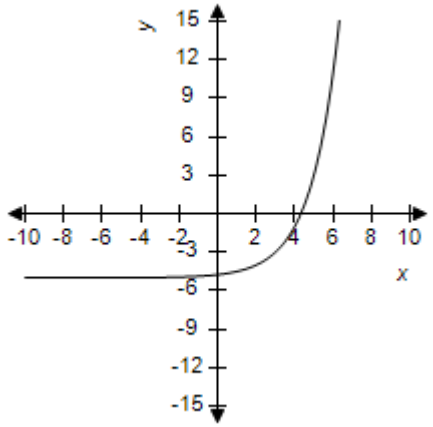
a.



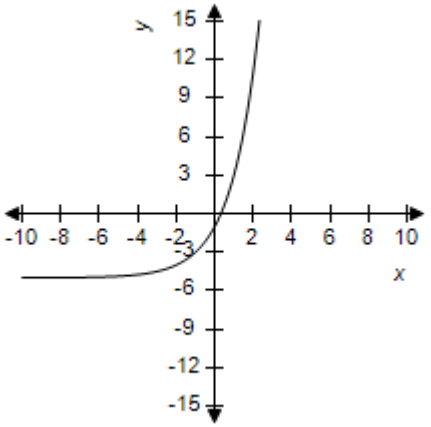
b.



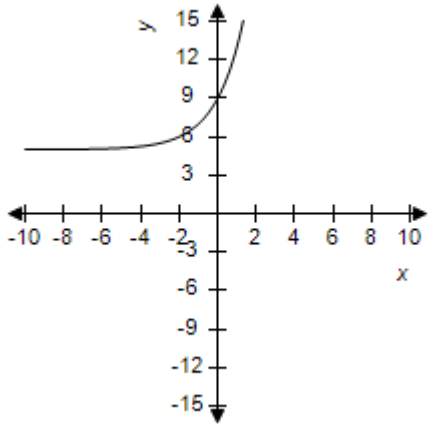
c.



d.



e.



ANSWER: a

19. Select the graph of the exponential function.

Copyright Cengage Learning. Powered by Cognero.

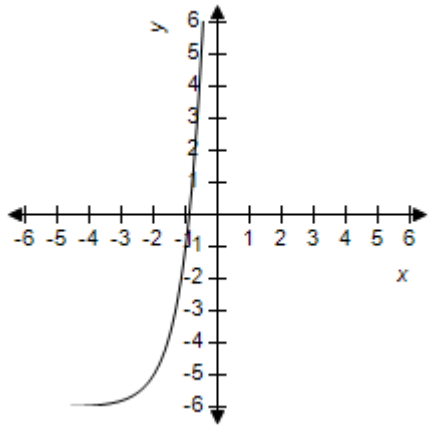
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

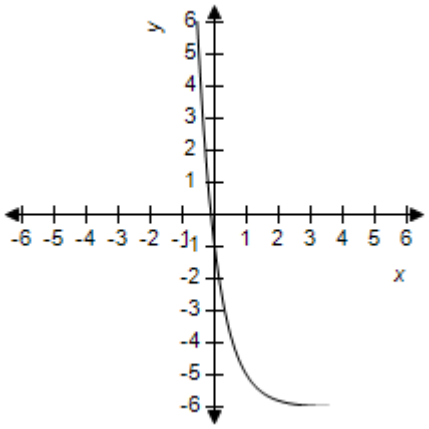
Section 5.1 Exponential Functions and Their Graphs

$f(x) = 5^{x+1} - 6$

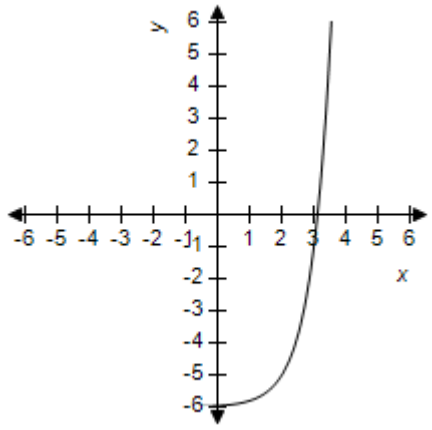
a.



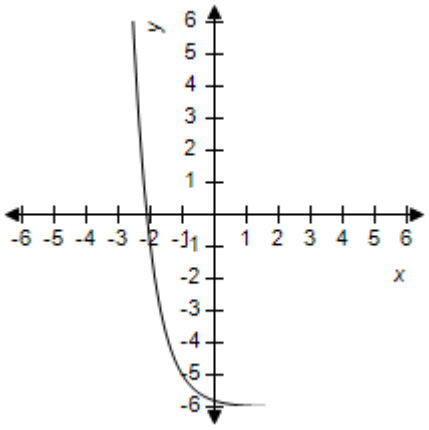
b.



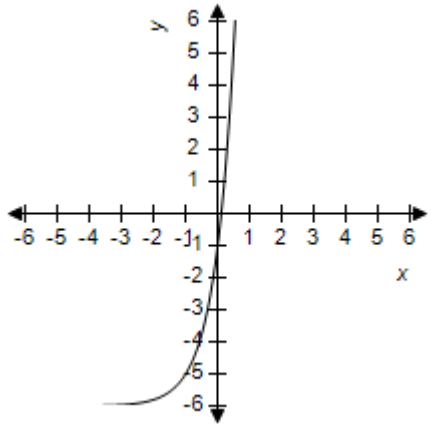
c.



d.



e.



ANSWER: e

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

20. Evaluate the function at the indicated value of x. Round your result to three decimal places.

Function	*Value*
$h(x) = e^{-x}$	$x = \frac{9}{8}$

a. 8.070
b. 1.125
c. 1.648
d. 9.500
e. 0.325

ANSWER: e

21. Evaluate the function at the indicated value of x. Round the result to three decimal places.

Function	*Value*
$h(x) = 5000e^{0.06x}$	$x = 4$

a. 6556.246
b. 6456.246
c. 6406.246
d. 6706.246
e. 6356.246

ANSWER: e

22. Evaluate the function at the indicated value of x. Round your result to three decimal places.

Function	*Value*
$h(x) = 500e^{0.05x}$	$x = 16$

a. 1112.770
b. 1312.770
c. 1512.770
d. 1212.770
e. 1412.770

ANSWER: a

23. Use a graphing utility to construct a table of values for the function. Round your answers to three decimal places.

$f(x) = e^{4x}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

a.

x	-2	-1	0	1	2
$f(x)$	0.000	0.018	-1.000	54.598	2,980.958

b.

x	-2	-1	0	1	2
$f(x)$	0.000	0.018	1.000	-54.598	2,980.958

c.

x	-2	-1	0	1	2
$f(x)$	0.000	0.018	1.000	54.598	2,980.958

d.

x	-2	-1	0	1	2
$f(x)$	0.000	-0.018	1.000	54.598	2,980.958

e.

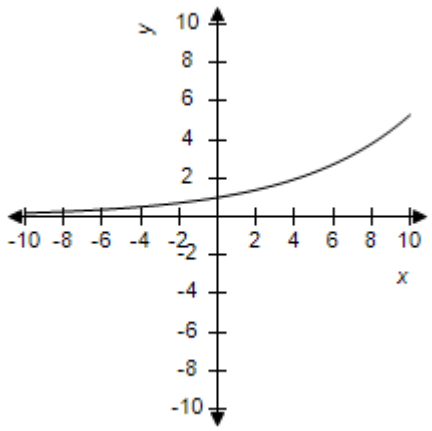
x	-2	-1	0	1	2
$f(x)$	0.000	-0.018	-1.000	-54.598	-2,980.958

ANSWER: c

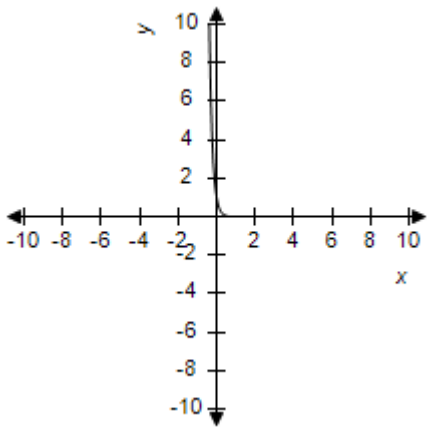
24. Select the graph of the function.

$f(x) = e^{6x}$

a.



b.



c.

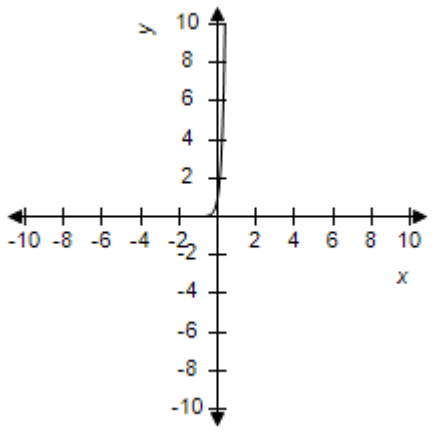
d.

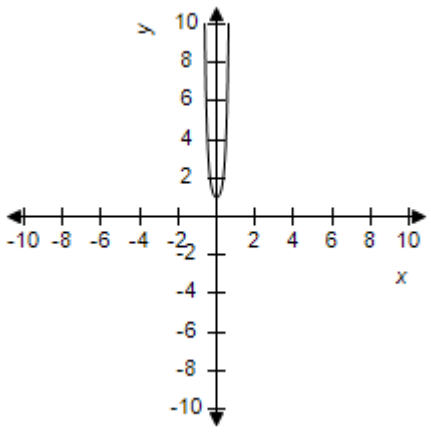
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

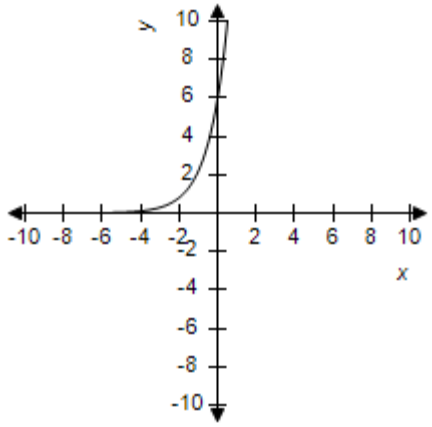
Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs





e.



ANSWER: c

25. Use a graphing utility to construct a table of values for the function. Round your answers to three decimal places.

$f(x) = 5e^{x+6}$

a.

x	-2	-1	0	1	2
$f(x)$	272.991	742.066	0	5,483.166	14,904.790

b.

x	-2	-1	0	1	2
$f(x)$	272.991	−742.066	2,017.144	5,483.166	14,904.790

c.

x	-2	-1	0	1	2
$f(x)$	272.991	742.066	2,017.144	5,483.166	14,904.790

d.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

x	-2	-1	0	1	2
$f(x)$	−272.991	742.066	2,017.144	5,483.166	14,904.790

e.

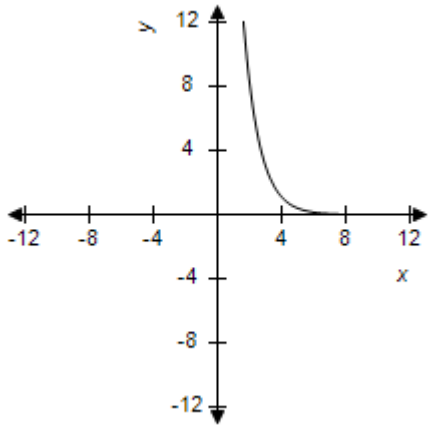
x	-2	-1	0	1	2
$f(x)$	−272.991	−742.066	2,017.144	5,483.166	14,904.790

ANSWER: c

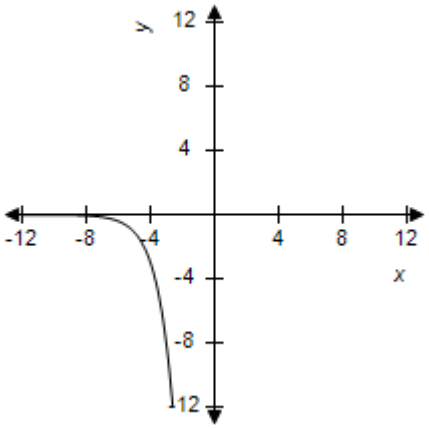
26. Select the graph of the function.

$f(x) = 3e^{x+4}$

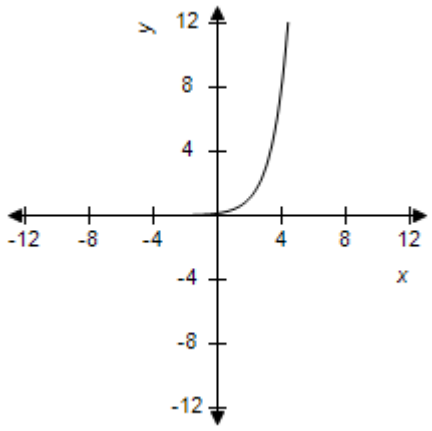
a.



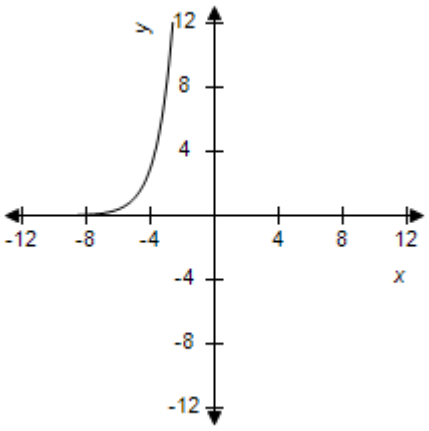
b.



c.



d.



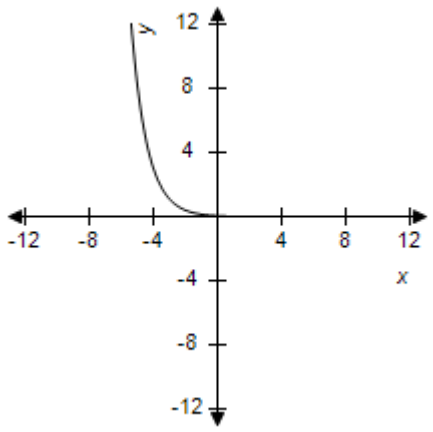
e.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs



ANSWER: d

27. Use a graphing utility to construct a table of values for the function. Round your answers to three decimal places.

$f(x) = 5e^{x-2}+6$

a.

x	-2	-1	0	1	2
$f(x)$	−6.092	−6.249	6.677	7.839	11

b.

x	-2	-1	0	1	2
$f(x)$	6.092	6.249	6.677	−7.839	−11

c.

x	-2	-1	0	1	2
$f(x)$	6.092	6.249	−6.677	7.839	11

d.

x	-2	-1	0	1	2
$f(x)$	6.092	6.249	6.677	7.839	11

e.

x	-2	-1	0	1	2
$f(x)$	6.092	−6.249	6.677	7.839	11

ANSWER: d

28. Select the graph of the function.

$f(x) = 6e^{x-2}+7$

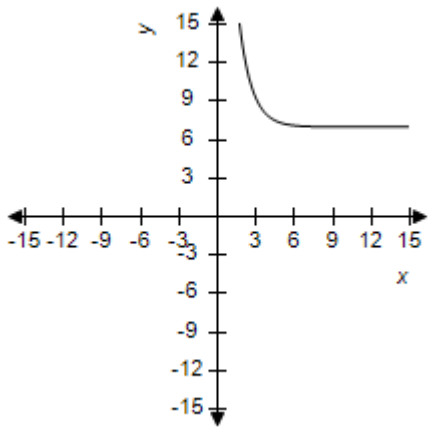
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

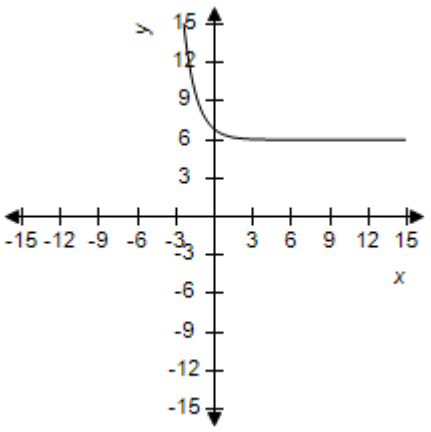
Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

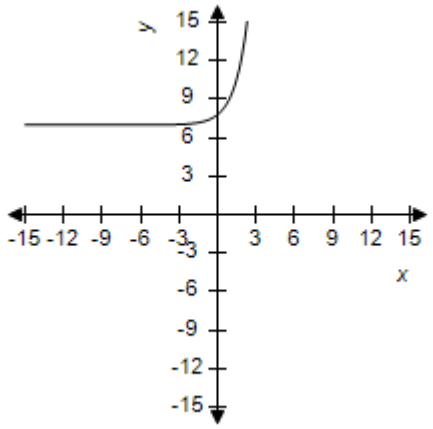
a.



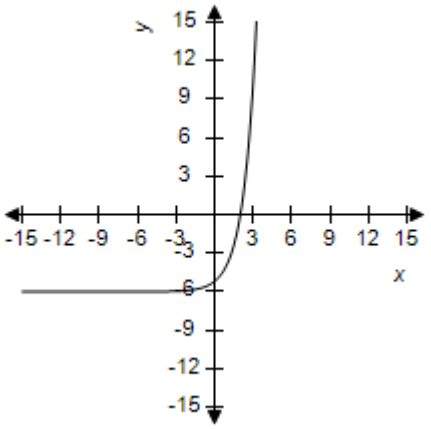
b.



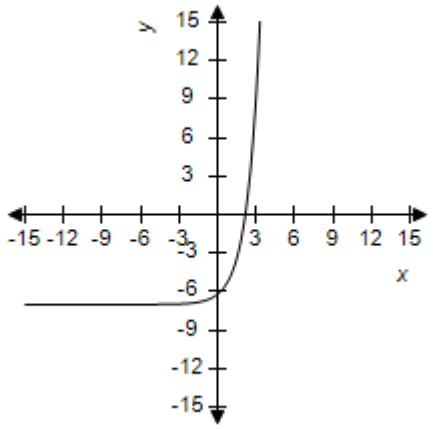
c.



d.



e.



ANSWER: c

29. Select the graph of the exponential function.

$y = 1.06^{-4x}$

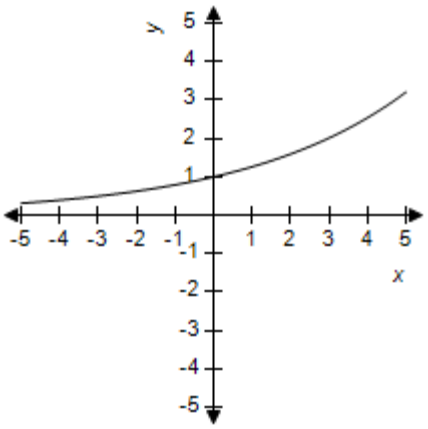
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

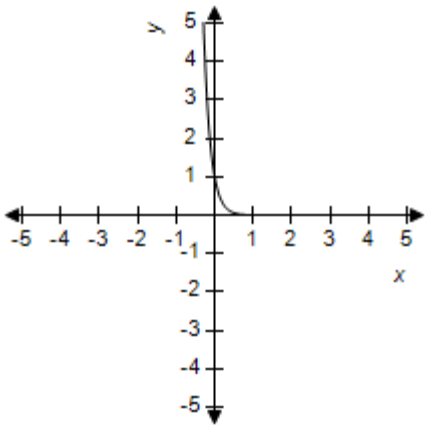
Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

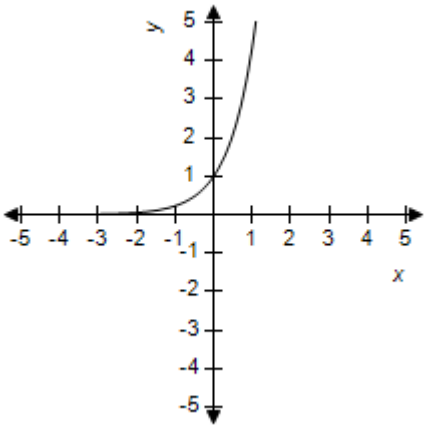
a.



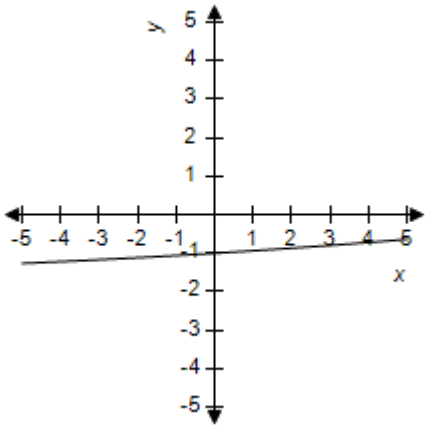
b.



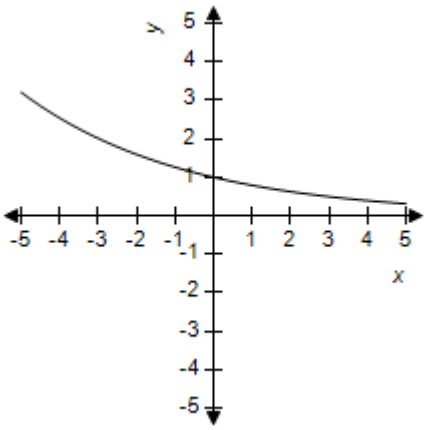
c.



d.



e.



ANSWER: e

30. Select the graph of the exponential function.

Copyright Cengage Learning. Powered by Cognero.

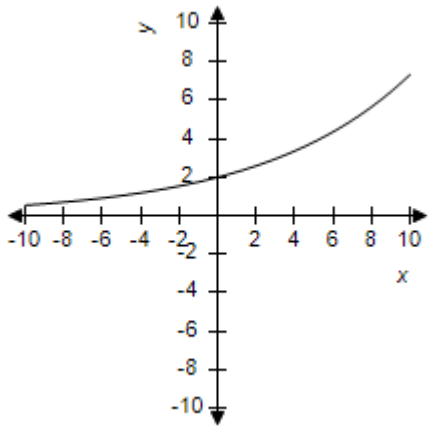
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

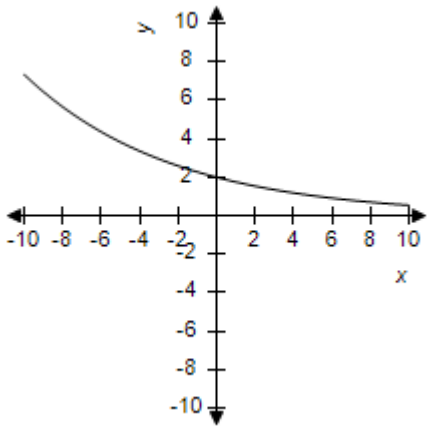
Section 5.1 Exponential Functions and Their Graphs

$s(t) = 2e^{0.13t}$

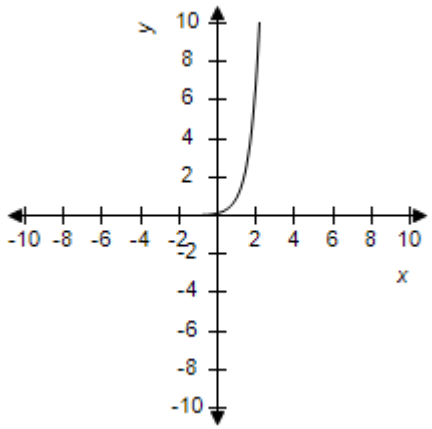
a.



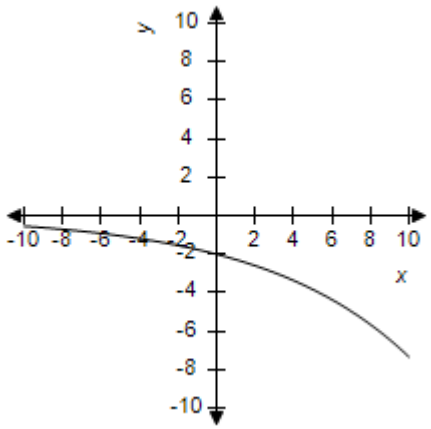
b.



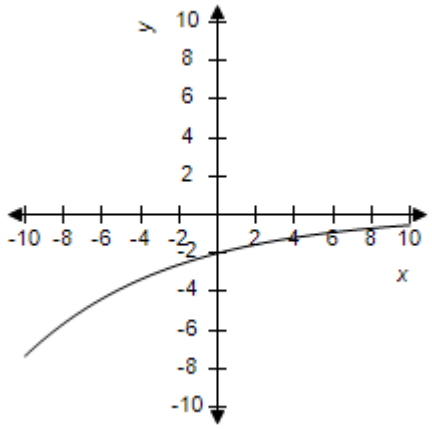
c.



d.



e.



ANSWER: a

31. Select the graph of the exponential function.

Copyright Cengage Learning. Powered by Cognero.

