Intermediate Algebra 14th edition Lial Test Bank

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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Decide if the statement is true or false.

1) 11 is a solution of - 5x = - 55.
   A) True
   B) False
   Answer: A

2) - 9 is a solution of - 9x = 82.
   A) True
   B) False
   Answer: B

3) 4 is a solution of 6x - 1 = 23.
   A) True
   B) False
   Answer: A

4) - 6 is a solution of - 2x + 3 = 19.
   A) True
   B) False
   Answer: B

5) - 3 is a solution of 3x + 6x = - 27.
   A) True
   B) False
   Answer: A

6) 7 is a solution of 9x - 2x = 74.
   A) True
   B) False
   Answer: B

7) - 2 is a solution of 7x + 5x = 11x.
   A) True
   B) False
   Answer: B

Decide whether the following is an expression or an equation.

8) - 7x - 4 - 4x - 6
   A) Expression
   B) Equation
   Answer: A

9) 6x - (5x - 1) = 2
   A) Equation
   B) Expression
   Answer: A

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10) $2(7x + 8) = 9(9x - 9)$

A) Equation

B) Expression

Answer: A

11) $3(8x + 3) - 2(4x - 7)$

A) Expression

B) Equation

Answer: A

12) $-8x + 3 - 3x + 8 = 0$

A) Expression

B) Equation

Answer: B

13) $3(2x - 5) = 5(x + 5)$

A) Equation

B) Expression

Answer: A

14) $-4(x - 9) - 3(x + 6) - 4x$

A) Expression

B) Equation

Answer: A

Solve the equation.

15) $8x + 8 = 12$

A) $\left\{\frac{5}{2}\right\}$

B) $\left\{-\frac{1}{2}\right\}$

C) $\left\{\frac{1}{2}\right\}$

D) $\left\{\frac{3}{8}\right\}$

Answer: C

16) $8s + 6 = 4s$

A) $\left\{-\frac{3}{2}\right\}$

B) $\left\{\frac{2}{3}\right\}$

C) $\left\{\frac{1}{2}\right\}$

D) $\left\{\frac{3}{2}\right\}$

Answer: A

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17) $21t - 26 = 9t - 2$

A) $\{-2\}$

B) $\{2\}$

C) $\left\{-\frac{3}{4}\right\}$

D) $\left\{-\frac{15}{11}\right\}$

Answer: B

18) $7(x + 3) = (7x + 21)$

A) $\emptyset$

B) {All real numbers}

C) {42}

D) {0}

Answer: B

19) $(y - 8) - (y + 5) = 9y$

A) $\left\{-\frac{13}{6}\right\}$

B) $\left\{-\frac{13}{8}\right\}$

C) $\left\{-\frac{13}{9}\right\}$

D) $\left\{-\frac{4}{9}\right\}$

Answer: C

20) $13(4c - 9) = 2c - 7$

A) $\left\{\frac{11}{54}\right\}$

B) $\left\{\frac{11}{5}\right\}$

C) $\left\{-\frac{11}{5}\right\}$

D) $\left\{\frac{124}{5}\right\}$

Answer: B

21) $5(y + 2) = 6(y - 7)$

A) {52}

B) {- 32}

C) {- 52}

D) {32}

Answer: A

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22) $5m + 8 + 4(4m - 4) = 4(m + 4)$

A) $\left\{\frac{24}{25}\right\}$

B) $\left\{\frac{24}{17}\right\}$

C) $\left\{\frac{40}{17}\right\}$

D) $\left\{\frac{8}{17}\right\}$

Answer: B

23) $-4x + 5(2x - 4) = -7 - 7x$

A) $\{27\}$

B) $\{1\}$

C) $\left\{-\frac{27}{13}\right\}$

D) $\{-1\}$

Answer: B

24) $-[5x + (9x + 2)] = 2 - (7x + 7)$

A) $\left\{\frac{7}{11}\right\}$

B) $\{-1\}$

C) $\left\{-\frac{3}{11}\right\}$

D) $\left\{\frac{3}{7}\right\}$

Answer: D

Decide whether the equation is conditional, an identity, or a contradiction. Give the solution set.