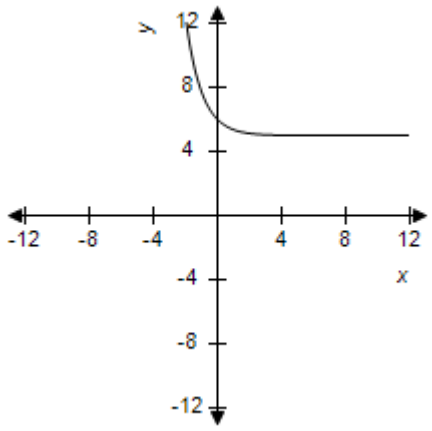
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

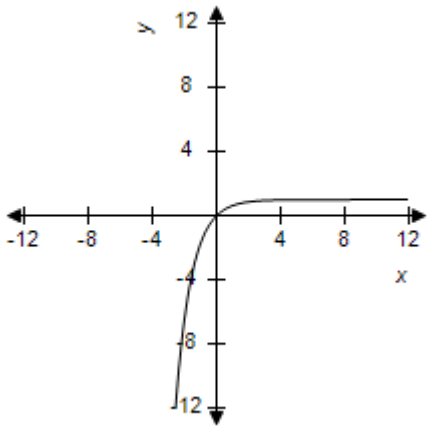
Section 5.1 Exponential Functions and Their Graphs

$g(x) = 3 + e^{-x}$

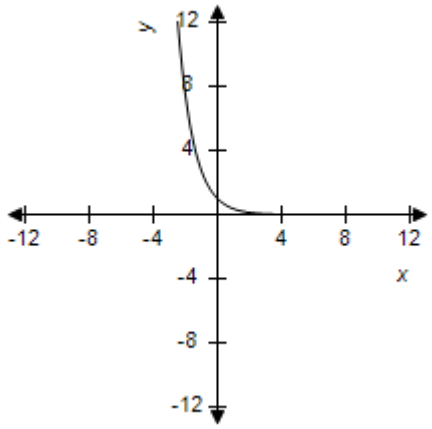
a.



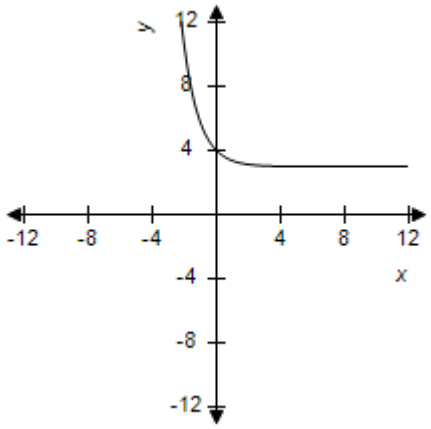
b.



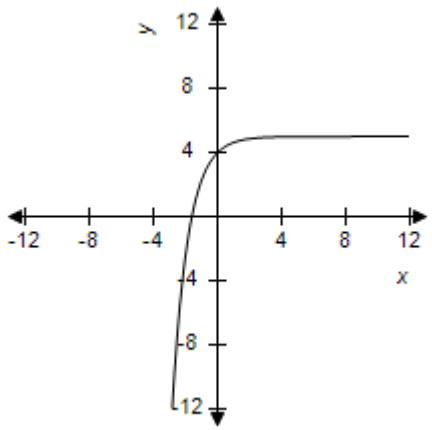
c.



d.



e.



ANSWER: d

32. Use the One-to-One Property to solve the equation for x.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

$2^{x+1}=16$

a. $x=7$
b. $x=3$
c. $x=6$
d. $x=4$
e. $x=5$

ANSWER: b

33. Use the One-to-One Property to solve the equation for x.

$\left(\frac{1}{3}\right)^x=9$

a. $x=3$
b. $x=-2$
c. $x=2$
d. $x=-3$
e. $x=4$

ANSWER: b

34. Use the One-to-One Property to solve the equation for x.

$e^{3x+4}=e^5$

a. $x=-\frac{1}{3}$
b. $x^2=5$
c. $x=-3$
d. $x=\frac{1}{3}$
e. $x=3$

ANSWER: d

35. Use the One-to-One Property to solve the equation for x.

$e^{x^2-6}=e^{5x}$

a. $x=-6$
b. $x=5$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

c. $x = 6, -1$

d. $x = -6, -1$

e. $x = -6, 1$

ANSWER: c

36. Complete the table to determine the balance A for P dollars invested at rate r for t years and compounded n times per year.

$P = \$1500;\ r = 2\%;\ t = 10$ years

a.

n	1	2	4	12	365	continuous
A	$1,828.49	$1830.29	$1,831.19	$1,831.80	$1,832.09	$1,832.10

b.

n	1	2	4	12	365	continuous
A	$1,828.49	$1,832.10	$1,831.19	$1,831.80	$1,831.80	$1,832.10

c.

n	1	2	4	12	365	continuous
A	$1,828.49	$1830.29	$1,828.49	$1,831.80	$1,831.80	$1,832.10

d.

n	1	2	4	12	365	continuous
A	$1830.29	$1,828.49	$1,831.19	$1,831.80	$1,832.09	$1,832.10

e.

n	1	2	4	12	365	continuous
A	$1,828.49	$1830.29	$1,831.19	$1,832.10	$1,831.80	$1,831.80

ANSWER: a

37. Let Q represent a mass of radioactive plutonium $\left({}^{239}\mathrm{Pu}\right)$ (in grams), whose half life is 24,100 years. The quantity of plutonium present after t years is $Q = 16\left(\frac{1}{2}\right)^{t/24{,}100}$. Determine the quantity present after 71,000 years. Round your answer to one decimal place.

a. 4.1 g

b. 3.1 g

c. 5.1 g

d. 2.1 g

e. 6.1 g

ANSWER: d

38. After t years, the value of a wheelchair conversion van that originally cost $38,000 depreciates so that each

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

year it is worth $\frac{9}{10}$ of its value for the previous year. Find a model for $V(t)$, the value of the van after t years.

a. $V(t) = -38{,}000\left(-\frac{9}{10}\right)^t$

b. $V(t) = 38{,}000\left(-\frac{9}{10}\right)^t$

c. $V(t) = -38{,}000\left(\frac{9}{10}\right)^t$

d. $V(t) = 38{,}000\left(\frac{9}{10}\right)^t$

e. $V(t) = 38{,}000\left(\frac{9}{10}\right)^{-t}$

ANSWER: d

39. Determine whether the statement is true or false. Justify your answer.

The line $y = -5$ is an asymptote for the graph of $f(x) = 10^x - 5$

a. False. As $x \to \infty$, $f(x) \to 5$ but never reaches 5.

b. True. As $x \to -\infty$, $f(x) \to -5$ but never reaches –5.

ANSWER: b

40. Use properties of exponents to determine which functions (if any) are the same.

$f(x) = 4^{x-2}$

$g(x) = 4^x - 16$

$h(x) = \frac{1}{16}(4^x)$

a. $f(x) = h(x)$

b. $f(x) = -g(x)$

c. $f(x) = g(x)$

d. $g(x) = h(x)$

e. $g(x) = -h(x)$

ANSWER: a

41. Evaluate the function $f(x) = 1.1^x$ at $x = 4.5$. Round the answer to 3 decimal places.

a. 1.210

b. 1.536

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

c. 5.230
d. 28.183
e. 4.950

ANSWER: b

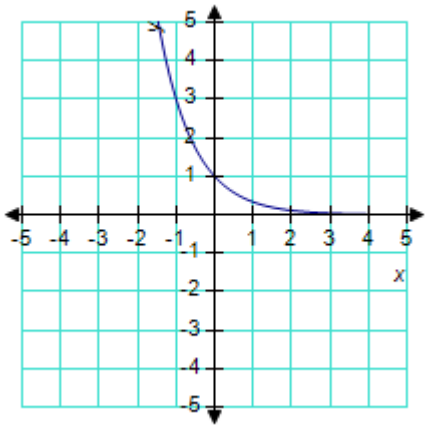
42. Evaluate the function $f(x) = 400(1.005)^x$ at $x = 180$. Round the answer to 3 decimal places.
a. 981.637
b. 1,323.419
c. 404.010
d. 72,360.000
e. 2.454

ANSWER: a

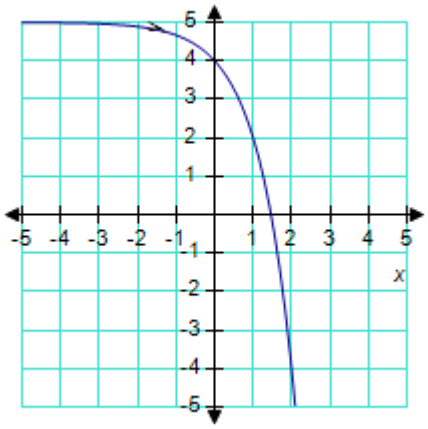
43. Identify the graph of the function.

$f(x) = 5 - 3^x$

a.



b.

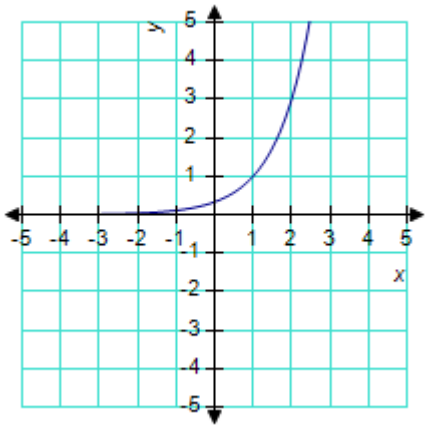


Copyright Cengage Learning. Powered by Cognero.

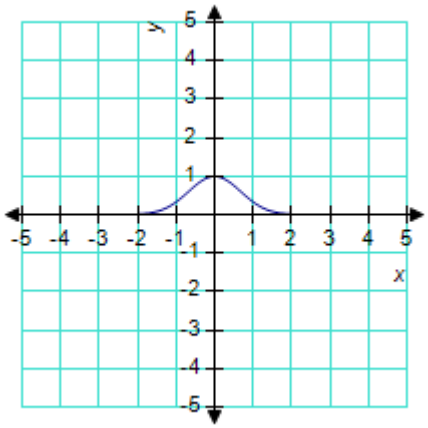
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

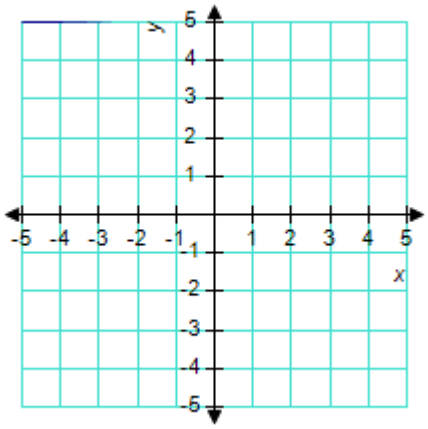
c.



d.



e.



ANSWER: b

44. What is the value of the function $f(x) = 4.8e^{-1.8x}$ at $x = -2.5$? Round the answer to 3 decimal places.

a. 0.065

b. 151,789.328

c. 58.715

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

d. 0.793
e. 432.082

ANSWER: e

45. What is the value of the function $f(x) = 100e^{0.4x}$ at $x = 1.3$? Round the answer to 3 decimal places.

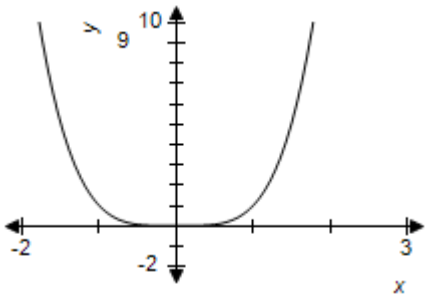
a. 149.182
b. 101.492
c. 30.386
d. 168.203
e. 331.131

ANSWER: d

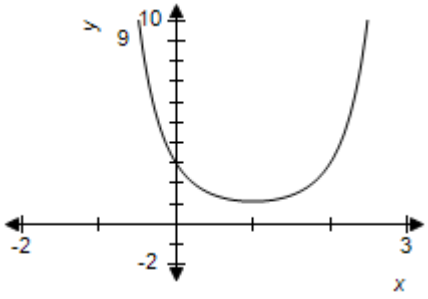
46. Use a graphing utility to determine which graph below is the graph of the function.

$g(x) = 0.1e^{-2x}$

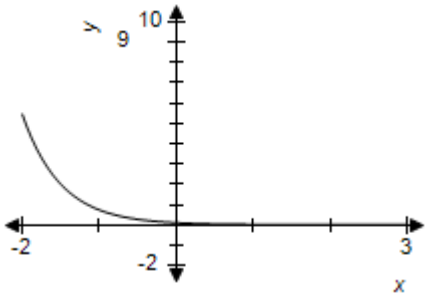
a.



b.



c.

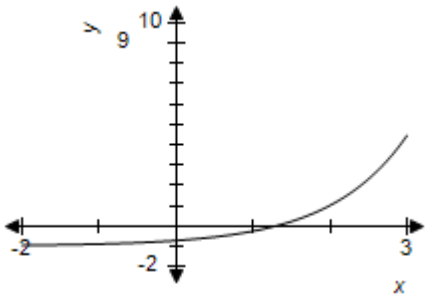


Copyright Cengage Learning. Powered by Cognero.

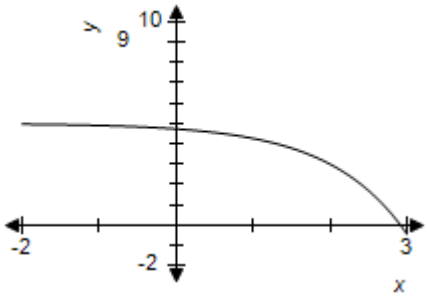
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

d.



e.



ANSWER: c

47. Use the One-to-One Property to solve the following equation for x.
$2^{3x} = 128$

a. $\frac{7}{3}$

b. $\frac{3}{7}$

c. $\frac{128}{3}$

d. 2

e. $-\frac{64}{3}$

ANSWER: a

48. Use the One-to-One Property to solve the following equation for x.

$\left(\frac{1}{3}\right)^{5x-1} = 27$

a. $\frac{4}{5}$

b. $-\frac{2}{5}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

c. $\frac{1}{3}$

d. $-\frac{3}{5}$

e. $\frac{1}{5}$

ANSWER: b

49. Let Q represent a mass of radioactive radium (^{226}Ra) (in grams), whose half-life is 1599 years. The quantity of radium present after t years is

$$Q = 3\left(\frac{1}{2}\right)^{t/1599}$$

Determine the quantity present after 500 years. Round the answer to the nearest hundredth of a gram if necessary.

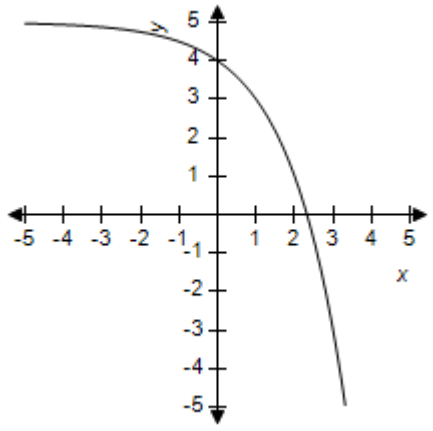
a. 0 g
b. 0.47 g
c. 3.00 g
d. 2.42 g
e. 0.81 g

ANSWER: d

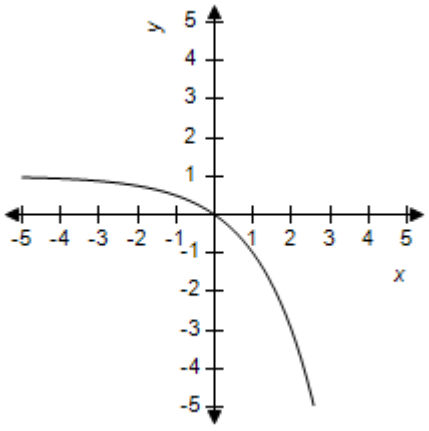
50. Sketch the graph of the function.

$$f(x) = 1 - 2^x$$

a.



b.



c.

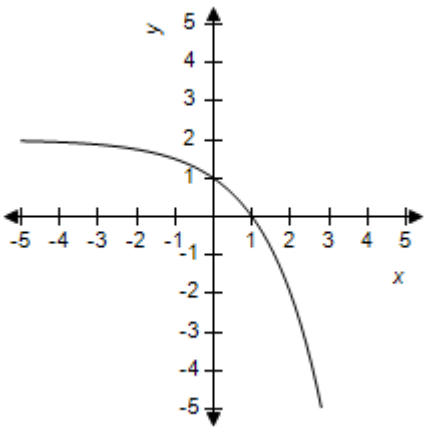
d.

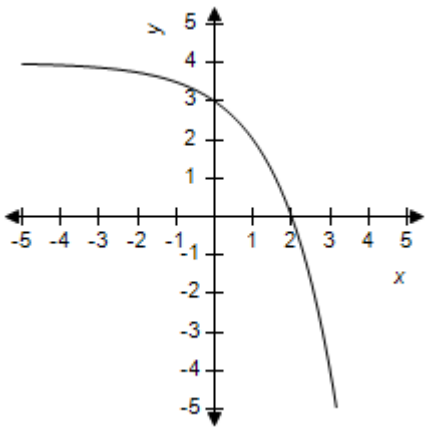
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

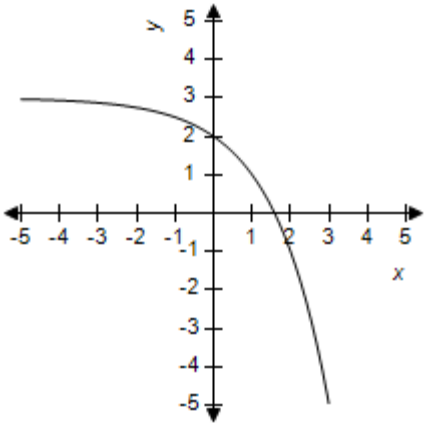
Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs





e.



ANSWER: b

51. Evaluate the function $f(x) = 1.1^x$ at $x = 1.8$. Round the answer to 3 decimal places.

a. 1.909
b. 1.980
c. 3.802
d. 1.187
e. 1.210

ANSWER: d

52. Identify the graph of the function.

$f(x) = \left(\frac{1}{6}\right)^x$

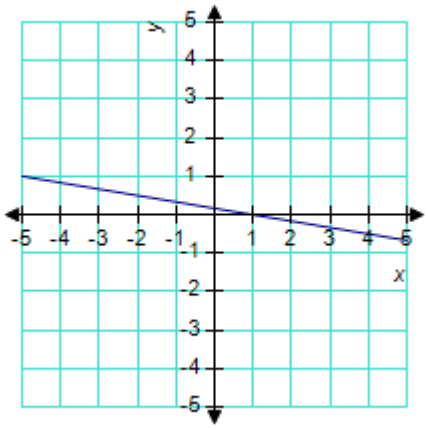
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

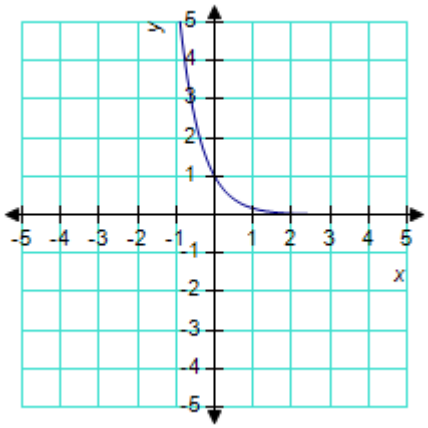
Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

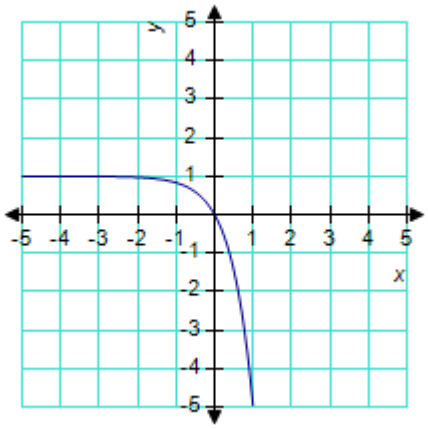
a.



b.



c.

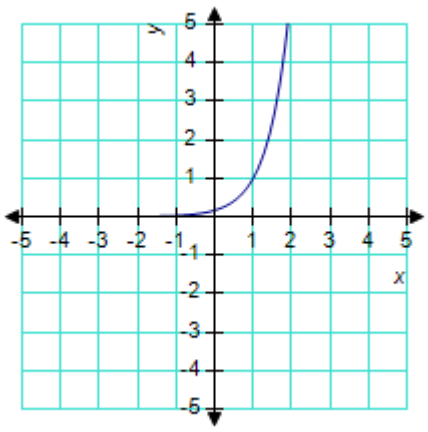


Copyright Cengage Learning. Powered by Cognero.

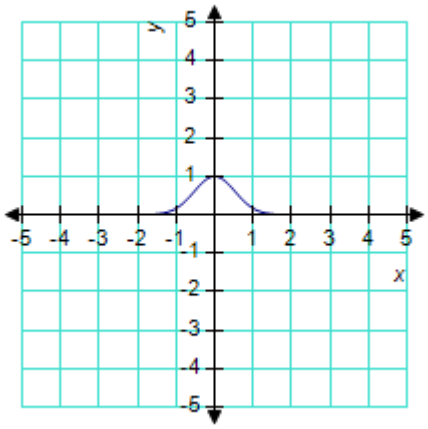
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

d.



e.



ANSWER: b

53. What is the value of the function $f(x) = 75e^{0.4x}$ at $x = 2.3$? Round the answer to 3 decimal places.

a. 188.197
b. 111.887
c. 9.116
d. 76.492
e. 623.823

ANSWER: a

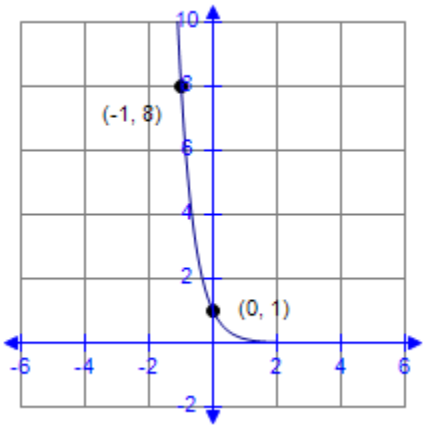
54. Find the value of b that would cause the graph of $y = b^x$ to look like the graph indicated.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs



a. $b = \frac{1}{8}$

b. $b = \frac{3}{8}$

c. $b = 8$

d. $b = -8$

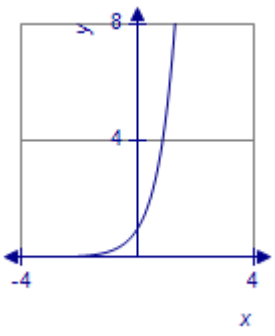
e. $b = -\frac{1}{8}$

ANSWER: a

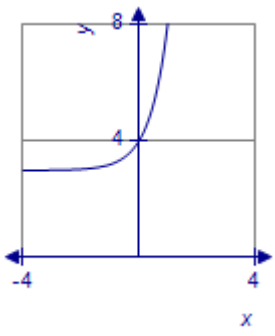
55. Graph the function.

$f(x) = 5^x$

a.



b.

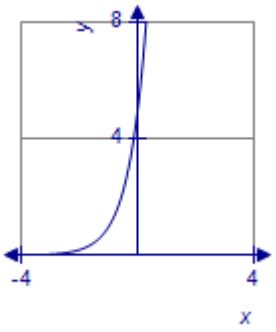


Copyright Cengage Learning. Powered by Cognero.

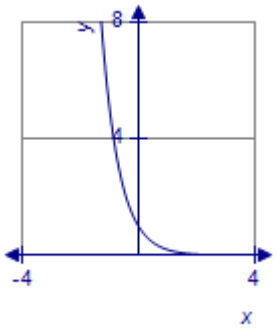
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

c.



d.

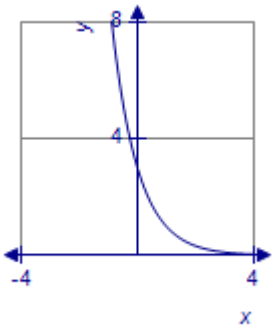


ANSWER: a

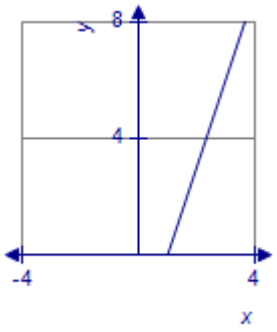
56. Graph the function using translations.

$f(x) = 3^{x+1}$

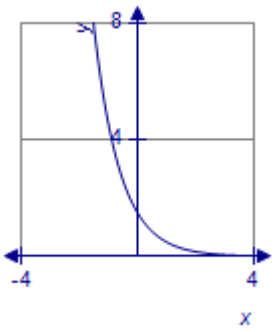
a.



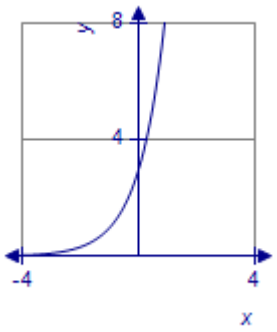
b.



c.



d.



ANSWER: d

57. Graph the exponential function.

$f(x) = 4^x + 1$

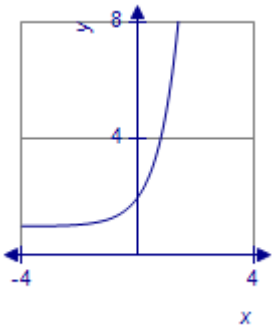
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

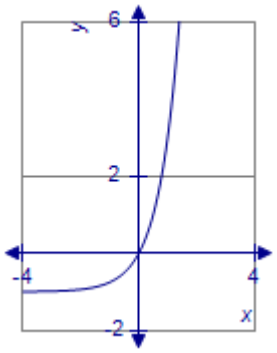
Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

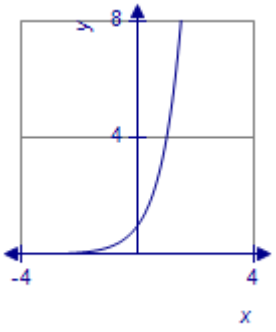
a.



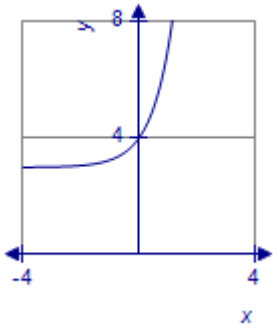
b.



c.



d.

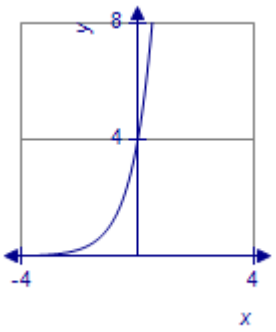


ANSWER: a

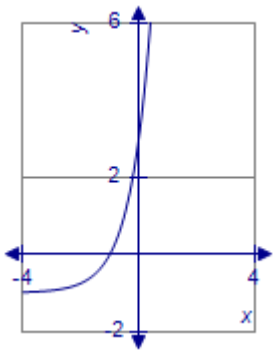
58. Graph the function using translations.

$f(x) = 4^{x+1} + 1$

a.



b.

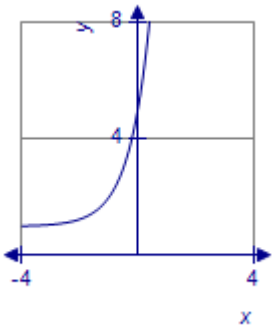


Copyright Cengage Learning. Powered by Cognero.

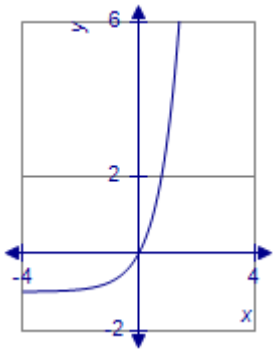
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

c.

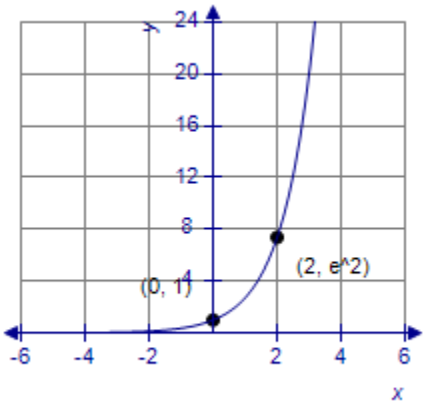


d.



ANSWER: c

59. Find the value of b that would cause the graph of $y = b^x$ to look like the graph below.



a. $b = \frac{1}{e^3}$

b. $b = e^3$

c. $b = e$

d. $b = \frac{1}{e}$

e. $b = e^2$

ANSWER: c

60. Graph the function using translations.

$f(x) = e^{x+1} + 1$

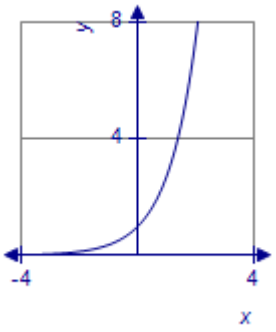
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

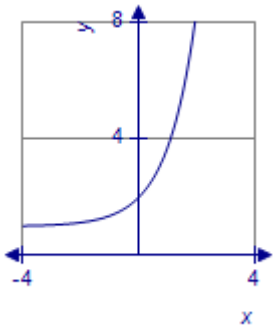
Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs

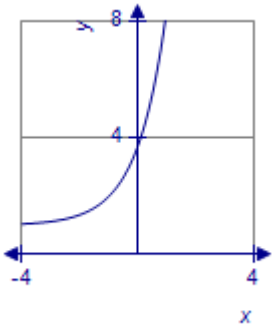
a.



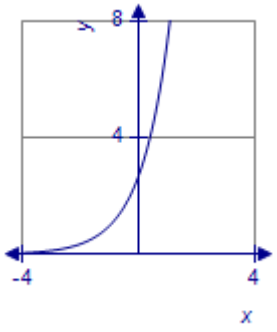
b.



c.



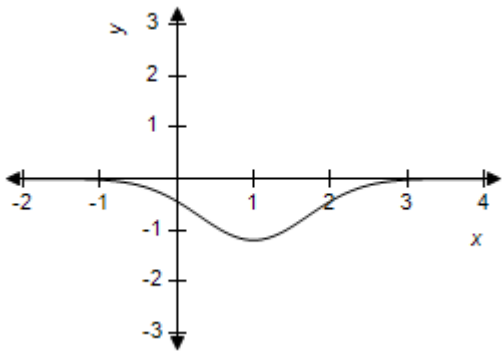
d.



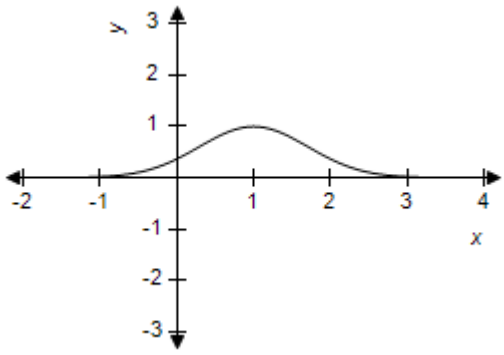
ANSWER: c

61. Use a graphing utility to determine which graph below is the graph of the function.
$s(x) = 1.2e^{-(x-1)^2}$

a.



b.

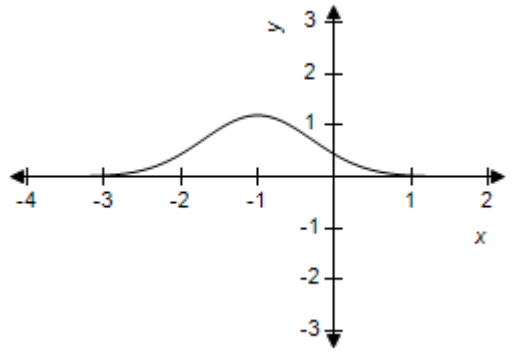


Copyright Cengage Learning. Powered by Cognero.

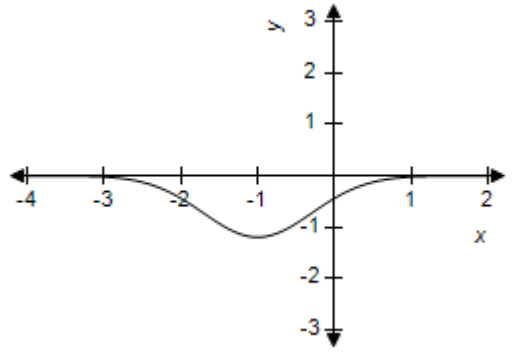
Trigonometry 12th edition Larson Test Bank

Section 5.1 Exponential Functions and Their Graphs

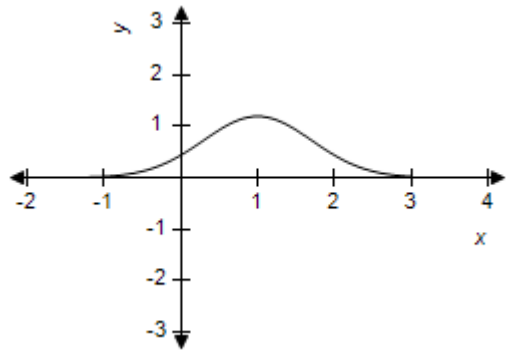
c.



d.



e.



ANSWER: e

62. Sketch the graph of the function

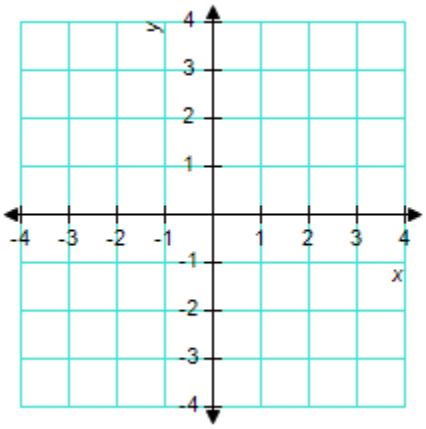
$f(x) = 5^{x/2}$

Copyright Cengage Learning. Powered by Cognero.

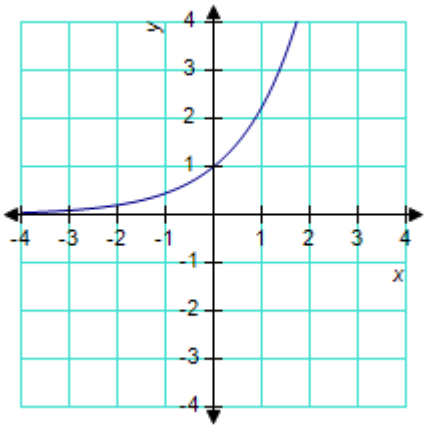
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 5.1 Exponential Functions and Their Graphs



ANSWER:



Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 6.1 Lines

1. Find the slope m of the line with inclination Θ. Round your answer to four decimal places.

$\Theta = 1.29$ radians

a. $m \approx 4.4672$
b. $m \approx 2.4672$
c. $m \approx 5.4672$
d. $m \approx 3.4672$
e. $m \approx 1.4672$

ANSWER: d

2. Find the slope m of the line with inclination Θ. Round your answer to four decimal places.

$\Theta = 2.42$ radians

a. $m \approx -0.9799$
b. $m \approx -1.0799$
c. $m \approx -1.1799$
d. $m \approx -0.8799$
e. $m \approx -1.2799$

ANSWER: d

3. Find the inclination Θ (in degrees) of the line with a slope of m. Round your answer to one decimal place.

$m = -3$

a. $\Theta \approx 108.4°$
b. $\Theta \approx 109.4°$
c. $\Theta \approx 110.4°$
d. $\Theta \approx 107.4°$
e. $\Theta \approx 106.4°$

ANSWER: a

4. Find the inclination Θ (in degrees) of the line with a slope of m. Round your answer to one decimal place.

$m = 6$

a. $\Theta \approx 80.5°$
b. $\Theta \approx 81.5°$
c. $\Theta \approx 82.5°$
d. $\Theta \approx 79.5°$
e. $\Theta \approx 78.5°$

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 6.1 Lines

5. Find the inclination Θ (in degrees) of the line with a slope of m. Round your answer to one decimal place.

$m = 0.8333333333$

a. $\Theta \approx 41.8°$
b. $\Theta \approx 40.8°$
c. $\Theta \approx 39.8°$
d. $\Theta \approx 38.8°$
e. $\Theta \approx 37.8°$

ANSWER: c

6. Find the inclination Θ (in degrees) of the line with a slope of m. Round your answer to one decimal places.

$m = -2.5$

a. $\Theta \approx 112.8°$
b. $\Theta \approx 113.8°$
c. $\Theta \approx 111.8°$
d. $\Theta \approx 109.8°$
e. $\Theta \approx 110.8°$

ANSWER: c

7. Find the inclination Θ (in radians and degrees) of the line passing through the points. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

(6, 3), (10, 9)

a. $\Theta \approx 1.0002$ radians $\approx 57.3°$
b. $\Theta \approx 0.9653$ radians $\approx 55.3°$
c. $\Theta \approx 1.0177$ radians $\approx 58.3°$
d. $\Theta \approx 0.9479$ radians $\approx 54.3°$
e. $\Theta \approx 0.9828$ radians $\approx 56.3°$

ANSWER: e

8. Find the inclination Θ (in radians and degrees) of the line passing through the points. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

(10,9),(2,1)

a. $\Theta \approx 0.6947$ radians ≈ 39.8
b. $\Theta \approx 0.7122$ radians ≈ 40.8
c. $\Theta \approx 0.6773$ radians ≈ 38.8

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

d. $\Theta \approx 0.7296$ radians ≈ 41.8

e. $\Theta \approx 0.6598$ radians ≈ 37.8

ANSWER: a

9. Find the inclination Θ (in radians and degrees) of the line passing through the points. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$(-4,40),(35,0)$

a. $\Theta \approx 2.3784$ radians $\approx 136.3°$

b. $\Theta \approx 2.3086$ radians $\approx 132.3°$

c. $\Theta \approx 2.4134$ radians $\approx 138.3°$

d. $\Theta \approx 2.2737$ radians $\approx 130.3°$

e. $\Theta \approx 2.3435$ radians $\approx 134.3°$

ANSWER: e

10. Find the inclination Θ (in radians and degrees) of the line passing through the points. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$(0,150),(20,0)$

a. $\Theta \approx 1.7732$ radians $\approx 101.6°$

b. $\Theta \approx 1.6335$ radians $\approx 93.6°$

c. $\Theta \approx 1.7383$ radians $\approx 99.6°$

d. $\Theta \approx 1.7033$ radians $\approx 97.6°$

e. $\Theta \approx 1.6684$ radians $\approx 95.6°$

ANSWER: d

11. Find the inclination Θ (in radians and degrees) of the line. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$4x - 2y + 10 = 0$

a. $\Theta \approx 1.1944$ radians $\approx 68.4°$

b. $\Theta \approx 1.0373$ radians $\approx 59.4°$

c. $\Theta \approx 1.1421$ radians $\approx 65.4°$

d. $\Theta \approx 1.0722$ radians $\approx 61.4°$

e. $\Theta \approx 1.1071$ radians $\approx 63.4°$

ANSWER: e

12. Find the inclination Θ (in radians and degrees) of the line. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

$7x + 8y - 15 = 0$

a. $\Theta \approx 2.4926$ radians $\approx 142.8°$
b. $\Theta \approx 2.3529$ radians $\approx 134.8°$
c. $\Theta \approx 2.4577$ radians $\approx 140.8°$
d. $\Theta \approx 2.4228$ radians $\approx 138.8°$
e. $\Theta \approx 2.3879$ radians $\approx 136.8°$

ANSWER: d

13. Find the inclination Θ (in radians and degrees) of the line. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$15x + 13y = 0$

a. $\Theta \approx 2.2849$ radians $\approx 130.9°$
b. $\Theta \approx 2.3896$ radians $\approx 136.9°$
c. $\Theta \approx 2.2151$ radians $\approx 126.9°$
d. $\Theta \approx 2.3198$ radians $\approx 132.9°$
e. $\Theta \approx 2.2500$ radians $\approx 128.9°$

ANSWER: a

14. Find the inclination Θ (in radians and degrees) of the line. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$2x - 10y - 15 = 0$

a. $\Theta \approx 0.3021$ radians $\approx 17.3°$
b. $\Theta \approx 0.1974$ radians $\approx 11.3°$
c. $\Theta \approx 0.1276$ radians $\approx 7.3°$
d. $\Theta \approx 0.2323$ radians $\approx 13.3°$
e. $\Theta \approx 0.1625$ radians $\approx 9.3°$

ANSWER: b

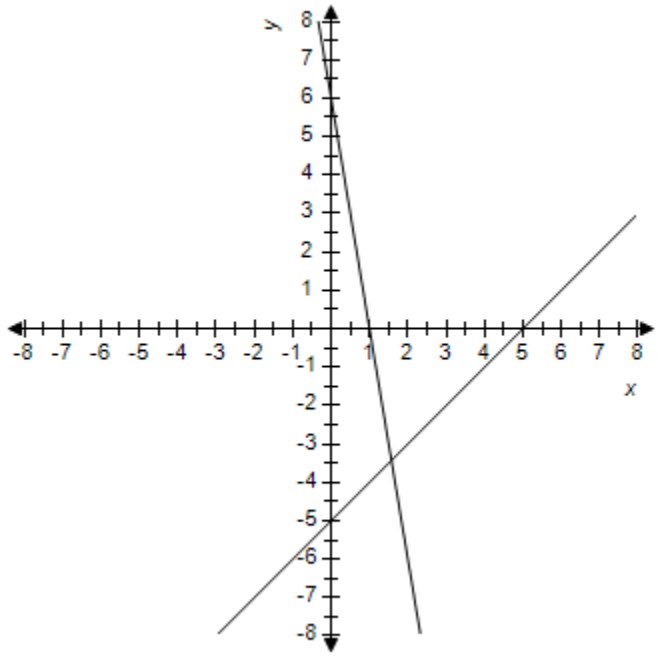
15. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal places for degree.

$6x + y = 6$
$x - y = 5$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines



a. $\theta \approx 0.9505$ radians $\approx 54.5°$
b. $\theta \approx 1.0378$ radians $\approx 59.5°$
c. $\theta \approx 0.9331$ radians $\approx 53.5°$
d. $\theta \approx 0.9855$ radians $\approx 56.5°$
e. $\theta \approx 0.8807$ radians $\approx 50.5°$

ANSWER: a

16. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

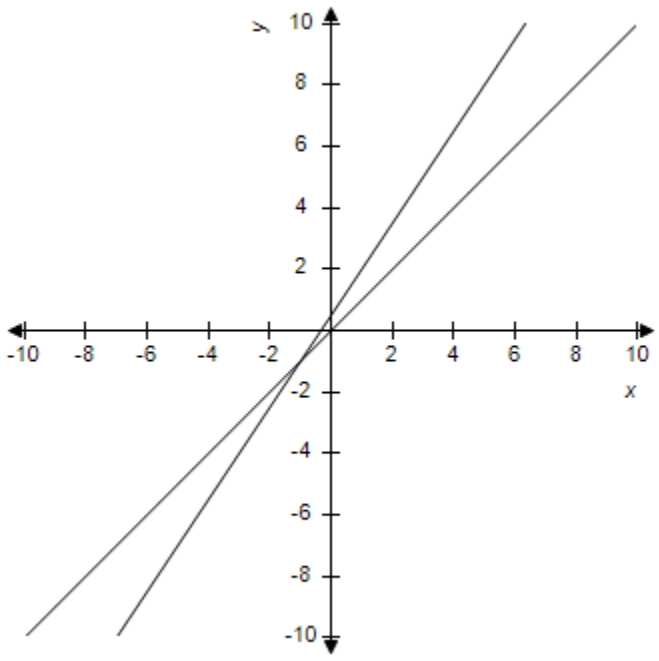
$x - y = 0$
$3x - 2y = -1$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 6.1 Lines



a. $\Theta \approx 0.2148\ radian \approx 12.3°$
b. $\Theta \approx 0.1799\ radian \approx 10.3°$
c. $\Theta \approx 0.1974\ radian \approx 11.3°$
d. $\Theta \approx 0.2323\ radian \approx 13.3°$
e. $\Theta \approx 0.1625\ radian \approx 9.3°$

ANSWER: c

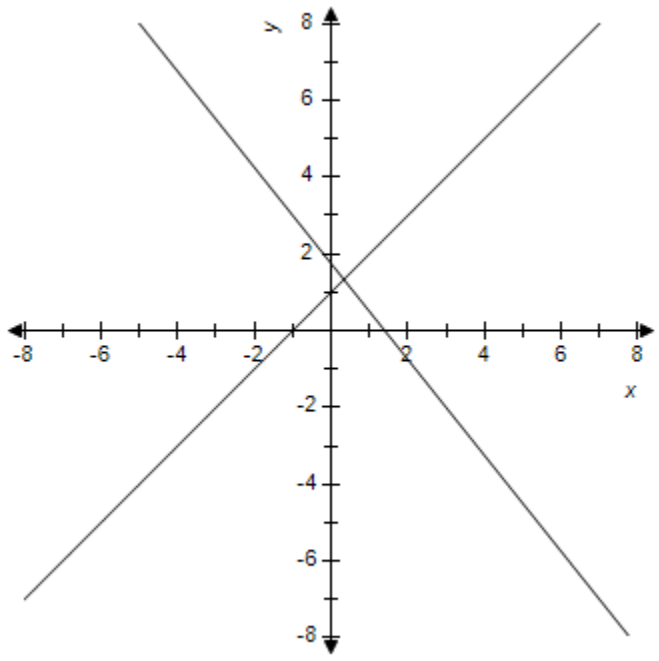
17. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$3x - 3y = 3$
$5x + 4y = 7$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines



a. $\Theta \approx 1.4601$ *radians* $\approx 83.7°$
b. $\Theta \approx 1.4427$ *radians* $\approx 82.7°$
c. $\Theta \approx 1.4776$ *radians* $\approx 84.7°$
d. $\Theta \approx 1.4950$ *radians* $\approx 85.7°$
e. $\Theta \approx 1.4252$ *radians* $\approx 81.7°$

ANSWER: a

18. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$x - 2y = 3$
$10x + 2y = 5$

a. $\Theta \approx 1.3220$ radians $\approx 75.7°$
b. $\Theta \approx 1.3045$ radians $\approx 74.7°$
c. $\Theta \approx 1.2347$ radians $\approx 70.7°$
d. $\Theta \approx 1.3395$ radians $\approx 76.7°$
e. $\Theta \approx 1.2696$ radians $\approx 72.7°$

ANSWER: b

19. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 6.1 Lines

$6x + 3y = 9$
$9x - 8y = -7$

a. $\Theta \approx 1.2077$ radians $\approx 69.2°$
b. $\Theta \approx 1.1728$ radians $\approx 67.2°$
c. $\Theta \approx 1.2252$ radians $\approx 70.2°$
d. $\Theta \approx 1.1903$ radians $\approx 68.2°$
e. $\Theta \approx 1.1554$ radians $\approx 66.2°$

ANSWER: d

20. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$x - y = 14$
$7x - 6y = 5$

a. $\Theta \approx 0.0942$ radians $\approx 5.4°$
b. $\Theta \approx 0.0593$ radians $\approx 3.4°$
c. $\Theta \approx 0.0768$ radians $\approx 4.4°$
d. $\Theta \approx 0.1117$ radians $\approx 6.4°$
e. $\Theta \approx 0.0419$ radians $\approx 2.4°$

ANSWER: c

21. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$5x - 7y = 12$
$5x + 7y = 6$

a. $\Theta \approx 1.2580$ radians $\approx 72.1°$
b. $\Theta \approx 1.2230$ radians $\approx 70.1°$
c. $\Theta \approx 1.2405$ radians $\approx 71.1°$
d. $\Theta \approx 1.2754$ radians $\approx 73.1°$
e. $\Theta \approx 1.2056$ radians $\approx 69.1°$

ANSWER: c

22. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$0.1x + 0.05y = 0.15$
$0.08x - 0.07y = 0.06$

a. $\Theta \approx 1.1999$ radians $\approx 68.8°$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

b. $\Theta \approx 1.1650$ radians $\approx 66.8°$
c. $\Theta \approx 1.2174$ radians $\approx 69.8°$
d. $\Theta \approx 1.1476$ radians $\approx 65.8°$
e. $\Theta \approx 1.1825$ radians $\approx 67.8°$

ANSWER: e

23. Find the angle Θ (in radians and degrees) between the lines. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.

$0.04x + 0.02y = -0.06$
$0.03x - 0.02y = 0.01$

a. $\Theta \approx 1.0691$ radians $\approx 61.3°$
b. $\Theta \approx 1.0342$ radians $\approx 59.3°$
c. $\Theta \approx 1.0866$ radians $\approx 62.3°$
d. $\Theta \approx 1.0167$ radians $\approx 58.3°$
e. $\Theta \approx 1.0517$ radians $\approx 60.3°$

ANSWER: e

24. Find the distance d between the point and the line. Round your answer to four decimal places.

Point Line
(5,12) $5x - y = 10$

a. $d \approx 2.0026$
b. $d \approx 0.5883$
c. $d \approx 2.8244$
d. $d \approx 0.3397$
e. $d \approx 1.5566$

ANSWER: b

25. Find the distance d between the point and the line. Round your answer to four decimal places.

Point Line
(2,5) $7x + y = 1$

a. $d \approx 2.5456$
b. $d \approx 5.1913$
c. $d \approx 5.0912$
d. $d \approx 1.1314$
e. $d \approx 5.6872$

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

26. Find the distance d between the point and the line. Round your answer to four decimal places.

Point	Line
$(5,6)$	$x-y=4$

a. $d \approx 10.6066$
b. $d \approx 2.1213$
c. $d \approx 2.0412$
d. $d \approx 6.6771$
e. $d \approx 3.5355$

ANSWER: e

27. Find the distance d between the point and the line.

Point	Line
$(4,5)$	$x+4=0$

a. $d = 9$
b. $d = 10$
c. $d = 7$
d. $d = 11$
e. $d = 8$

ANSWER: e

28. Find the distance d between the point and the line. Round your answer to four decimal places.

Point	Line
$(7,1)$	$-7x+y-7=0$

a. $d \approx 7.7782$
b. $d \approx 5.9178$
c. $d \approx 10.4965$
d. $d \approx 6.3640$
e. $d \approx 4.4907$

ANSWER: a

29. Find the distance d between the point and the line. Round your answer to four decimal places.

Point	Line
$(7,4)$	$9x-y=0$

a. $d \approx 3.2025$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

b. $d \approx 9.2143$

c. $d \approx 6.5155$

d. $d \approx 3.7617$

e. $d \approx 9.6571$

ANSWER: c

30. Find the distance d between the point and the line. Round your answer to four decimal places.

Point Line

(9,2) $x - y = 45$

a. $d \approx 39.5980$

b. $d \approx 21.9393$

c. $d \approx 26.8701$

d. $d \approx 46.5403$

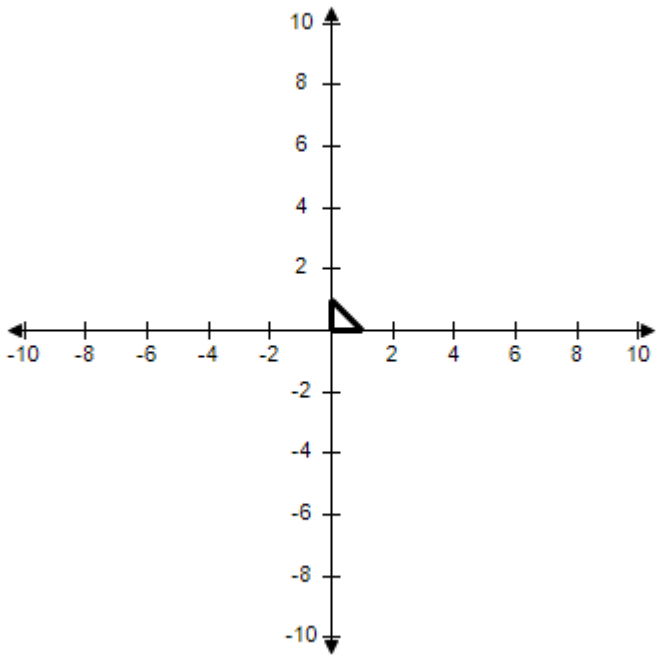
e. $d \approx 30.0117$

ANSWER: c

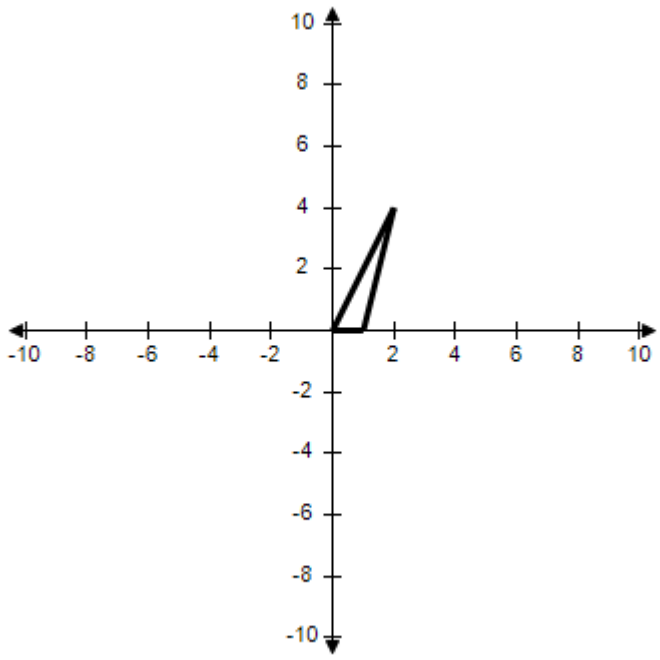
31. The given points represent the vertices of a triangle. Select the triangle ABC in the coordinate plane.