25) $20m + 12 = 4(3m - 15)$

A) Identity; {all real numbers}

B) Conditional; $\{-9\}$

C) Conditional; $\{6\}$

D) Contradiction; $\emptyset$

Answer: B

26) $2(24t + 12) = 6(4t - 16)$

A) Contradiction; $\emptyset$

B) Identity; {all real numbers}

C) Conditional; $\{-5\}$

D) Conditional; $\{3\}$

Answer: C

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27) $5(2f - 31) = 10f - 155$

A) Conditional; {0}
B) Contradiction; ∅
C) Identity; {all real numbers}
D) Identity; ∅

Answer: C

28) $5(5g + 1) - 25g - 5 = 0$

A) Conditional; {5}
B) Conditional; {0}
C) Contradiction; ∅
D) Identity; {all real numbers}

Answer: D

29) $25k + 58 = 5(5k + 11)$

A) Conditional; {5}
B) Contradiction; ∅
C) Identity; {all real numbers}
D) Conditional; {- 5}

Answer: B

30) $-25s - 106 + 5(5s + 22) = 0$

A) Identity; {all real numbers}
B) Conditional; {1}
C) Conditional; {5}
D) Contradiction; ∅

Answer: D

31) $5x + 9(x + 1) + 4 = 13 - 5x$

A) Conditional; {0}
B) Contradiction; ∅
C) Conditional; {1}
D) Identity; {all real numbers}

Answer: A

32) $2[3 - (5 - 5r)] - r = -10 + 3(2 + 3r)$

A) Contradiction; ∅
B) Conditional; {10}
C) Conditional; {- 5}
D) Identity; {all real numbers}

Answer: D

Solve the equation.

33) $\frac{f}{5} - 5 = 1$

A) {20}
B) {30}
C) {- 20}
D) {- 30}

Answer: B

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34) $\frac{2x}{5} - \frac{x}{3} = 4$

A) {120}
B) {- 120}
C) {60}
D) {- 60}

Answer: C

35) $\frac{p}{4} - \frac{3p}{8} = 4$

A) {- 28}
B) {32}
C) {28}
D) {- 32}

Answer: D

36) $\frac{r + 6}{3} = \frac{r + 8}{6}$

A) {- 4}
B) {4}
C) {3}
D) {- 12}

Answer: A

37) $\frac{a}{4} - \frac{1}{4} = - 3$

A) {13}
B) {11}
C) {- 13}
D) {- 11}

Answer: D

38) $\frac{y}{13} + 5 = 11$

A) {- 78}
B) {78}
C) {- 80}
D) {80}

Answer: B

39) $\frac{b}{15} - 7 = - 3$

A) {- 60}
B) {- 62}
C) {62}
D) {60}

Answer: D

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40) $\frac{7x+3}{2}+\frac{9}{2}=-\frac{5x}{7}$

A) $\left\{\frac{42}{59}\right\}$

B) $\left\{-\frac{28}{13}\right\}$

C) $\left\{-\frac{42}{59}\right\}$

D) $\left\{-\frac{84}{59}\right\}$

Answer: D

41) $-0.08x+0.14(x+500)=76$

A) {100}

B) {10}

C) {1,000}

D) {10,000}

Answer: A

42) $0.06y+0.15(300-y)=0.16y$

A) {180}

B) {112.5}

C) {11.25}

D) {360}

Answer: A

43) $-0.5(30{,}000)+0.15p=0.02(30{,}000+p)$

A) {120,000}

B) {1,200,000}

C) {2028}

D) {20,280}

Answer: A

Provide an appropriate response.

44) $2x-5=5+7x-3$

Is this a linear equation?

A) No

B) Yes

Answer: B

45) $-\frac{3}{x}=83$

Is this a linear equation?

A) No

B) Yes

Answer: A

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46) $5x^2 - 7 = 3x$

Is this a linear equation?

A) Yes

B) No

Answer: B

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

47) If one step in the solution of an equation is $-53 = -96$, what is the final solution of the equation?

Answer: The solution set is $\emptyset$.

48) True or false? This pair of equations is equivalent. $2x - 2 = 2$ and $2x + 8 = 12$

Answer: True. Each has the solution set {2}.

49) True or false? The solution set of the equation $7y - 6 = 7y + 3$ is {0}. Explain.

Answer: False. The equation is a contradiction, and thus the solution set is $\emptyset$.

50) True or false? The solution set of the equation $9(4s - 6) = 36s - 54$ is {1}. Explain.

Answer: False. The equation is an identity, and thus the solution set is {all real numbers}.

51) Find all values of s that make this statement true: $9(7s - 8) = 63s - 72$.

Answer: Since the equation is an identity, the solution set is {all real numbers}.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the equation for the specified variable. Use the distributive property to factor as necessary.

52) $4k + ar = r - 5y$ for r

A) $r = \frac{4k + 5y}{a - 1}$ or $r = \frac{-4k - 5y}{1 - a}$

B) $r = \frac{a - 1}{-4k - 5y}$ or $r = \frac{1 - a}{4k + 5y}$

C) $r = \frac{-4k - 5y}{a - 1}$ or $r = \frac{4k + 5y}{1 - a}$

D) $r = \frac{4k + a}{1 - 5y}$ or $r = \frac{-4k - a}{5y - 1}$

Answer: C

53) $-8s + 6p = tp - 6$ for p

A) $p = \frac{6 - t}{8s - 6}$ or $p = \frac{t - 6}{-8s + 6}$

B) $p = \frac{-8s + 6}{-t}$ or $p = \frac{8s - 6}{t}$

C) $p = \frac{-8s + 6}{6}$ or $p = \frac{8s - 6}{-6}$

D) $p = \frac{8s - 6}{6 - t}$ or $p = \frac{-8s + 6}{t - 6}$

Answer: D

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54) $w = \frac{3y - x}{y}$ for y

A) $y = \frac{-x}{w - 3}$ or $y = \frac{x}{3 - w}$

B) $y = \frac{3 - x}{w}$ or $y = \frac{x - 3}{-w}$

C) $y = \frac{w - 3}{-x}$ or $y = \frac{3 - w}{x}$

D) $y = \frac{x}{w - 3}$ or $y = \frac{-x}{3 - w}$

Answer: A

55) $c = \frac{5t + 4}{t}$ for t

A) $t = \frac{9}{c}$ or $t = \frac{-9}{-c}$

B) $t = \frac{c + 5}{4}$ or $t = \frac{-c - 5}{-4}$

C) $t = \frac{-4}{c - 5}$ or $t = \frac{4}{-c + 5}$

D) $t = \frac{4}{c - 5}$ or $t = \frac{-4}{-c + 5}$

Answer: D

Solve the equation for y.

56) $4x + 7y = 6$

A) $y = \frac{6 + 4x}{7}$

B) $y = \frac{-6 - 4x}{7}$

C) $y = -28x + 42$

D) $y = \frac{6 - 4x}{7}$

Answer: D

57) $-3x + 5y = 9$

A) $y = \frac{9 - 3x}{5}$

B) $y = \frac{-9 - 3x}{5}$

C) $y = 15x + 45$

D) $y = \frac{9 + 3x}{5}$

Answer: D

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58) $3x - 9y = 7$

A) $y = \frac{7 + 3x}{-9}$, or $y = \frac{3x + 7}{9}$

B) $y = \frac{-7 + 3x}{-9}$, or $y = \frac{-3x + 7}{9}$

C) $y = \frac{-7 - 3x}{-9}$, or $y = \frac{3x + 7}{9}$

D) $y = \frac{7 - 3x}{-9}$, or $y = \frac{3x - 7}{9}$

Answer: D

59) $-5x - 8y = 3$

A) $y = \frac{3 + 5x}{-8}$, or $y = \frac{-5x - 3}{8}$

B) $y = \frac{-3 - 5x}{-8}$, or $y = \frac{5x + 3}{8}$

C) $y = \frac{-3 + 5x}{-8}$, or $y = \frac{3 - 5x}{8}$

D) $y = \frac{3 - 5x}{-8}$, or $y = \frac{5x - 3}{8}$

Answer: A

Solve the problem.

60) Find the corresponding Celsius temperature for a temperature of 305°F. Round to the nearest tenth, if necessary.