$A = (0,0)$, $B = (1,4)$, $C = (4,0)$

a.



b.



c.

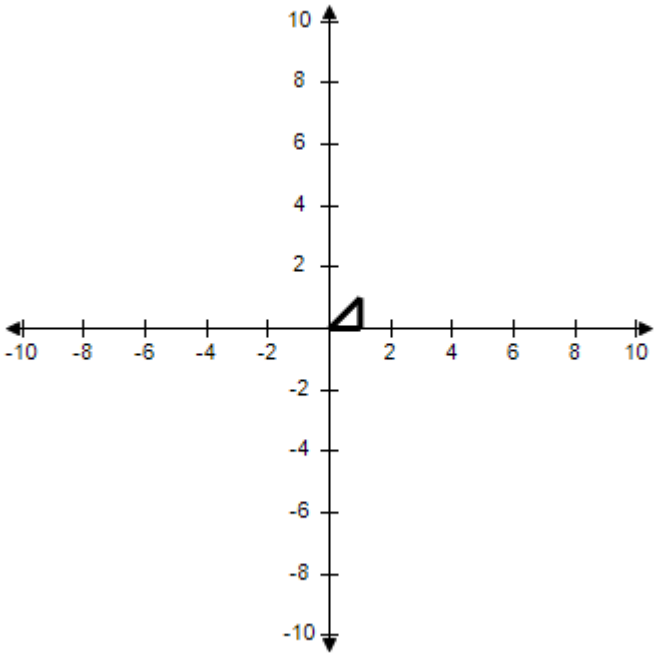
d.

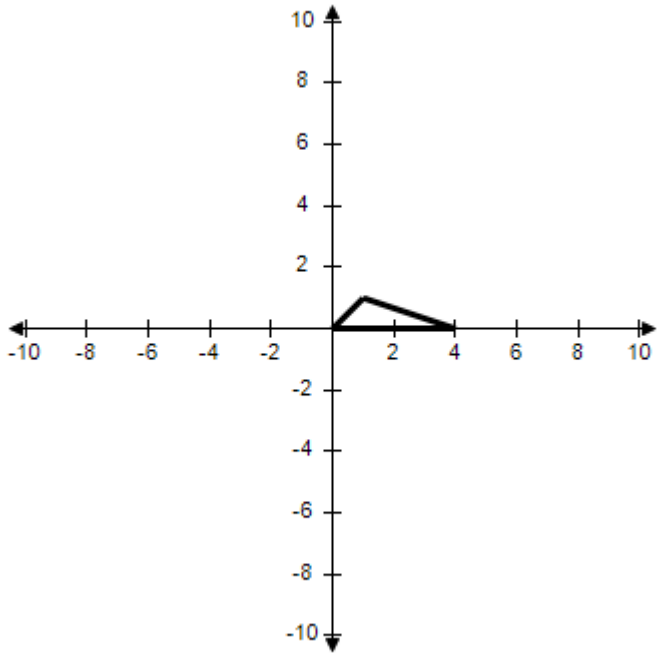
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

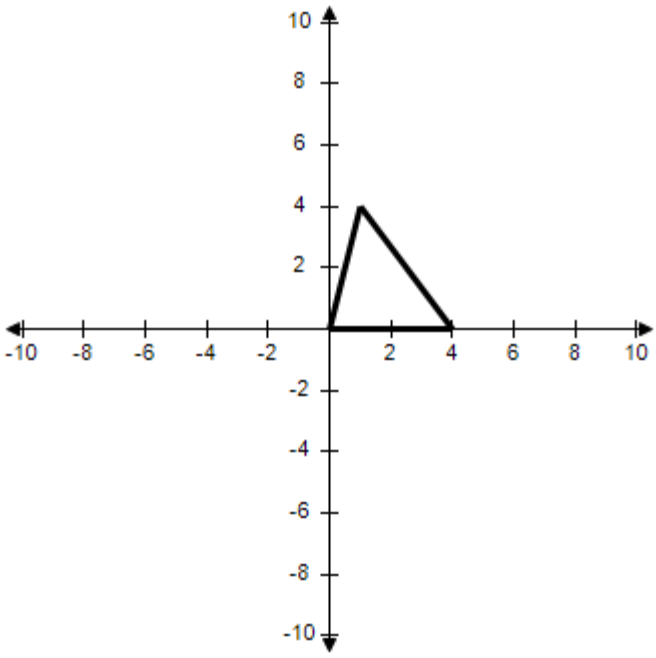
Name:_____ Class:_____ Date:_____

Section 6.1 Lines





e.



ANSWER: e

32. The given points represent the vertices of a triangle. Select the triangle ABC in the coordinate plane.

$A = (0,0)$, $B = (6,7)$, $C = (7,-1)$

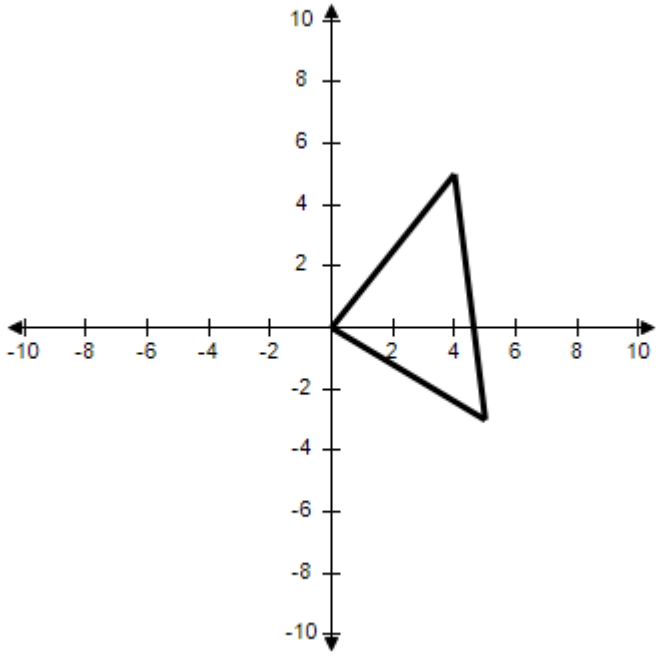
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

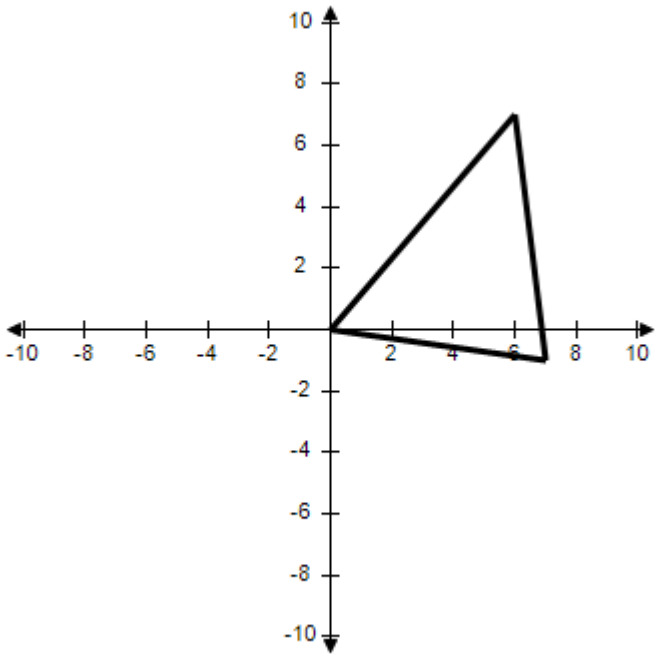
Name:_____ Class:_____ Date:_____

Section 6.1 Lines

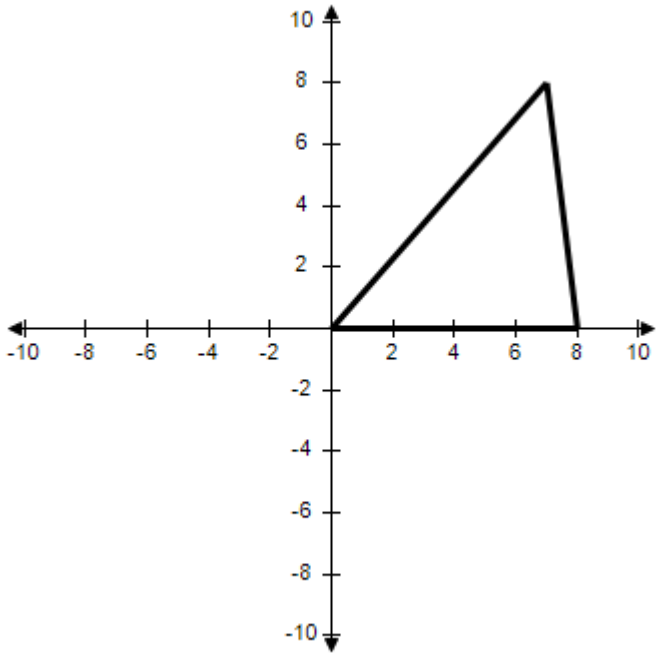
a.



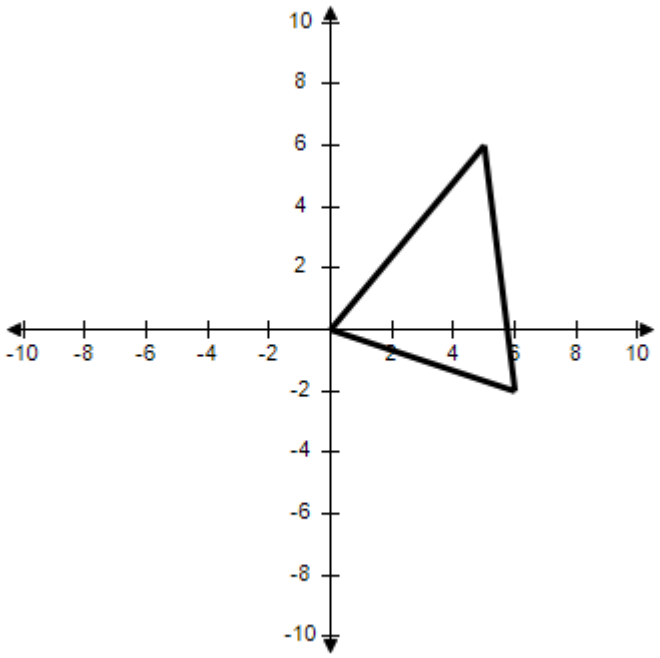
b.



c.



d.

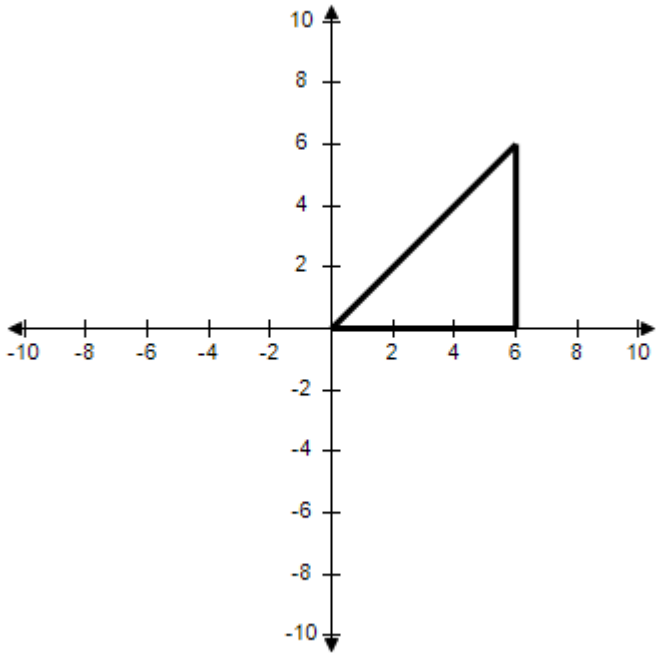


e.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines



ANSWER: b

33. The given points represent the vertices of a triangle. Select the triangle ABC in the coordinate plane.

$A = \left(-\frac{1}{6}, \frac{1}{7}\right), B = (6,7), C = \left(\frac{6}{7}, 0\right)$

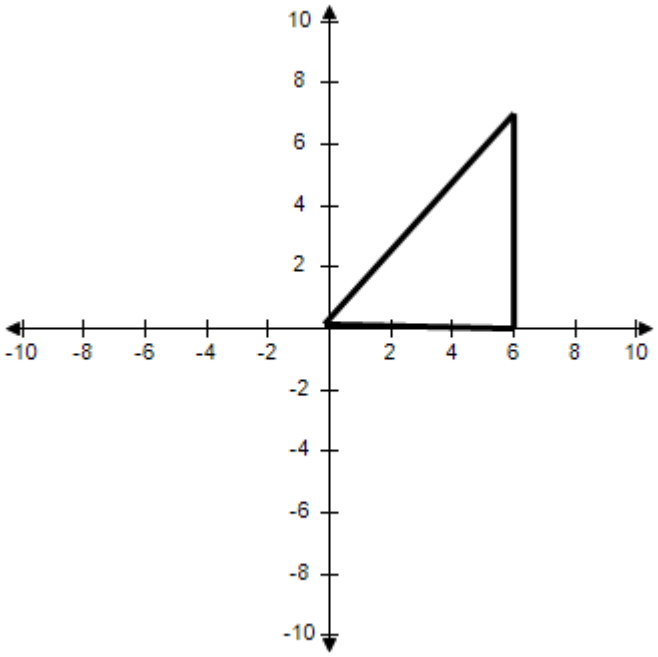
a. b.

Copyright Cengage Learning. Powered by Cognero.

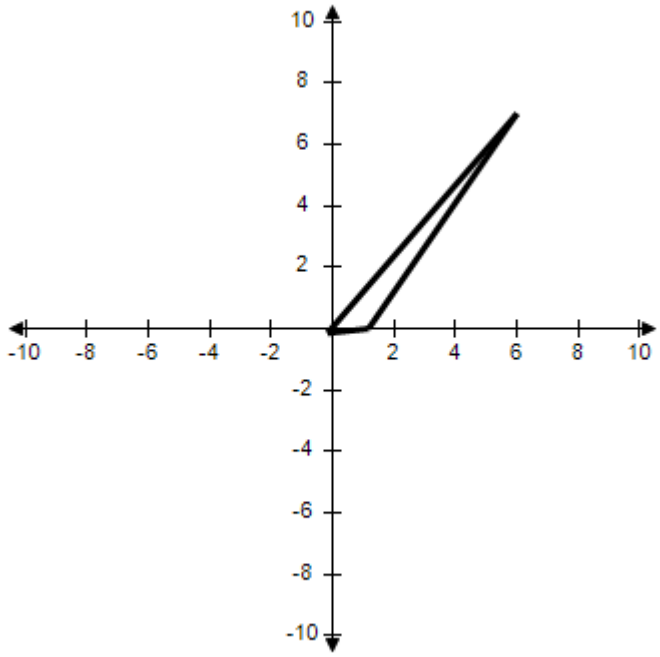
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

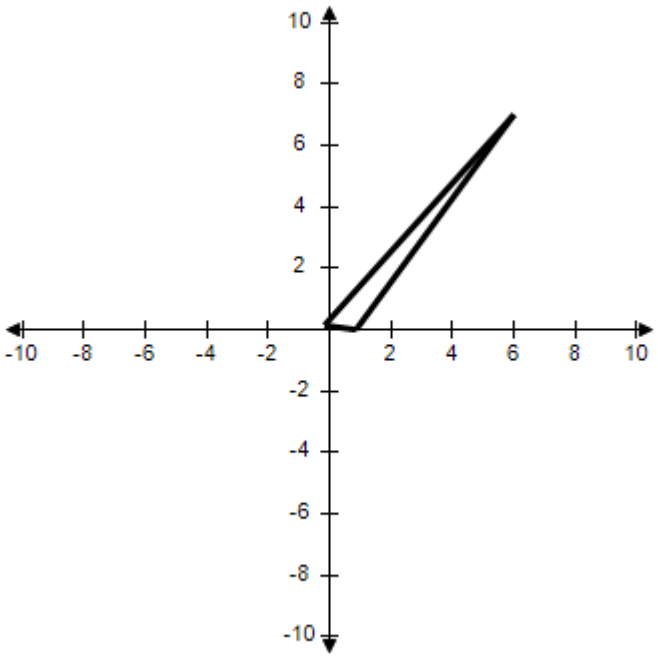
Section 6.1 Lines



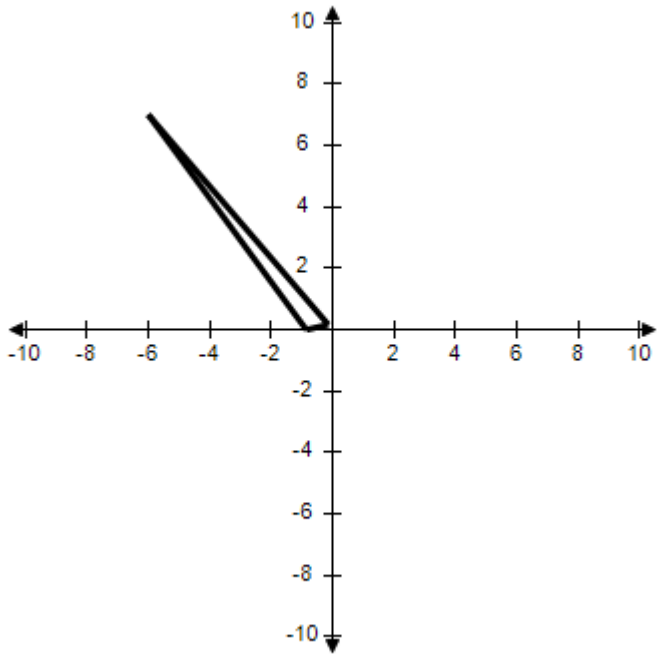
c.



d.



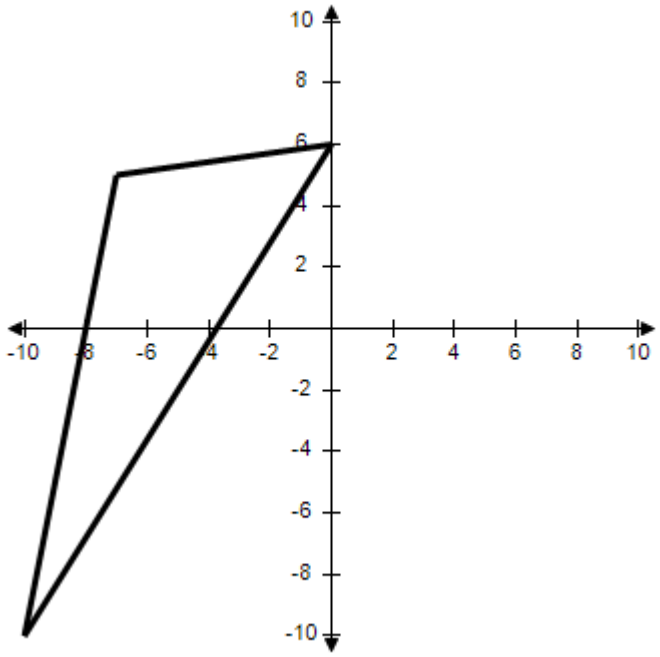
e.



Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines



ANSWER: c

34. The given points represent the vertices of a triangle. Select the triangle ABC in the coordinate plane.

A = (–4,–5), B = (5,10), C = (8,10)

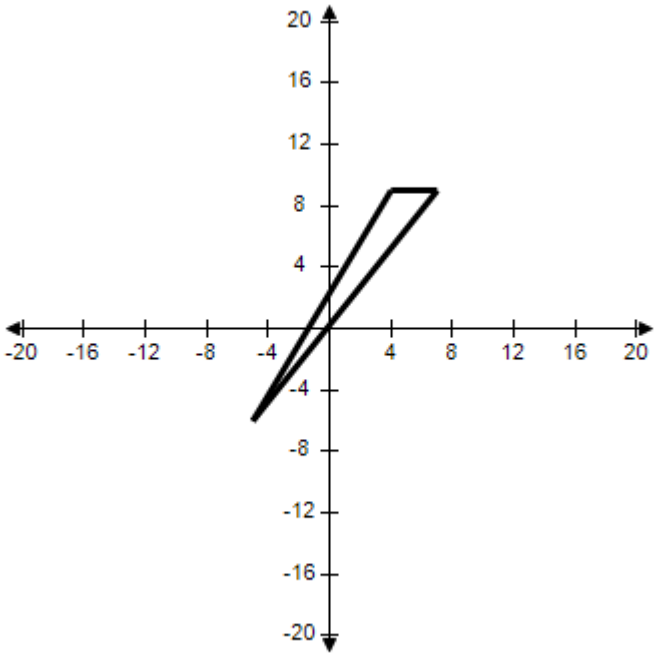
a. b.

Copyright Cengage Learning. Powered by Cognero.