A) 491.4°C
B) 581°C
C) 165.9°C
D) 151.7°C

Answer: D

61) Find the corresponding Fahrenheit temperature for a temperature of 33°C. Round to the nearest tenth, if necessary.

A) 91.4°F
B) 117°F
C) 36.1°F
D) 0.6°F

Answer: A

62) What is the perimeter of a rectangle of length 10 ft and width 13 ft?

A) 46 ft
B) 33 ft
C) 23 ft
D) 92 ft

Answer: A

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63) What is the area of a square with side 1.9 cm?

A) 3.8 cm^2

B) 6 cm^2

C) 14.44 cm^2

D) 3.61 cm^2

Answer: D

64) Find the area of a triangle with height 12 m and base 5 m.

A) 30 m^2

B) 8.5 m^2

C) 60 m^2

D) 120 m^2

Answer: A

65) Find the surface area of a cylinder with a radius of 3 cm and a height of 40 cm. Use 3.14 for π.

A) 753.6 cm^2

B) 810.12 cm^2

C) 3,014.4 cm^2

D) 772.44 cm^2

Answer: B

66) Jay drove 284 km at an average rate of 71 km/hr. How long did the trip take?

A) $\frac{1}{4}$ hr

B) 4 hr

C) 3 hr

D) 5 hr

Answer: B

67) Janet drove 256 km, and the trip took 4 hr. At what average rate was Janet traveling?

A) 65 km/hr

B) 64 km/hr

C) 1,024 km/hr

D) $\frac{1}{64}$ km/hr

Answer: B

68) The area of a trapezoid is 54 square feet. If the bases are 7 ft and 11 ft, find the altitude of the trapezoid.

A) 12 ft

B) 6 ft

C) 1.5 ft

D) 3 ft

Answer: B

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69) A circle has a circumference of 36π m. Find the radius of the circle.
A) 6 m
B) 9 m
C) 36 m
D) 18 m

Answer: D

70) Find the simple interest if $4,800 is borrowed at 18.6% for 9 months (0.75 yr).
A) $193.55
B) $669.60
C) $66,960.00
D) $1,190.40

Answer: B

71) Find the simple interest if $1,100 is invested at 7% for 3.5 years.
A) $22.00
B) $77.00
C) $550.00
D) $269.50

Answer: D

72) Find the total amount in an account if $1,000 is invested at 17.8% simple interest for 4.5 years.
A) $1,801.00
B) $1,252.81
C) $801.00
D) $1,178.00

Answer: A

73) Find the total amount that must be repaid if $4,300 is borrowed at 19.8% simple interest for 3.5 years.
A) $7,279.90
B) $5,151.40
C) $5,060.10
D) $2,979.90

Answer: A

74) A chemical solution contains 2% salt. How much salt is in 1.5 ml of solution? Round your answer to three decimal places, if necessary.
A) 7.5 ml
B) 0.03 ml
C) 0.3 ml
D) 75 ml

Answer: B

75) During one year, the Larsons' real estate bill included $574 for local schools. Of this amount, $300 went to the high school district. What percent did the Larsons pay to the high school district? Round your answer to two decimal places.
A) 52.26%
B) 27.40%
C) 52.09%
D) 47.74%

Answer: A

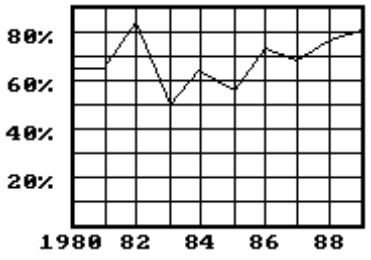
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76) A mixture of chlorine and water contains a total of 74 gallons of liquid. There are 63 gallons of pure chlorine in the mixture. (i) What percent of the mixture is water? (ii) What percent of the mixture is chlorine? Round your answer to the nearest percent, if necessary.

A) (i) 15% water; (ii) 85% chlorine
B) (i) 63% water; (ii) 37% chlorine
C) (i) 27% water; (ii) 73% chlorine
D) (i) 85% water; (ii) 15% chlorine

Answer: A

77) The graph shows the percent of students at a local high school who were enrolled in a foreign language class each school year during the 1980s.