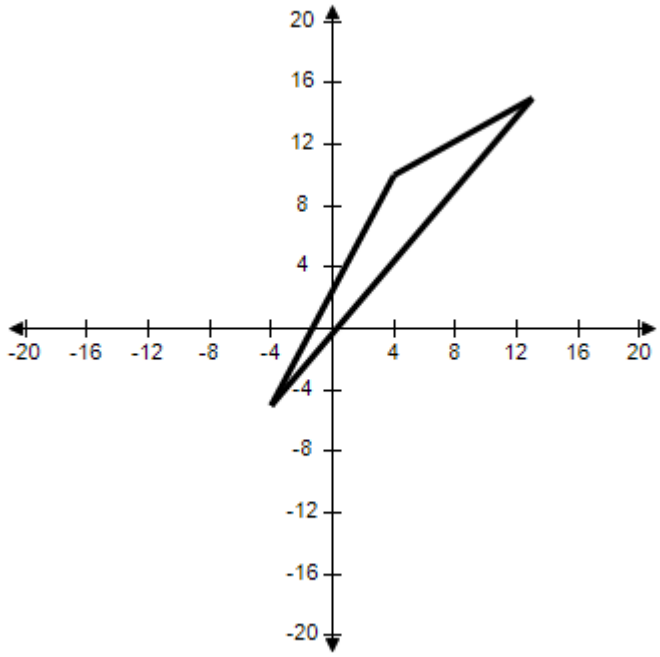
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

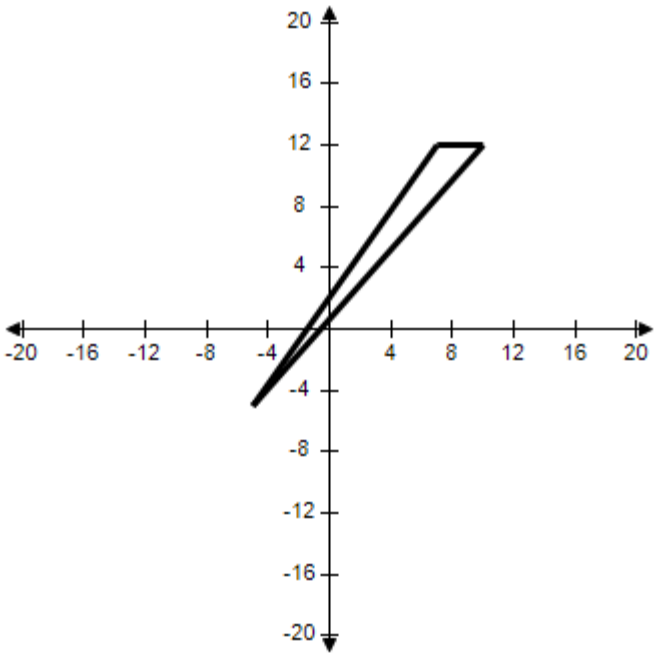
Section 6.1 Lines



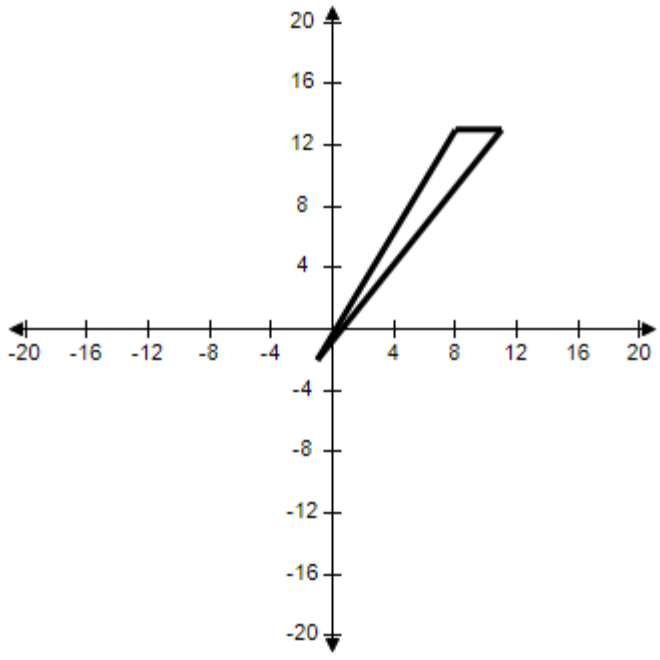
c.



d.



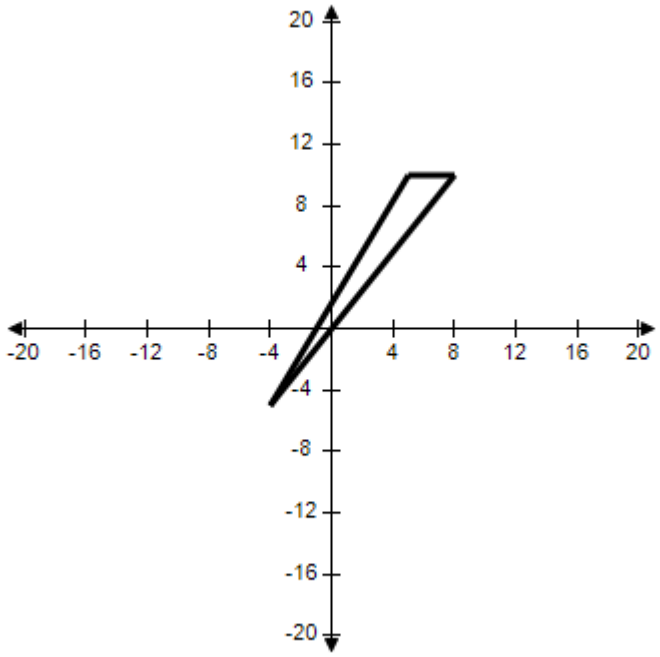
e.



Copyright Cengage Learning. Powered by Cognero.

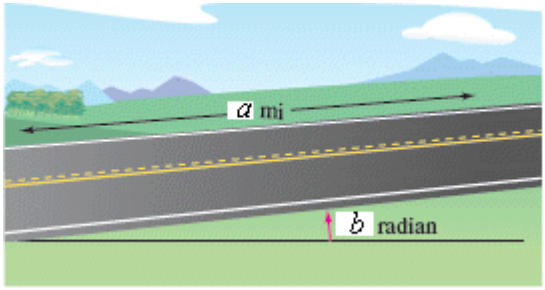
Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines



ANSWER: e

35. A straight road rises with an inclination of 0.22 radian from the horizontal (see figure). Find the slope m of the road and the change in elevation (x) over a six-mile stretch of the road. Round your answer to four decimal places for the m and round your answers to the nearest foot for the change in elevation.



$a = 6,\ b = 0.22$

a. $m \approx 0.4708$
   $x \approx 6{,}986$ feet
b. $m \approx 0.2182$
   $x \approx 6{,}941$ feet
c. $m \approx 0.2549$
   $x \approx 6{,}854$ feet
d. $m \approx 0.3216$
   $x \approx 6{,}782$ feet

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

e. $m \approx 0.2236$
$x \approx 6{,}914$ feet

ANSWER: e

36. A straight road rises with an inclination of 0.22 radian from the horizontal. Find the slope of the road and the change in elevation over a three-mile stretch of the road. Round your answer to four decimal places for the m and round your answer to the nearest foot for the change in elevation.

a. $m \approx 0.2182$
$x \approx 3{,}802$ feet
b. $m \approx 0.3216$
$x \approx 4{,}217$ feet
c. $m \approx 0.2236$
$x \approx 3{,}457$ feet
d. $m \approx 0.1581$
$x \approx 1{,}847$ feet
e. $m \approx 0.1748$
$x \approx 2{,}444$ feet

ANSWER: c

37. A roof has a rise of 7 feet for every horizontal change of 9 feet (see figure). Find the inclination of the roof Θ. Round your answer to one decimal place.



$a = 7,\ b = 9$

a. $\Theta \approx 37.9°$
b. $\Theta \approx 38.9°$
c. $\Theta \approx 39.9°$
d. $\Theta \approx 36.9°$
e. $\Theta \approx 35.9°$

ANSWER: a

38. A moving conveyor is built so that it rises 1 meter for each 3 meters of horizontal travel. Select a diagram

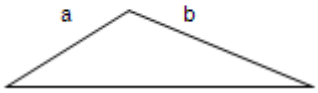
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

that gives a visual representation of the problem.

a.



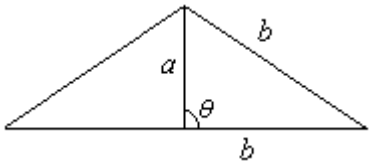
$a = 1m, b = 3m$

b.



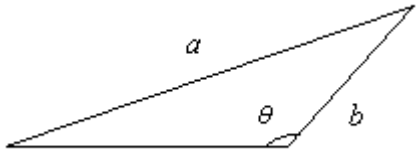
$a = 1m, b = 3m$

c.



$a = 1m, b = 3m$

d.



$a = 1m, b = 3m$

e.



$a = 1m, b = 3m$

ANSWER: b

39. A moving conveyor is built so that it rises 9 meter for each 11 meters of horizontal travel. Find the inclination of the conveyor. Round your answer to one decimal place.

a. $\Theta \approx 40.3°$

b. $\Theta \approx 41.3°$

c. $\Theta \approx 38.3°$

d. $\Theta \approx 39.3°$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

e. $\Theta \approx 37.3°$

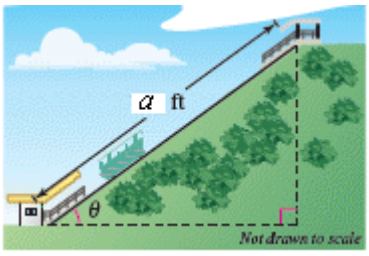
ANSWER: d

40. A moving conveyor is built so that it rises 5 meter for each 7 meters of horizontal travel. The conveyor runs between two floors in a factory. The distance between the floors is 6 meters. Find the length of the conveyor. Round your answers to one decimal place.

a. 11.3 m
b. 12.3 m
c. 9.3 m
d. 8.3 m
e. 10.3 m

ANSWER: e

41. The Falls Incline Railway in Niagara Falls, Ontario, Canada is an inclined railway that was designed to carry people from the City of Niagara Falls to Queen Victoria Park. The railway is approximately 170 feet long with a 42% uphill grade (see figure). Find the inclination Θ of the railway. Round your answer to four decimal places for radians and round your answer to one decimal place for degrees.



$a = 170$

a. $\Theta \approx 0.4151$ radian, or $23.8°$
b. $\Theta \approx 0.3802$ radian, or $21.8°$
c. $\Theta \approx 0.4325$ radian, or $24.8°$
d. $\Theta \approx 0.3976$ radian, or $22.8°$
e. $\Theta \approx 0.3627$ radian, or $20.8°$

ANSWER: d

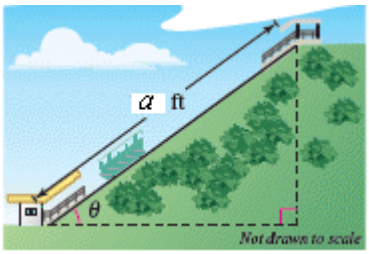
42. The Falls Incline Railway in Niagara Falls, Ontario, Canada is an inclined railway that was designed to carry people from the City of Niagara Falls to Queen Victoria Park. The railway is approximately 110 feet long with a 44% uphill grade (see figure). Find the change in elevation from the base to the top of the railway. Round your answer to one decimal place.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 6.1 Lines

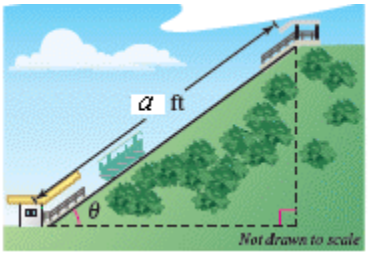


$a = 110$

a. $z \approx 44.3$ ft
b. $z \approx 45.3$ ft
c. $z \approx 43.3$ ft
d. $z \approx 46.3$ ft
e. $z \approx 42.3$ ft

ANSWER: a

43. The Falls Incline Railway in Niagara Falls, Ontario, Canada is an inclined railway that was designed to carry people from the City of Niagara Falls to Queen Victoria Park. The railway is approximately 170 feet long with a 28% uphill grade (see figure). Using the origin of a rectangular coordinate system as the base of the inclined plane, find the equation of the line that models the railway track.



$a = 170$

a. $y = 170x$
b. $y = 0.28x$
c. $y = 28x$
d. $y = -0.28x$
e. $y = -170x$

ANSWER: b

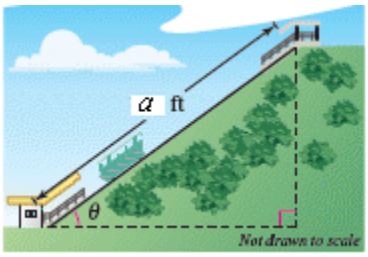
44. The Falls Incline Railway in Niagara Falls, Ontario, Canada is an inclined railway that was designed to carry people from the City of Niagara Falls to Queen Victoria Park. The railway is approximately 180 feet long with a 40% uphill grade (see figure). Select the graph of the equation of the line that models the railway track.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

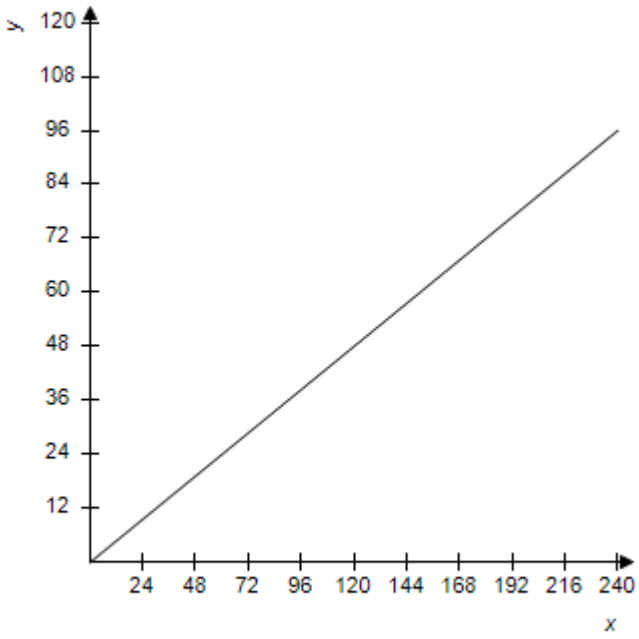
Name:_____ Class:_____ Date:_____

Section 6.1 Lines

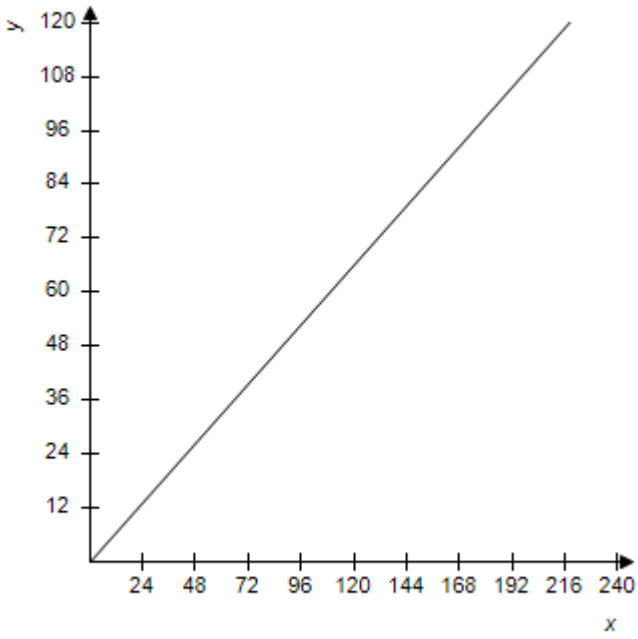


$a = 180$

a.



b.



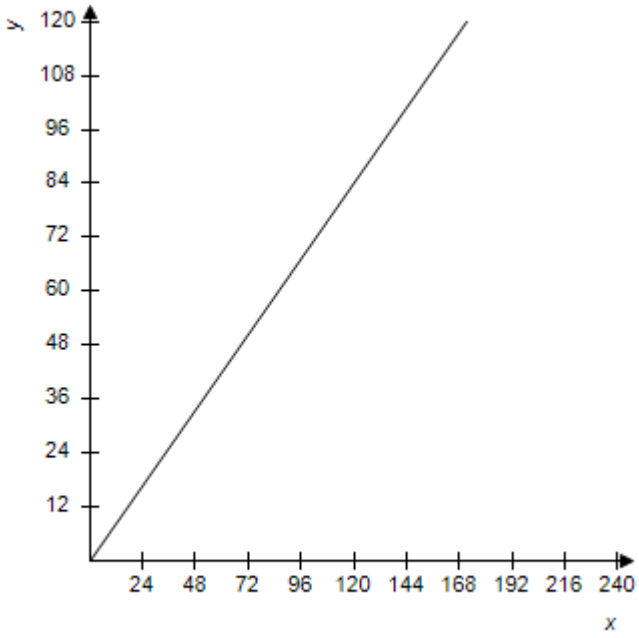
c.

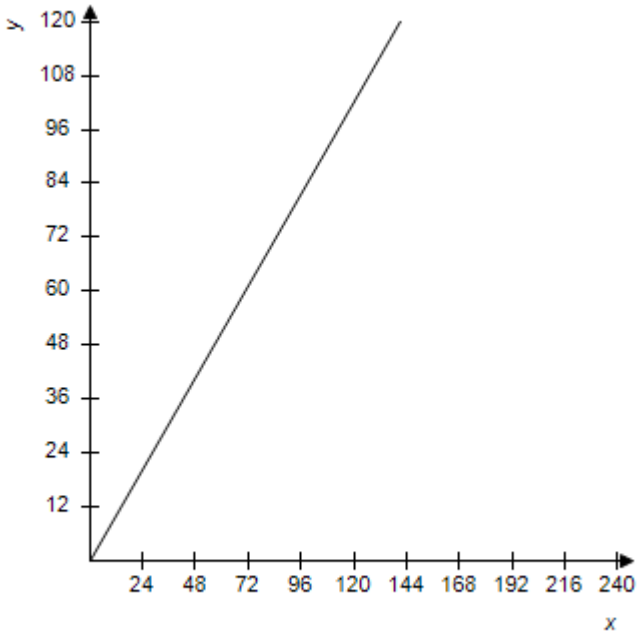
d.

Copyright Cengage Learning. Powered by Cognero.

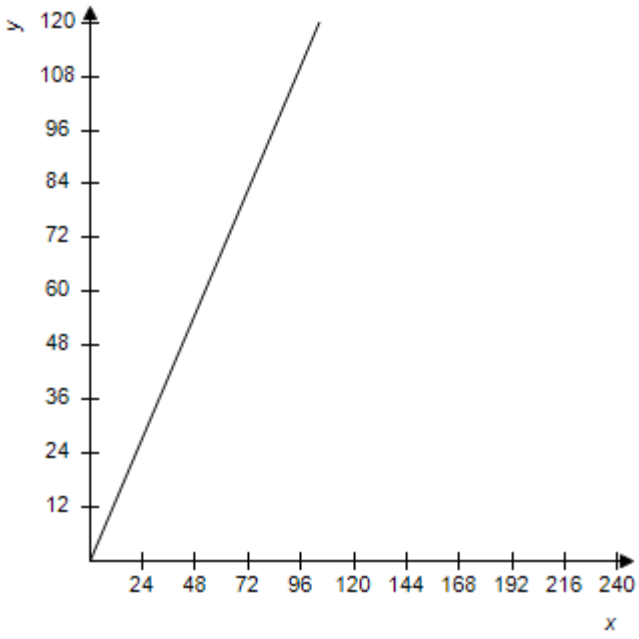
Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines





e.



ANSWER: a

45. Consider a line with slope m and y-intercept (0,4). Write the distance d between the origin and the line as a function of m.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section 6.1 Lines

a. $d = \dfrac{m}{\sqrt{m^2+4}}$

b. $d = \dfrac{1}{\sqrt{m^2-4}}$

c. $d = \dfrac{1}{\sqrt{m^2+4}}$

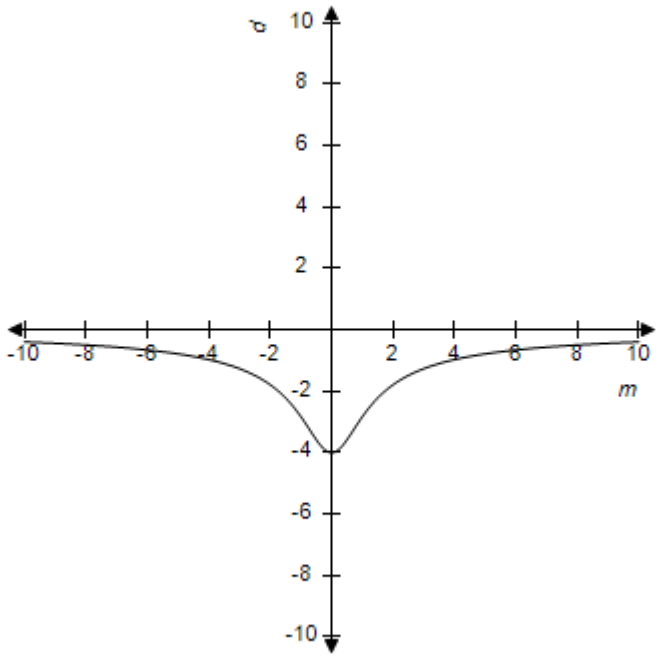
d. $d = \dfrac{4}{\sqrt{m^2-1}}$

e. $d = \dfrac{4}{\sqrt{m^2+1}}$

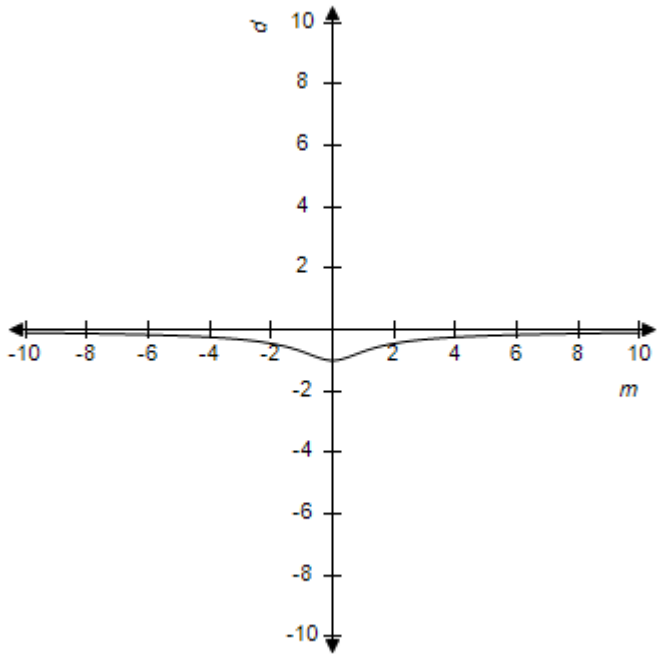
ANSWER: e

46. Consider a line with slope m and y-intercept (0,4). Select the graph of the distance between the origin and the line.

a.



b.



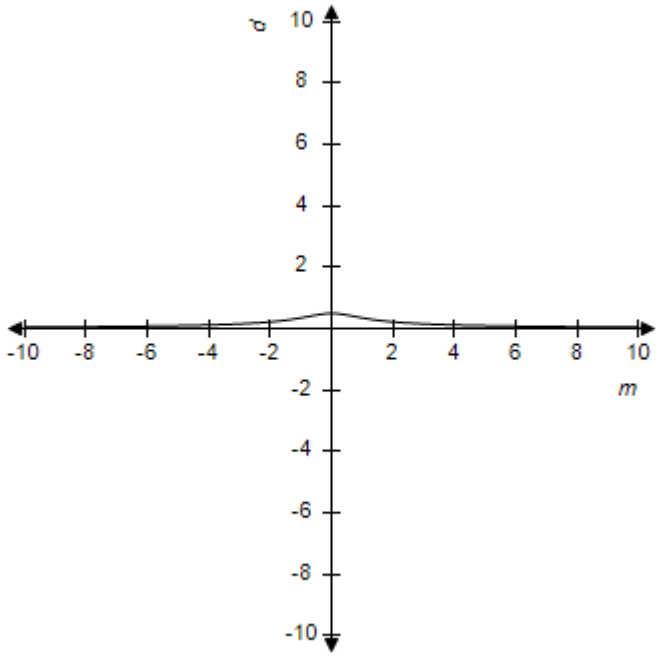
c.

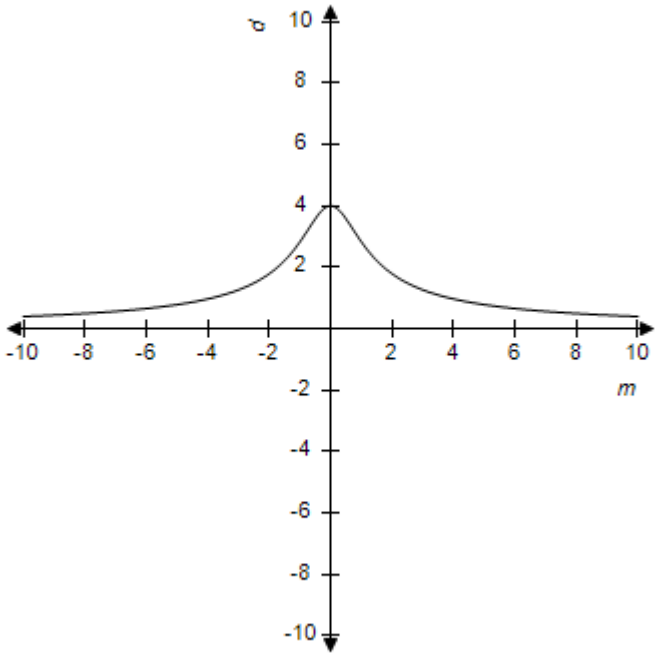
d.

Copyright Cengage Learning. Powered by Cognero.