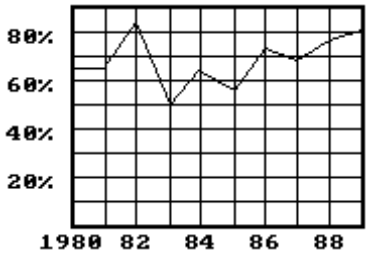


What is the best estimate for the number of students taking a language in 1986 if a total of 3,960 students were enrolled in the school?

A) 2,891 students
B) 1,069 students
C) 2,841 students
D) 51 students

Answer: A

78) The graph shows the percent of students at a local high school who were enrolled in a foreign language class each school year during the 1980s.



What is the best estimate for the number of students not taking a language in 1982 if a total of 2,380 students were enrolled in the school?

A) 405 students
B) 1,975 students
C) 4,284 students
D) 455 students

Answer: A

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79) When a loan scheduled to run n payments is paid off k payments ahead of schedule, the amount of unearned interest u is given by $u = f \cdot \frac{k(k+1)}{n(n+1)}$, where f is the total scheduled finance charge. The finance charge on a loan taken out by Ajay is $544. If there were 48 equal monthly installments needed to repay the loan, and the loan is paid in full with 4 months remaining, find the amount of unearned interest. (Round your answer to the nearest cent.)

A) $2.89
B) $456.23
C) $4.63
D) $457.96

Answer: C

80) When a loan scheduled to run n payments is paid off k payments ahead of schedule, the amount of unearned interest u is given by $u = f \cdot \frac{k(k+1)}{n(n+1)}$, where f is the total scheduled finance charge. The finance charge on a loan taken out by Ximena is $618. If there were 36 equal monthly installments needed to repay the loan, and the loan is paid in full with 6 months remaining, find the total finance charge paid. (Round your answer to the nearest cent.)

A) $19.49
B) $598.51
C) $618.00
D) $431.49

Answer: B

81) The formula $A = \frac{2400f}{b(p+1)}$ gives the approximate annual interest rate for a consumer loan paid off with monthly payments, where f is the finance charge on the loan, p is the number of payments, and b is the original amount of the loan. Find the approximate annual interest rate for an automobile loan to be repaid in 18 monthly installments if the finance charge on the loan is $320 and the original loan balance is $3,690. (Round your answer to two decimal places, if necessary.)

A) 9.66%
B) 10.95%
C) 12.24%
D) 11.56%

Answer: B

82) Students at East Central High School earned $356 selling candy. They want to make $4,910 for a club trip. What percent of their goal has been reached? Round to the nearest tenth of a percent, if necessary.

A) 0.7%
B) 7.3%
C) 13.8%
D) 138%

Answer: B

83) Allied Plumbing spent $39,000 this year on advertising alone. If total sales were $350,200, what percent of total sales was spent on advertising? Round to the nearest tenth of a percent, if necessary.

A) 1.1%
B) 9%
C) 90%
D) 11.1%

Answer: D

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84) A printer priced at $602 is sold for $338. What was the percent of price reduction? Round to the nearest tenth of a percent, if necessary.

A) 43.9%
B) 178.1%
C) 56.1%
D) 228%

Answer: A

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

85) Suppose the formula $A = 2\pi rh + 2\pi r^2$ is solved for r with the following result: $r = \frac{A}{2\pi h + 2\pi r}$. Is this an acceptable solution? Explain.

Answer: No. The variable r should not appear on both sides of the equation in the solution.

86) Suppose the formula $s = \frac{1}{2}gt^2 + v_o t$ is solved for t with the following result: $t = \frac{2s}{gt + 2v_o}$. Is this an acceptable solution? Explain.

Answer: No. The variable t should not appear on both sides of the equation in the solution.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

87) Which of the following is not a correct answer when the formula $A = \frac{1}{2}h(b + B)$ is solved for b?

A) $\frac{2A}{h} - B$

B) $\frac{2A - B}{h}$

C) $\frac{A - \frac{1}{2}Bh}{\frac{1}{2}h}$

D) $\frac{2A - Bh}{h}$

Answer: B

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88) Which of the following is not a correct answer when the formula $V = \frac{1}{3}\pi r^2 h$ is solved for h?