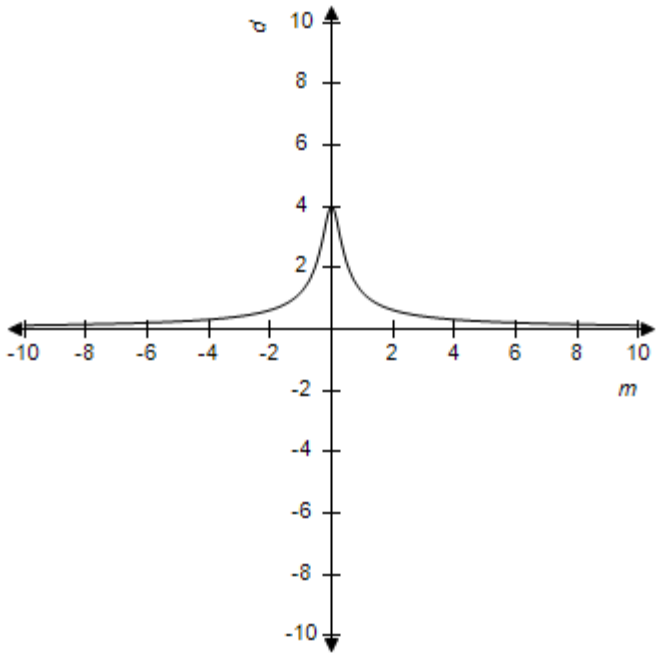
Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines





e.



ANSWER: d

47. Consider a line with slope m and y-intercept (0,8). Find the slope that yields the maximum distance between the origin and the line.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines

a. The maximum distance of $\frac{1}{8}$ occurs when the slope m is $-\frac{1}{8}$.

b. The maximum distance of 8 occurs when the slope m is 0.

c. The maximum distance of $\frac{1}{8}$ occurs when the slope m is 0.

d. The maximum distance of 9 occurs when the slope m is 8.

e. The maximum distance of 8 occurs when the slope m is $\frac{1}{8}$.

ANSWER: b

48. Consider a line with slope m and y-intercept (0,7). Write the distance d between the point (6,1) and the line as a function of m.

a. $\frac{6|m-1|}{\sqrt{m^2+1}}$

b. $\frac{6|m+1|}{\sqrt{m^2-1}}$

c. $\frac{6|m+1|}{\sqrt{m^2+1}}$

d. $\frac{6|m+6|}{\sqrt{m^2+1}}$

e. $\frac{|m+1|}{\sqrt{m^2+1}}$

ANSWER: c

49. Consider a line with slope m and y-intercept (0,6). Select the graph of the distance d between the point (5,1) and the line as a function of m.

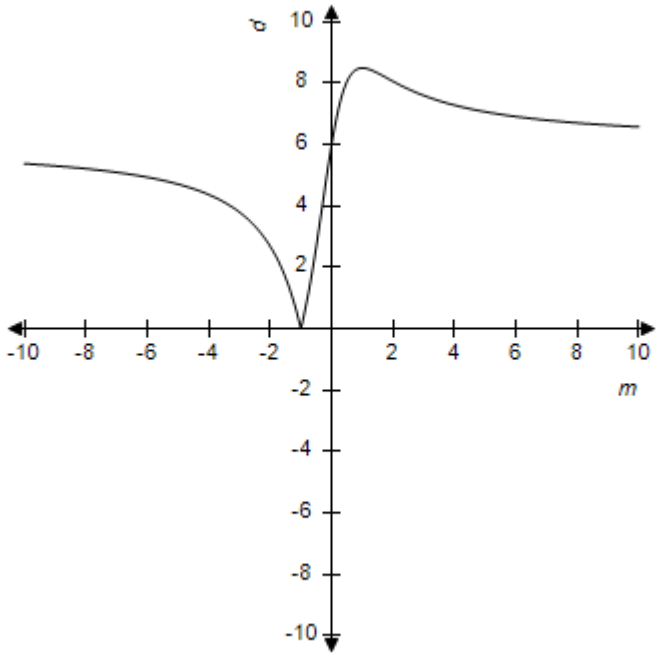
a. b.

Copyright Cengage Learning. Powered by Cognero.

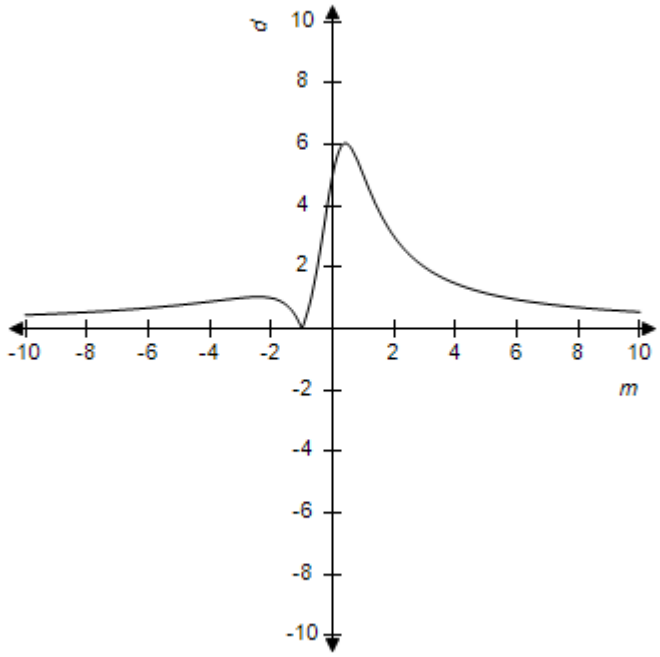
Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

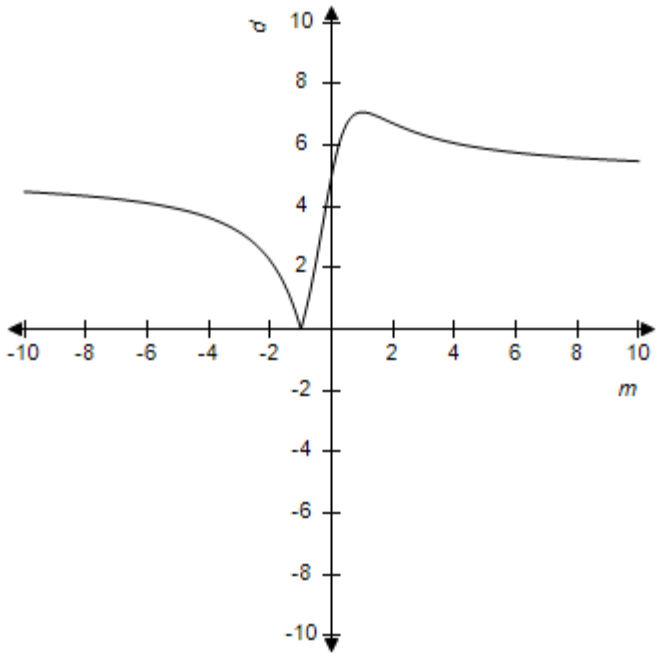
Section 6.1 Lines



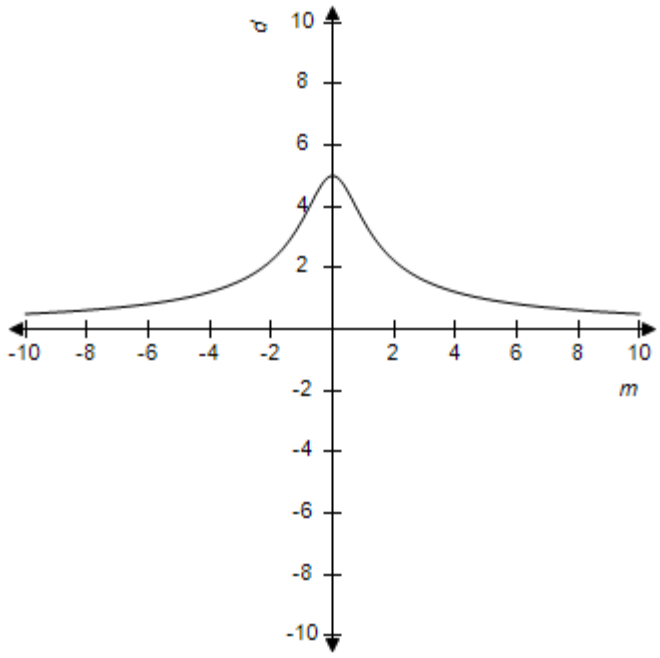
c.



d.



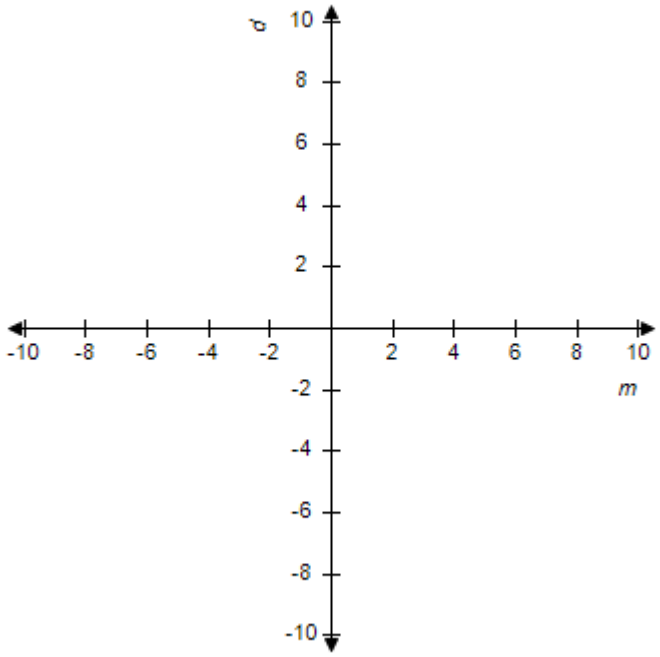
e.



Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section 6.1 Lines



ANSWER: c

50. Consider a line with slope m and y-intercept (0,4). Find the slope that yields the maximum distance between the point (3,1) and the line.

a. $m = 4$
b. $m = -1$
c. $m = 3$
d. $m = -3$
e. $m = 1$

ANSWER: e

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section P.1 Review of Real Numbers and Their Properties

1. Determine which number/s in the set is/are natural number/s.

{2.19, 0.684..., –3, 0.017174526..., 46, –49}

a. 46, –49
b. 2.19, 0.684..., –3, 46, –49
c. –3, 46, –49
d. 0.017174526...
e. 46

ANSWER: e

2. Determine which number/s in the set is/are rational number/s.

{2.3232965648..., 0.7063, –5.63, $\sqrt{2}$, –4, 1}

a. 2.3232965648..., $\sqrt{2}$
b. 1
c. –4, 1
d. –4, 1, –5.63, 0.7063
e. –4, 1, –5.63, 0.7063, $\sqrt{2}$

ANSWER: d

3. Determine which number/s in the set is/are irrational number/s.

$\left\{6, -9, -\frac{12}{5}, \sqrt{9}, 3.2, \frac{\pi}{6}, 8, -7.1, 5\right\}$

a. 6, –9, $\sqrt{9}$, 8, 5
b. 6, $\sqrt{9}$, 8, 5
c. $-\frac{12}{5}$, $\sqrt{9}$, 3.2, 6, –9, 8, –7.1, 5
d. $\frac{\pi}{6}$
e. $-\frac{12}{5}$, $\sqrt{9}$, 3.2, 6, –9, 8, –7.1, 5, $\frac{\pi}{6}$

ANSWER: d

4. Plot the following real number on the real number line.

–2.5

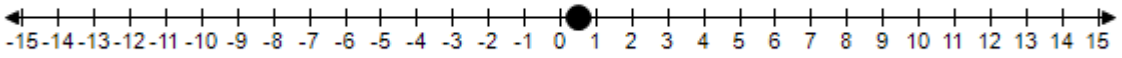
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

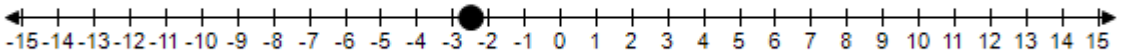
Name:_____ Class:_____ Date:_____

Section P.1 Review of Real Numbers and Their Properties

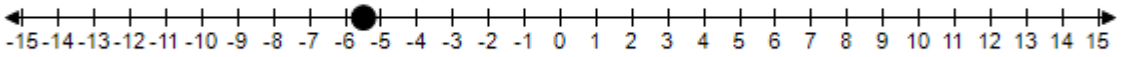
a.



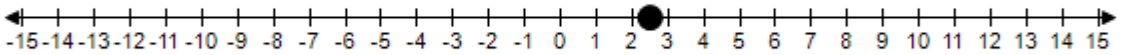
b.



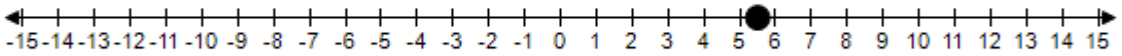
c.



d.



e.



ANSWER: b

5. Use a calculator to find the decimal form of the rational number. If it is a nonterminating decimal, write the repeating pattern.

$\frac{61}{444}$

a. $0.15\overline{990}$
b. $0.18\overline{243}$
c. $0.1\overline{486}$
d. $0.\overline{171}$
e. $0.13\overline{738}$

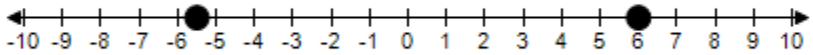
ANSWER: e

6. Approximate the numbers and place the correct symbol (< or >) between them.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

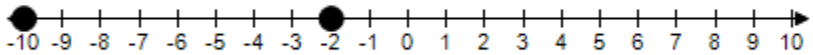
Section P.1 Review of Real Numbers and Their Properties



a. –5.5 > 6
b. –6 < 5.5
c. –5 > 6
d. –5.5 < 6
e. –5 < 6

ANSWER: d

7. Approximate the numbers and place the correct symbol (< or >) between them.



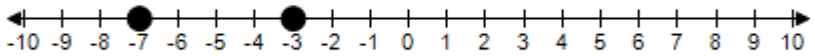
a. –10 < –2
b. –9.5 < –2.5
c. –10.5 > –2
d. –10.5 < –1.5
e. –10 > –2

ANSWER: a

8. Plot the two real numbers on the real number line. Then place the appropriate inequality symbol ($\leq$, $\geq$, =, <, or >) between them.

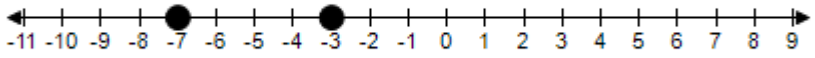
–3, –7

a.



–3 > –7

b.



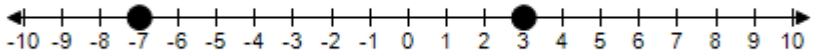
–3 ≤ –7

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

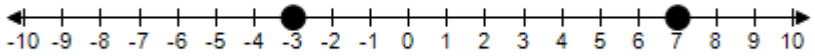
Section P.1 Review of Real Numbers and Their Properties

c.



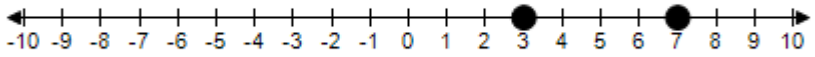
$-3 \geq -7$

d.



$-3 < -7$

e.



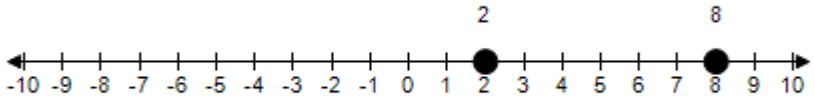
$-3 < -7$

ANSWER: a

9. Plot the two real numbers on the real number line. Then place the appropriate inequality symbol (< or >) between them.

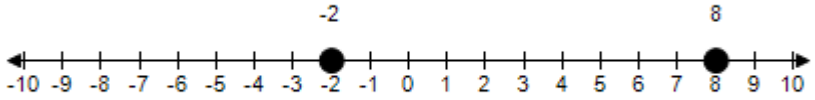
$2, \frac{16}{2}$

a.



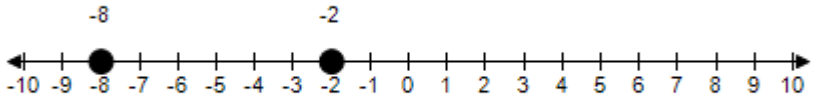
$2 < \frac{16}{2}$

b.



$2 \geq \frac{16}{2}$

c.



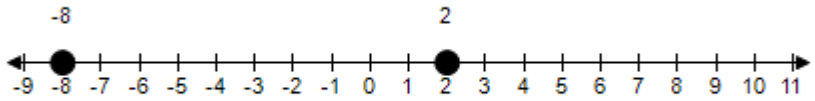
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

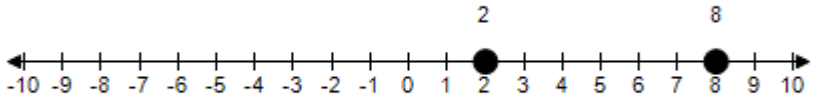
$2 \leq \frac{16}{2}$

d.



$2 \geq \frac{16}{2}$

e.



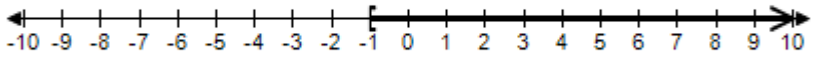
$2 > \frac{16}{2}$

ANSWER: a

10. Sketch the subset on the real number line, and state whether the interval is bounded or unbounded.

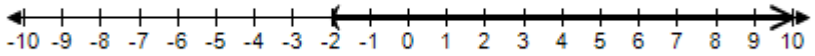
$x \geq -2$

a.



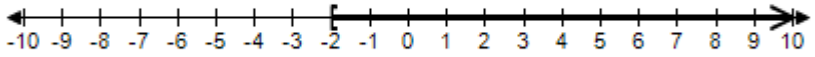
The interval is unbounded.

b.



The interval is unbounded.

c.



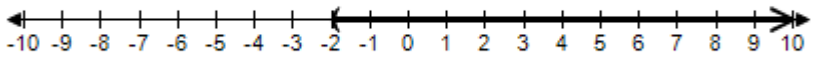
The interval is bounded.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

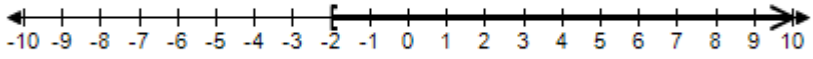
Section P.1 Review of Real Numbers and Their Properties

d.



The interval is bounded.

e.



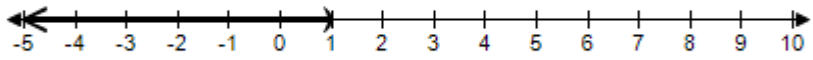
The interval is unbounded.

ANSWER: e

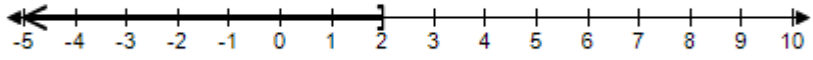
11. Give a verbal description of the subset of real numbers represented by the following inequality and sketch the subset on the real number line.

$x \leq 2$

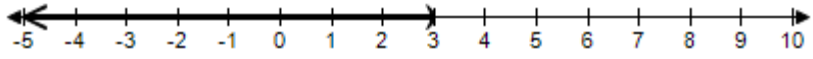
a. $x \leq 2$ denotes the set of all real numbers less than or equal to 2.



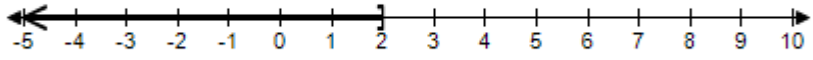
b. $x \leq 2$ denotes the set of all real numbers greater than or equal to 2.



c. $x \leq 2$ denotes the set of all real numbers less than or equal to 2.



d. $x > 2$ denotes the set of all real numbers greater than 2.

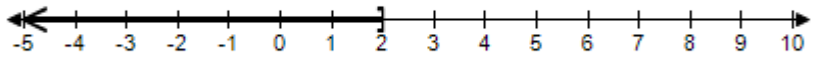


e. $x \leq 2$ denotes the set of all real numbers less than or equal to 2.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

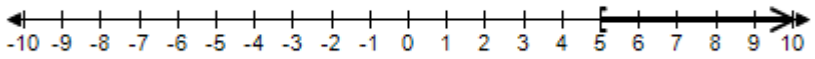


ANSWER: e

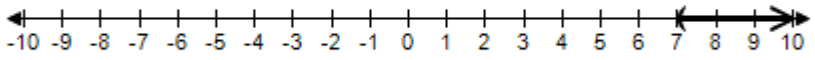
12. Give a verbal description of the subset of real numbers represented by the following interval, and sketch the subset on the real number line.

$[7, \infty)$

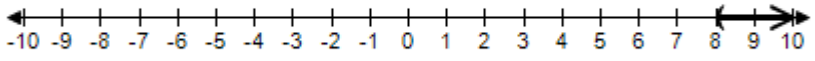
a. $[7, \infty)$ denotes the set of all real numbers less than 7.



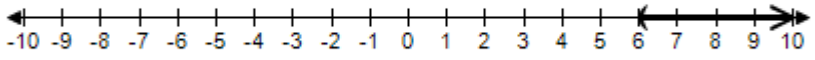
b. $[7, \infty)$ denotes the set of all real numbers less than or equal to 7.



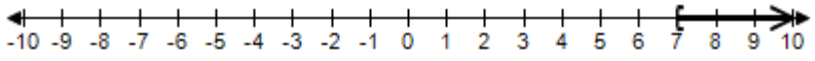
c. $[7, \infty)$ denotes the set of all real numbers greater than 7.



d. $[7, \infty)$ denotes the set of all real numbers equal to 7.



e. $[7, \infty)$ denotes the set of all real numbers greater than or equal to 7.



ANSWER: e

13. Sketch the subset on the real number line, and state whether the interval is bounded or unbounded.

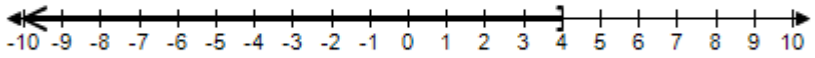
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

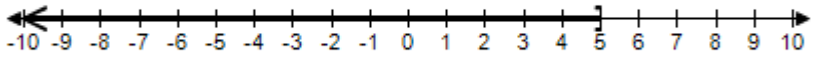
$(-\infty, 5)$

a.



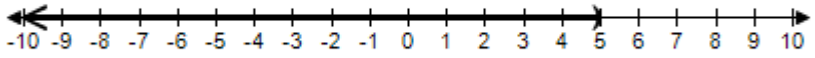
The interval is unbounded.

b.



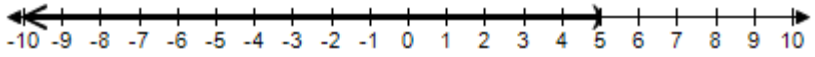
The interval is unbounded.

c.



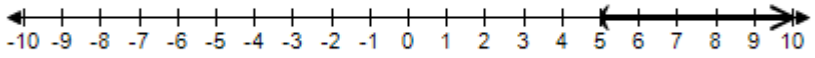
The interval is unbounded.

d.



The interval is bounded.

e.



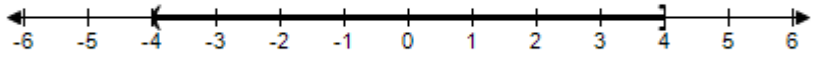
The interval is unbounded.

ANSWER: c

14. Sketch the subset on the real number line, and state whether the interval is bounded or unbounded.

$-4 < x < 4$

a.



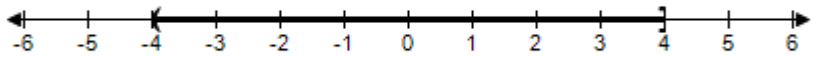
The interval is bounded.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

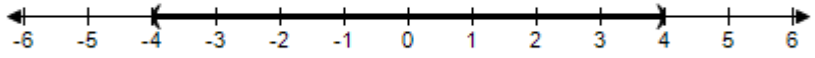
Section P.1 Review of Real Numbers and Their Properties

b.



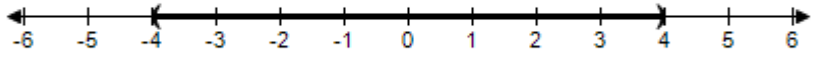
The interval is unbounded.

c.



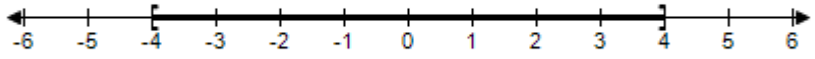
The interval is unbounded.

d.



The interval is bounded.

e.



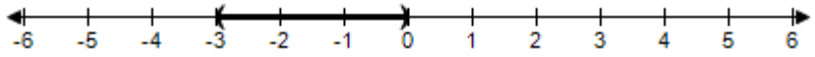
The interval is unbounded.

ANSWER: d

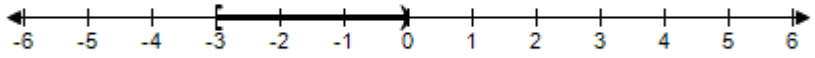
15. Give a verbal description of the subset of real numbers represented by the following inequality, and sketch the subset on the real number line.

$-3 \le x < 0$

a. $-3 \le x < 0$ denotes the set of all real numbers greater than or equal to –3 and less than or equal to 0.



b. $-3 \le x < 0$ denotes the set of all real numbers greater than or equal to –3 and less than 0.

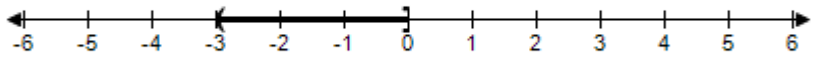


c. $-3 \le x < 0$ denotes the set of all real numbers greater than or equal to –3 and less than 0.

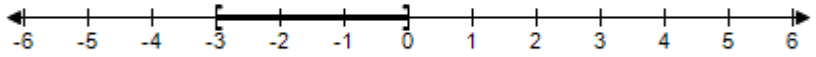
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

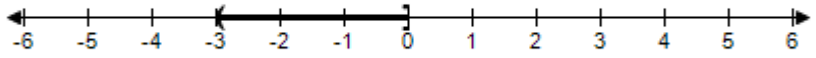
Section P.1 Review of Real Numbers and Their Properties



d. $-3 \leq x < 0$ denotes the set of all real numbers greater than or equal to –3 and less than 0.



e. $-3 \leq x < 0$ denotes the set of all real numbers less than or equal to –3 and greater than 0.

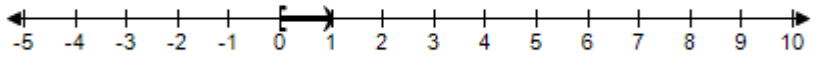


ANSWER: b

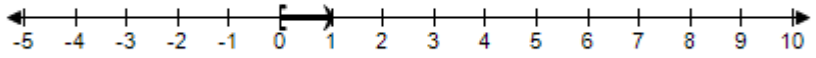
16. Give a verbal description of the subset of real numbers represented by the inequality, and sketch the subset on the real number line.

$0 < x \leq 1$

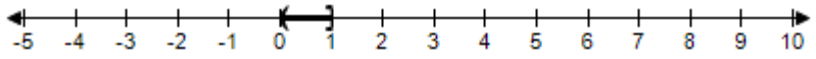
a. $0 \leq x \leq 1$ denotes the set of positive real numbers less than or equal to 1.



b. $0 < x > 1$ denotes the set of positive real numbers greater than 1.



c. $0 < x < 1$ denotes the set of positive real numbers less than 1.

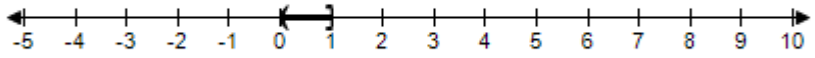


d. $0 < x \geq 1$ denotes the set of positive real numbers greater than or equal to 1.

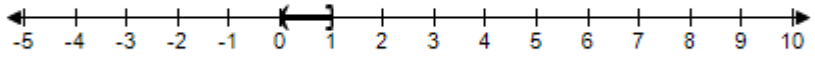
Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties



e. $0 < x \leq 1$ denotes the set of positive real numbers less than or equal to 1.

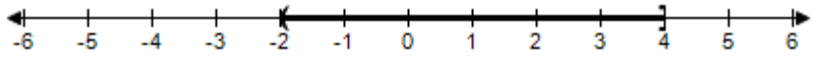


ANSWER: e

17. Sketch the subset on the real number line, and state whether the interval is bounded or unbounded.

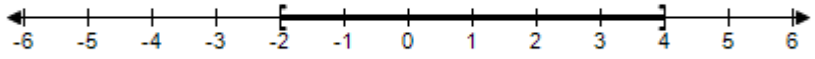
(–2, 4]

a.



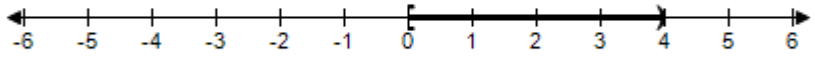
The interval is unbounded.

b.



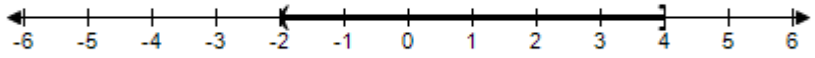
The interval is unbounded.

c.



The interval is bounded.

d.



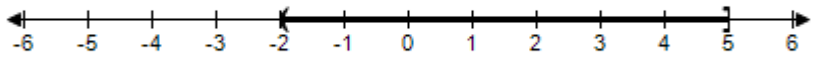
The interval is bounded.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

e.



The interval is unbounded.

ANSWER: d

18. Use inequality notation and interval notation to describe the set.

y is no more than 20.

a. Inequality : $y \leq 20$
   Interval : $(\infty, -20]$
b. Inequality : $y \leq 20$
   Interval : $(-\infty, 20]$
c. Inequality : $y \geq 20$
   Interval : $(-\infty, 20]$
d. Inequality : $y \geq 20$
   Interval : $(-\infty, -20]$
e. Inequality : $y \leq 20$
   Interval : $(\infty, 20]$

ANSWER: b

19. Use inequality notation and interval notation to describe the set.

y is at least –4 and less than 0.

a. Inequality : $-4 > y \geq 0$
   Interval : $[-4, 0)$
b. Inequality : $-4 \geq y$ and $y < 0$
   Interval : $[-4, 0)$
c. Inequality : $-4 < y < 0$
   Interval : $(-4, 0)$
d. Inequality : $-4 \leq y < 0$
   Interval : $[-4, 0)$
e. Inequality : $-4 < y < 0$
   Interval : $[-4, 0)$

ANSWER: d

20. Use inequality notation and interval notation to describe the set.

The dog's weight W is more than 52 pounds.

a. Inequality : $W > 52$
   Interval : $(52, \infty)$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

b. Inequality : $W \geq 52$
Interval : $(52, \infty)$
c. Inequality : $W \leq 52$
Interval : $(52, \infty)$
d. Inequality : $W < 52$
Interval : $(52, \infty)$
e. Inequality : $W = 52$
Interval : $(52, \infty)$

ANSWER: a

21. Use inequality notation and interval notation to describe the set.

The annual rate of inflation r is expected to be at least 3% but no more than 5%.

a. Inequality : $3\% \leq r \leq 5\%$
Interval : [3, 5]
b. Inequality : $3\% < r \leq 5\%$
Interval : [3, 5]
c. Inequality : $3\% < r < 5\%$
Interval : [3, 5]
d. Inequality : $3\% \leq r < 5\%$
Interval : [3, 5]
e. Inequality : $3\% > r > 5\%$
Interval : [3, 5]

ANSWER: a

22. Evaluate the expression.

$|-33|$

a. –33
b. 66
c. 33
d. –31
e. –34

ANSWER: c

23. Evaluate the expression.

$|2 - 10|$

a. 20
b. 8
c. –4
d. 12
e. –8

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

ANSWER: b

24. Evaluate the expression.

$|-5| - |-9|$

a. –14
b. –4
c. –12
d. 4
e. 45

ANSWER: b

25. Evaluate the expression.

$$\frac{-6}{|-6|}$$

a. –1
b. 8
c. 7
d. 1
e. 6

ANSWER: a

26. Evaluate the expression.

$-9|-9|$

a. –22
b. 72
c. –27
d. 75
e. –81

ANSWER: e

27. Evaluate the expression.

$$\frac{|x + 9|}{x + 9}, x < -9$$

a. –1
b. –3
c. –79
d. –82
e. –81

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

ANSWER: a

28. Place the correct symbol (<, >, or =) between the two real numbers.

$|-7|$ 7

a. $|-7| = 7$
b. $|-7| \geq -7$
c. $|-7| \leq -7$
d. $|-7| < 7$
e. $|-7| > 7$

ANSWER: a

29. Write the expression without absolute value symbols.

$|x - 8| + |x - 7|$, given $0 < x < 4$

a. 15
b. $2x + 1$
c. $2x - 1$
d. $2x - 15$
e. $2x + 15$

ANSWER: d

30. Place the correct symbol (<, >, or =) between the two real numbers.

$-|-7|$ $|-7|$

a. $-|-7| > |-7|$
b. $-|-7| < |-7|$
c. $-|-7| = |-7|$

ANSWER: b

31. Place the correct symbol (<, >, or =) between the two real numbers.

$-(-2)$ -2

a. $-(-2) < -2$
b. $-(-2) > -2$
c. $-(-2) = -2$

ANSWER: b

32. Find the distance between a and b.

$a = 179$, $b = 66$

a. 68
b. 115

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

c. 181
d. 245
e. 113

ANSWER: e

33. Find the distance between a and b.

$a = -\frac{3}{2}, b = 0$

a. $\frac{3}{2}$
b. $\frac{2}{3}$
c. 0
d. $-\frac{2}{3}$
e. $-\frac{3}{2}$

ANSWER: a

34. Find the distance between a and b.

$a = 9.75, b = -5.74$

a. 5.51
b. 4.51
c. 4.01
d. 15.99
e. 15.49

ANSWER: e

35. Use absolute value notation to describe the situation.

The distance between x and 8 is no more than 5.

a. $|x - 8| \geq 5$
b. $|x - 8| > 5$
c. $|x - 8| \leq 5$
d. $|x - 8| = 5$
e. $|x - 8| < 5$

ANSWER: c

36. Use absolute value notation to describe the situation.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

The distance between x and -11 is at least 3.

a. $|x + 11| > 3$
b. $|x + 11| \leq 3$
c. $|x + 11| = 3$
d. $|x + 11| < 3$
e. $|x + 11| \geq 3$

ANSWER: e

37. Use absolute value notation to describe the situation.

The temperature in Bismarck, North Dakota was 64°F at noon, then 26°F at midnight. What was the change in temperature over the 12-hour period?

a. $|64°F - 26°F| \geq -38°F$
b. $|64°F - 26°F| = 38°F$
c. $|64°F - 26°F| \leq -38°F$
d. $|64°F - 26°F| < 38°F$
e. $|64°F - 26°F| > 38°F$

ANSWER: b

38. The accounting department of a sports drink bottling company is checking to see whether the actual expenses of a department differ from the budgeted expenses by more than \$500 or by more than 5%. Fill in the missing parts of the table, and determine whether each actual expense passes the "budget variance test."

	Bubget Expense, b	Actual Expense, a	$\|a - b\|$	$0.05b$
Taxes	\$37640	\$37740		

a. Taxes: $|a - b| = 100$, $0.05b = 50$
Because the difference between the actual expense and the budget is less than \$500 and greater than 5% of budgeted amount there is compliance with the budget variance test.
b. Taxes: $|a - b| = 100$, $0.05b = 1882$
Because the difference between the actual expense and the budget is greater than \$500 and greater than 5% of budgeted amount there is compliance with the budget variance test.
c. Taxes: $|a - b| = 100$, $0.05b = 1882$
Because the difference between the actual expense and the budget is less than \$500 and less than 5% of budgeted amount there is compliance with the budget variance test.
d. Taxes: $|a - b| = 100$, $0.05b = 1882$
Because the difference between the actual expense and the budget is \$500 and greater than 5% of budgeted amount there is compliance with the budget variance test.
e. Taxes: $|a - b| = 100$, $0.05b = 1882$
Because the difference between the actual expense and the budget is greater than \$500 and less than 5% of budgeted amount there is compliance with the budget variance test.

ANSWER: c

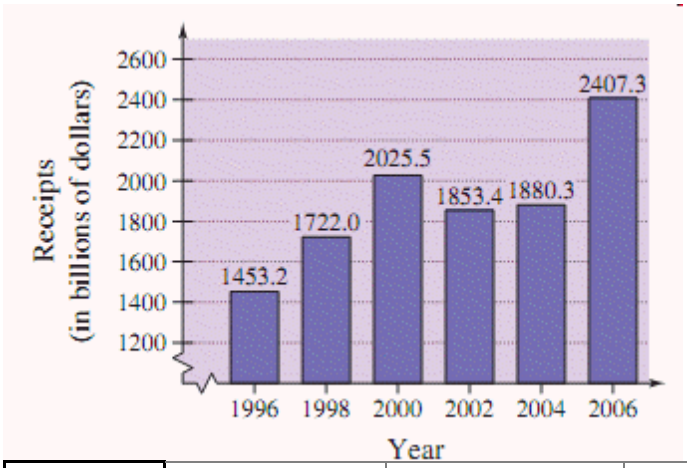
39. Use the bar graph, which shows the receipts of the federal government (in billions of dollars) for selected years from 1996 through 2006. In this exercise you are given the expenditures of the federal government. Find

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

the magnitude of the surplus or deficit for the year 1998.
(Source: U.S. Office of Management and Budget)



Year	*Receipts*	*Expenditures*	*|Receipts – Expenditures|*
1998		1652.7	

a.

Year	*Receipts*	*Expenditures*	*|Receipts – Expenditures|*
1998	1722	1652.7	69.3

b.

Year	*Receipts*	*Expenditures*	*|Receipts – Expenditures|*
1998	1722	1652.7	239

c.

Year	*Receipts*	*Expenditures*	*|Receipts – Expenditures|*
1998	1722	1652.7	536.3

d.

Year	*Receipts*	*Expenditures*	*|Receipts – Expenditures|*
1998	1722	1652.7	206.3

e.

Year	*Receipts*	*Expenditures*	*|Receipts – Expenditures|*
1998	1722	1652.7	336.3

ANSWER: a

40. Identify the terms. Then identify the coefficients of the variable terms of the expression.

$8x + 3$

a. $8x$ and 3 are the terms; 8 is the coefficient.
b. $8x$ and 3 are the terms; –3 is the coefficient.
c. $8x$ and 3 are the terms; –8 is the coefficient.
d. $8x$ and 3 are the terms; 3 is the coefficient.
e. 8 and 3 are the terms; 8 is the coefficient.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

ANSWER: a

41. Identify the terms. Then identify the coefficients of the variable terms of the expression.
$\sqrt{3}x^2 - 3x - 5$

a. $\sqrt{3}x^2$, $-3x$, and 5 are the terms; $\sqrt{3}$ and 3 are the coefficients.
b. $\sqrt{3}x^2$, $3x$, and 5 are the terms; $\sqrt{3}$ and –3 are the coefficients.
c. $\sqrt{3}x^2$, $-3x$, and –5 are the terms; $\sqrt{3}$ and 3 are the coefficients.
d. $\sqrt{3}x^2$, $-3x$, and –5 are the terms; $\sqrt{3}$ and –3 are the coefficients.
e. $\sqrt{3}x^2$, $3x$, and –5 are the terms; $\sqrt{3}$ and 3 are the coefficients.

ANSWER: d

42. Identify the terms. Then identify the coefficients of the variable terms of the expression.
$6x^4 - \frac{x^2}{7}$

a. $6x^4$ and $\frac{x^2}{7}$ are the terms; 6 and $-\frac{1}{7}$ are the coefficients.
b. $6x^4$ and $-\frac{x^2}{7}$ are the terms; 6 and $-\frac{1}{7}$ are the coefficients.
c. $6x$ and $-\frac{x^2}{7}$ are the terms; 6 and $\frac{1}{7}$ are the coefficients.
d. $6x^4$ and $-\frac{x^2}{7}$ are the terms; –6 and $-\frac{1}{7}$ are the coefficients.
e. $6x^4$ and $\frac{x^2}{7}$ are the terms; 6 and $\frac{1}{7}$ are the coefficients.

ANSWER: b

43. Evaluate the expression for the value of $x = -4$.

$4x - 2$

a. –16
b. 18
c. –19
d. –18
e. 16

ANSWER: d

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

44. Evaluate the expression for the value of $x = -2$.

$x^2 - 5x + 1$

a. –5
b. –15
c. 15
d. 5
e. –2

ANSWER: c

45. Identify the rule(s) of algebra illustrated by the statement.

$x + 3 = 3 + x$

a. Additive Identity Property.
b. Associative Property of Addition.
c. Commutative Property of Addition.
d. Additive Inverse Property.
e. Distributive Property.

ANSWER: c

46. Identify the rule(s) of algebra illustrated by the statement.

$x(6y) = (x \cdot 6)y = (6x)y$

a. Additive Identity Property.
b. Distributive Property.
c. Multiplicative Identity Property.
d. Associative and Commutative Properties of Multiplication.
e. Multiplicative Inverse Property.

ANSWER: d

47. Simplify the variable expression below.

$\frac{1}{2}a - \frac{7}{5}a$

a. $\frac{9}{10}a$
b. $-\frac{19}{10}a$
c. $\frac{19}{10}a$
d. $-\frac{5}{9}a$
e. $-\frac{9}{10}a$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

ANSWER: e

48. Perform the operation(s). (Write fractional answers in simplest form.)

$$\frac{9}{11} - \frac{5}{11}$$

a. 4
b. $\frac{5}{9}$
c. 9
d. $\frac{14}{5}$
e. $\frac{4}{11}$

ANSWER: e

49. Perform the operation(s). (Write fractional answers in simplest form.)

$$9 \div \frac{1}{6}$$

a. 54
b. $\frac{3}{2}$
c. 15
d. $\frac{2}{3}$
e. 3

ANSWER: a

50. Use a calculator to complete the table and using the table make a conjecture about the value of 5 / *n* as *n* approaches 0.

n	1	0.5	0.01	0.001	0.000001
5 / *n*					

a.

n	1	0.5	0.01	0.001	0.000001
5 / *n*	10	5	5,000	500	5,000,000

The value of 5 / *n* approaches infinity as *n* approaches 0.

b.

n	1	0.5	0.01	0.001	0.000001
5 / *n*	5	10	500	5,000	5,000,000

The value of 5 / *n* approaches infinity as *n* approaches 0.

c.

n	1	0.5	0.01	0.001	0.000001

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

$5 / n$	5	500	10	5,000,000	5,000

The value of $5 / n$ approaches 0 as n increases without bound.

d.

n	1	0.5	0.01	0.001	0.000001
$5 / n$	10	5	500	5,000	5,000,000

The value of $5 / n$ approaches infinity as n approaches 0.

e.

n	1	0.5	0.01	0.001	0.000001
$5 / n$	5	500	10	5,000	5,000,000

The value of $5 / n$ approaches 0 as n increases without bound.

ANSWER: b

51. Determine which numbers in the set are natural numbers.
$-6, 17, 3, \sqrt{64}, 0, -9, \sqrt{50}$

a. $17, 3, \sqrt{64}, 0, \sqrt{50}$

b. 17, 3, 0

c. $17, 3, \sqrt{64}$

d. 17, 3

e. –6, 17, 3, 0, –9

ANSWER: d

52. Determine which numbers in the set are whole numbers.
$18, -6, 0, \frac{20}{5}, -20, 6, \frac{11}{12}$

a. $18, 0, \frac{20}{5}, 6$

b. 18, 0, 6

c. $18, 0, \frac{20}{5}, 6, \frac{11}{12}$

d. 18, –6, 0, –20, 6

e. 18, 6

ANSWER: a

53. Determine which numbers in the set are integers.
$-0.31, 18, -6\pi, 0, 7.0, -20$

a. 18, 0, –20

b. 18, 0, 7.0, –20

c. $18, -6\pi, 0, -20$

d. 18, 0

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

e. –0.31, 18, 0, 7.0, –20

ANSWER: b

54. Determine which numbers in the set are rational numbers.

–3.8383..., –20, $\frac{7}{8}\pi$, $\sqrt{5}$, $\frac{7}{2}$, 4.060060006..., $\sqrt{36}$

a. –3.8383..., –20, $\frac{7}{2}$, $\sqrt{36}$

b. –3.8383..., –20, $\frac{7}{2}$, 4.060060006...

c. –3.8383..., –20, $\frac{7}{8}\pi$, $\frac{7}{2}$

d. –20, $\sqrt{5}$, $\frac{7}{2}$, $\sqrt{36}$

e. –3.8383..., –20, $\frac{7}{2}$, 4.060060006..., $\sqrt{36}$

ANSWER: a

55. Determine which numbers in the set are irrational numbers.

8.444..., $\frac{\sqrt{50}}{7}$, 0, $-\frac{24\pi}{7}$, $\sqrt{49}$, –3.010110111..., 4π

a. $\frac{\sqrt{50}}{7}$, 0, $-\frac{24\pi}{7}$, $\sqrt{49}$, 4π

b. 8.444..., $\frac{\sqrt{50}}{7}$, $-\frac{24\pi}{7}$, $\sqrt{49}$, –3.010110111..., 4π

c. $\frac{\sqrt{50}}{7}$, $-\frac{24\pi}{7}$, –3.010110111..., 4π

d. $\frac{\sqrt{50}}{7}$, $-\frac{24\pi}{7}$, 4π

e. $\frac{\sqrt{50}}{7}$, $-\frac{24\pi}{7}$, $\sqrt{49}$, 4π

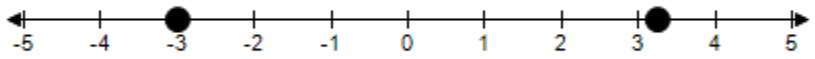
ANSWER: c

56. Approximate the numbers and place the correct symbol (< or >) between them.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

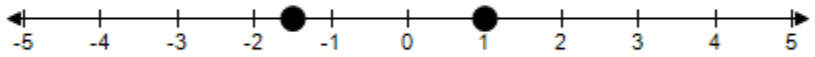
Section P.1 Review of Real Numbers and Their Properties



a. $-3 > 3.25$
b. $-3 < -3.25$
c. $-3 < 3.75$
d. $-3 > 3.75$
e. $-3 < 3.25$

ANSWER: e

57. Approximate the numbers and place the correct symbol (< or >) between them.

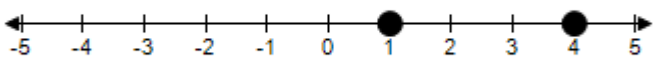


a. $-1\frac{1}{2} < -1$
b. $1\frac{1}{2} > -1$
c. $-1\frac{1}{2} > 1$
d. $-2\frac{1}{2} > -1$
e. $-1\frac{1}{2} < 1$

ANSWER: e

58. Plot the two real numbers on the real number line. Then place the appropriate inequality symbol (< or >) between them.
4, 1

a.



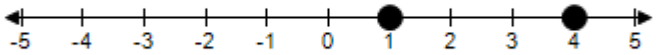
$4 > 1$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

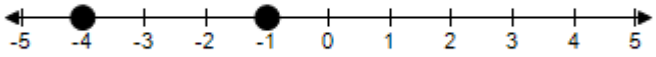
Section P.1 Review of Real Numbers and Their Properties

b.



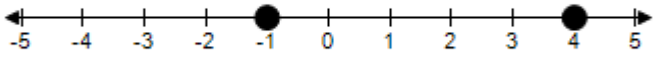
$4 < 1$

c.



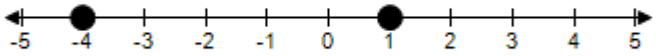
$4 < 1$

d.



$1 < 4$

e.



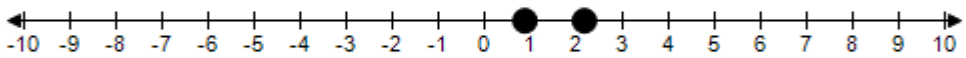
$4 < 1$

ANSWER: a

59. Plot the two real numbers on the real number line. Then place the appropriate inequality symbol (< or >) between them.

$\frac{7}{8}, \frac{13}{6}$

a.



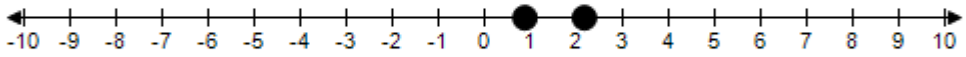
$\frac{7}{8} < \frac{13}{6}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

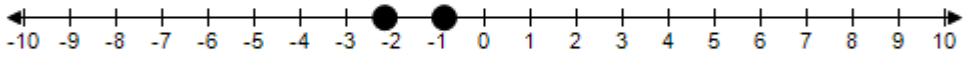
Section P.1 Review of Real Numbers and Their Properties

b.



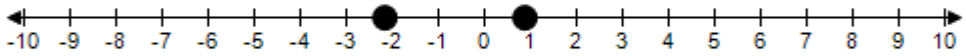
$\frac{7}{8} > \frac{13}{6}$

c.



$\frac{7}{8} > \frac{13}{6}$

d.



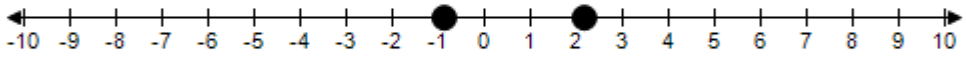
$\frac{7}{8} < \frac{13}{6}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

e.



$\frac{7}{8} > \frac{13}{6}$

ANSWER: a

60. Is the interval bounded or unbounded?
$1 < x < 5$

a. bounded

b. unbounded

ANSWER: a

61. Use inequality notation to describe the set.
n is positive

a. $n > 0$

b. $n \geq 0$

c. $n \leq 0$

d. $n < \infty$

e. $n \leq \infty$

ANSWER: a

62. Use inequality notation to describe the set.
t is at least 12 but less than 18

a. $12 \leq t \leq 18$

b. $12 \leq t < 18$

c. $18 \leq t < 12$

d. $18 < t \leq 12$

e. $12 < t < 18$

ANSWER: b

63. Evaluate the expression.
$|3 - 9|$

a. 6

b. 12

c. 27

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

d. –6

e. –12

ANSWER: a

64. Evaluate the expression.

$\frac{x + 8}{|x + 8|}, x < -8$

a. 8

b. –1

c. 1

d. x

e. $-x$

ANSWER: b

65. Place the correct symbol (<, >, or =) between the pair of real numbers.

$-|6| \quad -|-6|$

a. $-|6| < -|-6|$

b. $-|6| > -|-6|$

c. $-|6| = -|-6|$

ANSWER: c

66. Place the correct symbol (<, >, or =) between the pair of real numbers.

$-(-5) \quad -5$

a. $-(-5) < -5$

b. $-(-5) = -5$

c. $-(-5) > -5$

ANSWER: c

67. Use absolute value notation to describe the situation.
The distance between y and –1 is no less than 4.

a. $|y - 1| \geq 4$

b. $|y - 1| \leq 4$

c. $|y - 1| < 4$

d. $|y + 1| > 4$

e. $|y + 1| \geq 4$

ANSWER: e

68. Use absolute value notation to describe the situation.
x is more than three units from 9.

a. $|x - 9| > 3$

b. $|x - 9| \leq 3$

c. $|x - 9| < 3$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

d. $|x + 9| > 3$

e. $|x + 9| \geq 3$

ANSWER: a

69. Use absolute value notation to describe the situation.
The elevation at the bottom of a mountain is 433 feet above sea level. The elevation at the top of the mountain is 1,969 feet above sea level. What is the height of the mountain?

a. $|433| + |1{,}969|$

b. $|433| - |1{,}969|$

c. $-|433| - |1{,}969|$

d. $|433 + 1{,}969|$

e. $|433 - 1{,}969|$

ANSWER: e

70. List the terms of the expression:

$-10v^2 - \frac{5}{11}v + 6$

a. $-10v^2, -\frac{5}{11}v$

b. v^2, v

c. $-10, -\frac{5}{11}, 6$

d. $-10v^2, -\frac{5}{11}v, 6$

e. $-10v^2$

ANSWER: d

71. List the coefficients of the variable terms in the expression:
$4\sqrt{7}\,n^2 - 13\,n - 15$

a. $4\sqrt{7}, -13, -15$

b. $4\sqrt{7}\,n^2$

c. $4\sqrt{7}\,n^2, -13\,n, -15$

d. $4\sqrt{7}$

e. $4\sqrt{7}, -13$

ANSWER: e

72. Evaluate the expression for the given value of x.
expression: $x^2 - 6x + 7$ value: $x = -3$

a. 19

b. 34

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

c. 16
d. 22
e. 7

ANSWER: b

73. Evaluate the expression for the given value of x.

expression: $\frac{x+4}{x-4}$ value: $x = -4$

a. $-\frac{1}{4}$
b. $\frac{1}{4}$
c. 0
d. not possible since numerator is 0
e. not possible since denominator is 0

ANSWER: c

74. Identify the rule of algebra illustrated by the statement.
$-3r + 4r = (-3 + 4)r$

a. associative property of addition
b. commutative property of addition
c. associative property of multiplication
d. commutative property of multiplication
e. distributive property

ANSWER: e

75. Identify the rules of algebra illustrated from left to right by the following statement.
$(w + 8) - 8 = w + (8 - 8) = w + 0 = w$

a. commutative property of addition; additive inverse property; additive identity property
b. associative property of addition; additive inverse property; additive identity property
c. commutative property of addition; additive identity property; additive inverse property
d. associative property of addition; additive identity property; additive inverse property
e. distributive property; additive identity property; additive inverse property

ANSWER: b

76. Identify the rules of algebra illustrated from left to right by the following statement.
$\frac{1}{3}(3y) = \left(\frac{1}{3} \cdot 3\right)y = 1 \cdot y = y$

a. associative property of multiplication; multiplicative inverse property; multiplicative identity property
b. commutative property of multiplication; multiplicative inverse property; multiplicative identity

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

property

c. associative property of multiplication; multiplicative identity property; multiplicative inverse property

d. commutative property of multiplication; multiplicative identity property; multiplicative inverse property

e. distributive property; multiplicative identity property; multiplicative inverse property

ANSWER: a

77. Evaluate the following expression.

$4^2 \cdot 4$

a. 36

b. 68

c. 216

d. 67

e. 64

ANSWER: e

78. Evaluate the following expression.

$$\frac{10^5}{10^2}$$

a. 1,004

b. 1,000

c. 1,002

d. 1,003

e. 1,001

ANSWER: b

79. Evaluate the following expression.

$(4^3)^0$

a. 81

b. 1

c. –1

d. 0

e. – 256

ANSWER: b

80. Evaluate the following expression.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section P.1 Review of Real Numbers and Their Properties

$$\left(-\frac{6}{11}\right)^3\left(\frac{11}{6}\right)^2$$

a. $-\frac{6}{11}$

b. $-\frac{7}{12}$

c. $-\frac{11}{6}$

d. $-\frac{12}{7}$

e. $\frac{6}{11}$

ANSWER: a

81. Evaluate the following expression.

$$\frac{8\cdot 12^{-2}}{6^{-2}\cdot 12^{-1}}$$

a. 24

b. $\frac{9}{2}$

c. 4

d. $\frac{1}{9}$

e. $\frac{1}{24}$

ANSWER: a

82. Evaluate the expression below.

2^{-3}

a. $\frac{1}{8}$

b. $\frac{1}{2}$

c. 32

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

d. $\frac{1}{32}$

e. 8

ANSWER: a

83. Evaluate the expression for the given value of x.

$-2x^3,\ x = 4$

a. 32
b. –128
c. –8
d. 128
e. –32

ANSWER: b

84. Evaluate the expression for the given value of x.

$15\left(x^{-2}\right),\ x = 5$

a. –3
b. 3
c. $\frac{3}{5}$
d. $-\frac{1}{3}$
e. $\frac{15}{26}$

ANSWER: c

85. Evaluate the expression for the given value of x.

$-7x^0,\ x = 20$

a. –140
b. –7
c. 140
d. 7
e. 49

ANSWER: b

86. Evaluate $4s^3t^2$ when $s = -4$ and $t = -1$.

a. 16

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

b. –256
c. 4,096
d. 256
e. –64

ANSWER: b

87. Evaluate the expression for the given value of x.

$7(x^3), \quad x = -3$

a. 189
b. 27
c. –27
d. 21
e. –189

ANSWER: e

88. Evaluate the expression for the given value of x.

$10(-x^3), \quad x = -\frac{1}{5}$

a. $-\frac{2}{5}$
b. $-\frac{25}{2}$
c. –2
d. $\frac{2}{25}$
e. $\frac{5}{2}$

ANSWER: d

89. Simplify the following expression.

$8x^2(x^3)$

a. $8x^5$
b. $8x^4$
c. $8x^6$
d. $8x^7$
e. $8x^3$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

ANSWER: a

90. Simplify the following expression.

$4y^2(2y^0)^2$

a. $2y^2$
b. $5y^2$
c. $16y^2$
d. $4y^2$
e. $8y^2$

ANSWER: c

91. Write the following exponential expression in simplest form.

$\frac{19n^8w^{15}}{24n^{14}w^6}$

a. $\frac{19n^6}{24w^9}$
b. $\frac{24n^{22}}{19w^{21}}$
c. $\frac{24n^6}{19w^9}$
d. $\frac{19w^9}{24n^6}$
e. $\frac{19w^9}{24n^{22}}$

ANSWER: d

92. Simplify the following expression.

$\frac{2(x+y)^3}{7(x+y)}$

a. $\frac{2}{7}(x+y)^2$
b. $\frac{2}{7}(x+y)$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

c. $\frac{7}{2}(x+y)$

d. $\frac{2}{7}(x+y)^3$

e. $\frac{7}{2}(x+y)^2$

ANSWER: a

93. Write the exponential expression below in simplest form.

$$\left(\frac{4a^2b^4}{7a^5b^3}\right)^3$$

a. $\frac{4b^9}{7a^3}$

b. $\frac{4b}{7a^3}$

c. $\frac{64b^3}{343a^9}$

d. $\frac{4b^3}{7a^9}$

e. $\frac{64b^9}{343a^3}$

ANSWER: c

94. Simplify the following expression.

$$(3x^3z^3)^5(3x^3z^3)^{-5}$$

a. 1

b. x^3y^3

c. $(9x^3z^3)^5$

d. 9

e. $9x^3z^3$

ANSWER: a

95. Simplify.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

$(x + 5)^0, x \neq -5$

a. 1
b. $(x + 5)$
c. 5
d. $\frac{1}{(x+5)}$
e. 0

ANSWER: a

96. Write the number in scientific notation.

18,000.4

a. 1.80004×10^2
b. $18{,}000.4 \times 10^2$
c. $18{,}000.4 \times 10^4$
d. 1.80004×10^4
e. 1.80004×10^3

ANSWER: d

97. Write the number in scientific notation.

19,000,000

a. 1.9×10^{-5}
b. 1.9×10^6
c. 1.9×10^5
d. 1.9×10^{-7}
e. 1.9×10^7

ANSWER: e

98. Write the number in scientific notation.

– 0.00025

a. -2.5×10^{-4}
b. -2.5×10^2
c. 2.5×10^3
d. -0.00025×10^4
e. 0.00025×10^2

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

99. Write the number in scientific notation.

0.00001937 inch.

a. 1.937×10^{2} in
b. 0.00001937×10^{4} in
c. 1.937×10^{-5} in
d. 1.937×10^{3} in
e. 1.937×10^{-4} in

ANSWER: c

100. Write the number in decimal notation.

3.25×10^{5}

a. 32,500
b. 3,250,000
c. 325
d. 3,250
e. 325,000

ANSWER: e

101. Change the following number from scientific notation to decimal notation.

2.02×10^{-2}

a. 0.0202
b. 202
c. 20.2
d. 2.02
e. 0.202

ANSWER: a

102. Write the number in decimal notation.

-7.718×10^{-3}

a. – 0.007718
b. 0.7718
c. – 0.07718
d. 0.007718
e. – 0.0007718

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

103. Write the number in decimal notation.

Temperature: 1.7×10^7 degrees Celsius

a. 1,700,000°C
b. 17,000,000°C
c. 170,000°C
d. 17,000°C
e. 1,700°C

ANSWER: b

104. Write the number in decimal notation.

Gross domestic product of the United States: 5.3743021×10^{13} dollars

a. $53,743,021,000,000
b. $5,374,302,100,000
c. $53,743,021,000
d. $537,430,210,000
e. $537,430,210,000,000

ANSWER: a

105. Evaluate the following expression without using a calculator.

$$(1.6 \times 10^7)(6.0 \times 10^{-3})$$

a. 9.6×10^4
b. 9.6×10^{-3}
c. 9.6×10^7
d. 9.6×10^{-7}
e. 9.6×10^{-4}

ANSWER: a

106. Evaluate the following expression without using a calculator. (Round to the tenth decimal place).

$$\frac{10.0 \times 10^8}{5.0 \times 10^{-3}}$$

a. 2.0×10^{-4}
b. 2.0×10^{-5}
c. 2.0×10^{11}

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

d. 2.0×10^{9}

e. 2.0×10^{-9}

ANSWER: c

107. Use the properties of radicals to simplify completely the following expression.

$\sqrt[5]{160x^5}$

a. $2\left(\sqrt[5]{5x}\right)$

b. $\left(\sqrt[5]{5x}\right)$

c. $2\left(\sqrt[5]{5x^5}\right)$

d. $\left(\sqrt[5]{5}\right)$

e. $2\left(\sqrt[5]{5}\right)$

ANSWER: a

108. Simplify the following radical expression.

$\sqrt{24}$

a. $2\sqrt{6}$

b. $\sqrt{24}$

c. $\sqrt{6}$

d. $3\sqrt{6}$

e. $4\sqrt{6}$

ANSWER: a

109. Simplify the following radical expression.

$\sqrt[5]{486p^6q^7}$

a. $3p^5q^4\left(\sqrt[5]{2q}\right)$

b. $2pq^2\left(\sqrt[5]{3pq}\right)$

c. $3p^2q\left(\sqrt[5]{2pq}\right)$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

d. $3\left(\sqrt[5]{2pq^2}\right)$

e. $3pq\left(\sqrt[5]{2pq^2}\right)$

ANSWER: e

110. Complete the following statement using the appropriate symbol.

$\sqrt{5} + \sqrt{6} ____ \sqrt{5 + 6}$

a. >
b. =
c. <
d. ≤
e. ≥

ANSWER: a

111. Complete the following statement using the appropriate symbol.

$\sqrt{\frac{4}{7}} ____ \frac{\sqrt{4}}{\sqrt{7}}$

a. =
b. <
c. >

ANSWER: a

112. Complete the following statement using the appropriate symbol.

$25 ____ \sqrt{5^2 + 2^2}$

a. =
b. >
c. <
d. ≥
e. ≤

ANSWER: b

113. Rationalize the denominator of the following expression and then simplify your answer.

$\frac{1}{\sqrt{3}}$

a. 3

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

b. $\sqrt{3}$

c. $\frac{1}{3}$

d. $\frac{1}{9}$

e. $\frac{\sqrt{3}}{3}$

ANSWER: e

114. Rationalize the denominator of the following expression and then simplify your answer.

$$\frac{7}{\sqrt{54}-5}$$

a. $\frac{7\left(\sqrt{54}+5\right)}{29}$

b. $\frac{7\left(\sqrt{54}-5\right)}{29}$

c. $\left(\sqrt{54}+5\right)$

d. $\frac{7}{5}\left(\sqrt{54}+5\right)$

e. $\frac{7}{29}$

ANSWER: a

115. Rationalize the numerator of the following expression and then simplify your answer.

$$\frac{\sqrt{8}}{2}$$

a. $\sqrt{2}$

b. 2

c. 8

d. $\frac{1}{2}$

e. $\frac{1}{8}$

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

116. Fill in the missing form of the expression.

Radical Form	*Rational Exponent Form*
$\sqrt{4.5}$	-------

a. $\frac{1}{4.5}$

b. 4.5

c. $(4.5)^2$

d. $(4.5)^{\frac{1}{2}}$

e. $\frac{1}{(4.5)^{\frac{1}{2}}}$

ANSWER: d

117. Fill in the missing form of the expression.

Radical Form	*Rational Exponent Form*
------	$84^{1/4}$

a. $\frac{1}{(84)^{\frac{1}{4}}}$

b. 84

c. $(84)^{\frac{1}{2}}$

d. $\sqrt[4]{84}$

e. $\frac{1}{84}$

ANSWER: d

118. Reduce the index of radical.

$\sqrt[8]{(x+1)^{10}}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

a. $(x+1)^{10}$

b. $\sqrt[4]{(x-1)^5}$

c. $\sqrt[4]{(x+1)^5}$

d. $(x+1)$

e. $\sqrt[18]{(x+1)}$

ANSWER: c

119. The period T (in seconds) of a pendulum is $T=2\pi\sqrt{L/32}$, where L is the length of the pendulum (in feet). Find the period of a pendulum whose length is 8 feet.

a. 1.008 sec
b. 3.142 sec
c. 5.142 sec
d. 4.142sec
e. 3.642 sec

ANSWER: b

120. A stream of water moving at the rate of v feet per second can carry particles of size $0.03\sqrt{v}$ inches. Find the size of the largest particle that can be carried by a stream flowing at the rate of $\frac{3}{4}$ foot per second. (Round your answer to three decimal places.)

a. 0.046
b. 0.066
c. 0.026
d. 0.036
e. 0.056

ANSWER: c

121. Evaluate the expression.

$$\frac{4^{-7}}{4^{-8}}$$

a. $\frac{-7}{-8}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

b. $-\frac{1}{4}$

c. $\frac{1}{4}$

d. 4

e. –4

ANSWER: d

122. Evaluate the expression.

$4^{-3}+3^{-1}$

a. $\frac{2}{67}$

b. $\frac{67}{192}$

c. $-\frac{2}{67}$

d. $-\frac{67}{192}$

e. –15

ANSWER: b

123. Evaluate the expression.

$(2^{-2})^3$

a. 2

b. –12

c. –64

d. $-\frac{1}{64}$

e. $\frac{1}{64}$

ANSWER: e

124. Evaluate the expression for the given value of x.

$8x^{-1} \quad x=-5$

a. $-\frac{8}{5}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

b. $\frac{8}{5}$

c. $\frac{1}{40}$

d. –40

e. 40

ANSWER: a

125. Evaluate the expression for the given value of x.

$-9x^0 \quad x = -4$

a. 0

b. –9

c. 9

d. –36

e. 36

ANSWER: b

126. Evaluate the expression for the given value of x.

$3x^4 \quad x = 3$

a. 36

b. $-\frac{1}{243}$

c. $\frac{1}{243}$

d. 243

e. –243

ANSWER: d

127. Simplify the expression.

$-2x^7(3x^5)^3$

a. $-18x^{15}$

b. $-54x^{15}$

c. $-54x^{22}$

d. $-6x^{15}$

e. $-18x^{22}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

ANSWER: c

128. Simplify the expression.

$\left(\frac{4}{z}\right)^2\left(\frac{2}{z}\right)^3$

a. $\frac{48}{z^5}$

b. $\frac{128}{z^5}$

c. $\frac{128}{z^6}$

d. $\frac{48}{z^6}$

e. $\frac{24}{z^6}$

ANSWER: b

129. Write the number in scientific notation.

One pint is about 473.180000 cubic centimeters.

a. 0.47318×10^3

b. 47.318×10^1

c. 4.7318×10^2

d. 4.7318×10^1

e. 473.180000×10^2

ANSWER: c

130. Write the number in decimal notation.

One knot equals approximately 1.012686×10^2 feet per minute.

a. 101.2686

b. 10126.86

c. 1012.686

d. –101.2686

e. 1.012686

ANSWER: a

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Name:_____ Class:_____ Date:_____

Section P.1 Review of Real Numbers and Their Properties

131. Use a calculator to evaluate the expression. (Round your answer to three decimal places.)

$$\frac{25{,}000{,}000 + 29{,}000{,}000}{0.072}$$

a. 4.031×10^{8}

b. 4.031×10^{9}

c. 7.500×10^{7}

d. 7.500×10^{9}

e. 7.500×10^{8}

ANSWER: e

132. Use a calculator to evaluate the expression. (Round your answer to three decimal places.)

$$(3.57 \times 10^{-4})^{1/2}$$

a. 1.785×10^{-4}

b. 1.889×10^{-2}

c. 3.570×10^{-2}

d. 1.889×10^{0}

e. 1.785×10^{0}

ANSWER: b

133. Evaluate the expression without using a calculator.

$$9^{(-1/2)}$$

a. –3

b. 9

c. –9

d. $\frac{1}{3}$

e. $-\frac{1}{3}$

ANSWER: d

134. Evaluate the expression without using a calculator.

$$-\left(\frac{1}{27}\right)^{-7/3}$$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

a. $\frac{1}{2187}$

b. $-\frac{7}{81}$

c. $\frac{7}{81}$

d. 2187

e. –2187

ANSWER: e

135. Use a calculator to approximate the number. (Round your answer to three decimal places.)

$\sqrt[5]{256}$

a. 3.031

b. 1280.000

c. 16.000

d. 51.200

e. 261.000

ANSWER: a

136. Use a calculator to approximate the number. (Round your answer to three decimal places.)

$\left(\frac{12}{5}\right)^{-3/8} - \left(-\frac{8}{5}\right)^{-7/5}$

a. –1.211

b. 5.378

c. –5.36

d. 1.238

e. 3.32

ANSWER: d

137. Simplify the radical expression.

$\sqrt[3]{40p^{11}v^{-9}}$

a. $\frac{2p\sqrt[3]{5p^8}}{v\sqrt{v^6}}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

b. $\frac{2p^3\sqrt[3]{5p^2}}{v^3}$

c. $\frac{2p\sqrt[3]{5p^2}}{v}$

d. $\frac{8p^9\sqrt[3]{5p^2}}{v^9}$

e. $\frac{8p\sqrt[3]{5p^8}}{v\sqrt{v^6}}$

ANSWER: b

138. Simplify the radical expression.

$\sqrt{245n^{13}} + 9\sqrt{5n^{13}}$

a. $315n^6\sqrt{n}$

b. $16n^6\sqrt{5n}$

c. $63n^6\sqrt{5n}$

d. $45n^{13}\sqrt{10}$

e. $14n^{13}\sqrt{101}$

ANSWER: b

139. Rationalize the denominator. Then simplify your answer.

$\frac{9}{\sqrt{22}}$

a. $\frac{81}{22}$

b. $\frac{9}{11}$

c. $\frac{9\sqrt{22}}{22}$

d. $\frac{3\sqrt{22}}{22}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

e. $\frac{3\sqrt{22}}{4}$

ANSWER: c

140. Rationalize the numerator. Then simplify your answer.

$$\frac{\sqrt{2}+7}{5}$$

a. $-\frac{5}{47}$

b. $-\frac{1}{9}$

c. $-\frac{1}{9\sqrt{2}-63}$

d. $-\frac{5}{47\sqrt{2}+329}$

e. $-\frac{47}{5\sqrt{2}-35}$

ANSWER: e

141. Perform the operations and simplify.

$$\frac{t^{5/6}m^{5/6}}{(tm)^{1/6}}$$

a. $t^{2/3}\,m^{2/3}$

b. $t^{5/6}\,m^{2/3}$

c. $t^{1/6}\,m^{2/3}$

d. $\frac{m^{2/3}}{t^{1/6}}$

e. $\frac{t^{1/6}}{m^{2/3}}$

ANSWER: a

142. Reduce the index of the radical.

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

$\sqrt[27]{z^{21}}$

a. z^6

b. $\frac{1}{z^6}$

c. $\sqrt[9]{z^7}$

d. $\sqrt[6]{z}$

e. $\sqrt{z^6}$

ANSWER: c

143. Write the expression as a single radical. Then simplify your answer.

$\sqrt{\sqrt[3]{10x^7r}}$

a. $\sqrt[9]{10x^7r}$

b. $x\sqrt[6]{10xr}$

c. $x\sqrt[4]{10x^3r}$

d. $x\sqrt[3]{10x^4r}$

e. $x\sqrt[5]{10x^2r}$

ANSWER: b

144. Rewrite the expression with positive exponents and simplify.

$\left(\frac{r^{-4}}{q^{-1}}\right)\left(\frac{r}{q}\right)^9$

a. $\frac{r^5}{q^8}$

b. $\frac{1}{q^8r^5}$

c. $\frac{q^9}{r^{36}}$

d. $\frac{r^{36}}{q^9}$

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

e. $\frac{q^8}{r^5}$

ANSWER: a

145. Rewrite the expression with positive exponents and simplify.

$(2z^2)^{-3}(4z^{-3})^{-1}$

a. $-\frac{1}{10z^3}$
b. $-\frac{10}{z^3}$
c. $\frac{24}{z^3}$
d. $\frac{1}{32z^3}$
e. $\frac{32}{z^3}$

ANSWER: d

146. Use a calculator to evaluate the expression. (Round your answer to three decimal places.)

$\frac{8{,}800{,}000 + 1{,}500{,}000}{0.0089}$

a. 1.686×10^8
b. 1.686×10^9
c. 1.157×10^8
d. 1.157×10^{10}
e. 1.157×10^9

ANSWER: e

147. Use a calculator to approximate the number. (Round your answer to three decimal places.)

$\sqrt[4]{8}$

a. 1.682
b. 32.000
c. 2.828
d. 2.000
e. 12.000

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

Section P.1 Review of Real Numbers and Their Properties

ANSWER: a

148. Use a calculator to approximate the number. (Round your answer to three decimal places.)

$\left(\frac{3}{5}\right)^{-6/5} - \left(\frac{3}{5}\right)^{-7/9}$

a. –0.398
b. 16.319
c. –12.032
d. 0.358
e. 2.582

ANSWER: d

149. Use a calculator to evaluate the expression. (If necessary, round your answer to three decimal places.)

$(-4)^3(4^2)$

a. –1,024
b. –256
c. 1,024
d. 256
e. 64

ANSWER: a

150. Use a calculator to evaluate the expression. (If necessary, round your answer to three decimal places.)

$\frac{2^3}{3^{-2}}$

a. 70
b. 71
c. 72
d. 74
e. 73

ANSWER: c

151. Use a calculator to evaluate the following expression. (Round your answer to three decimal places.)

$720\left(1 + \frac{0.16}{360}\right)^{500}$

a. 889.127
b. 919.127

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank

c. 899.127
d. 3.137×10^{10}
e. 909.127

ANSWER: c

152. Use a calculator to approximate the number. (Round your answer to three decimal places.)

$\sqrt[5]{(-67)^3}$

a. –12.464
b. 12.464
c. –6.856
d. 6.856
e. 2.319

ANSWER: a

153. Use a calculator to approximate the number. (Round your answer to three decimal places.)

$$\frac{7-(1.1)^{-3.2}}{6}$$

a. 7.000
b. 2.044
c. 0.044
d. 1.044
e. –1.044

ANSWER: d

154. Use a calculator to approximate the number. (Round your answer to three decimal places.)

$\sqrt[3]{5.3 \times 10^4}$

a. 38.563
b. 37.563
c. 32.563
d. 38,729.833
e. 42.563

ANSWER: b

Copyright Cengage Learning. Powered by Cognero.

Trigonometry 12th edition Larson Test Bank