A) $\frac{V}{\frac{1}{3}\pi r^2}$

B) $3\left(\frac{V}{\pi r^2}\right)$

C) $\frac{3V}{\pi r^2}$

D) $\frac{1}{3}\left(\frac{V}{\pi r^2}\right)$

Answer: D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

89) The volume of a rectangular solid is to be 72 cubic units. Give two sets of possible dimensions for the solid.

Answer: Answers will vary, but the product of the three dimensions must be 72.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

90) In order to purchase framing for a picture, would you need to use perimeter or area to decide how much to buy?

A) Area

B) Perimeter

Answer: B

91) In order to purchase carpet for a room, would you need to use perimeter or area to decide how much to buy?

A) Perimeter

B) Area

Answer: B

Translate the verbal phrase into a mathematical expression. Use x to represent the unknown number.

92) 101 more than a number

A) 101 + x

B) 101 - x

C) 101x

D) 101

Answer: A

93) 44 greater than a number

A) x + 44

B) 44x

C) 44

D) x - 44

Answer: A

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94) 119 less than a number

A) 119x

B) x + 119

C) x - 119

D) 119 - x

Answer: C

95) 4 times a number

A) 4 + x

B) $\frac{4}{x}$

C) 4x

D) 4 - x

Answer: C

96) A number divided by 23

A) 23 + x

B) $\frac{x}{23}$

C) 23 - x

D) 23x

Answer: B

97) 187 divided by some number

A) 187x

B) 187 + x

C) 187 - x

D) $\frac{187}{x}$

Answer: D

98) Four times a number added to 9

A) 4x - 9

B) 4(x + 9)

C) 4x(9 + x)

D) 4x + 9

Answer: D

99) The product of 6 and 3 less than a number

A) 6x - 3

B) 6(x + 3)

C) 6(3 - x)

D) 6(x - 3)

Answer: D

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100) The product of 4 more than a number and 4 less than the number

A) $x + 4(x - 4)$

B) $(x + 4) - 4$

C) $(x + 4)(4 - x)$

D) $(x + 4)(x - 4)$

Answer: D

101) The quotient of 33 and ten times a nonzero number

A) $\frac{33}{10x}$ $(x \neq 0)$

B) $\frac{33}{10 + x}$ $(x \neq 0)$

C) $\frac{10}{33x}$ $(x \neq 0)$

D) $\frac{33}{10x}$ $(x = 0)$

Answer: A

Use the variable x for the unknown, and write an equation representing the verbal sentence. Then solve the problem.

102) Four times a number added to 7 times the number equals 33.

A) $7x + 4x = 33; 3$

B) $4x(7 + x) = 33; -3$

C) $4(x + 7) = 33x; -3$

D) $7x - 4x = 33; 3$

Answer: A

103) When 4 times a number is subtracted from 7 times the number, the result is 21.

A) $4x(7 - x) = 21; -7$

B) $4x + 7x = 21; 3$

C) $4(x - 7) = 21x; 3$

D) $7x - 4x = 21; 7$

Answer: D

104) If 5 times a number is added to - 6, the result is equal to 11 times the number.

A) $11(5x - 6) = -6; -1$

B) $5x + 6x = 11; 1$

C) $5x - (-6) = 11x; 1$

D) $5x + (-6) = 11x; -1$

Answer: D

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105) When $\frac{1}{4}$ of a number is added to 24, the result is 37.

A) $24 + \frac{1}{4}x = 37; 52$

B) $37 + \frac{1}{4}x = 24; 52$

C) $\frac{1}{4}x - 24 = 37; 244$

D) $\frac{1}{4} + x = 37; 37$

Answer: A

106) When 50% of a number is subtracted from 70, the result is 2 less than the number.

A) $70 - 50 = x - 2; 22$

B) $70 - 0.5x = x - 2; 48$

C) $70 + 0.5x = x - 2; 144$

D) $0.5x - 70 = x - 2; -136$

Answer: B

Decide whether the following is an expression or an equation. Simplify any expression or solve any equation.

107) $4x - (3x - 1) = 2$

A) Expression; $2x + 3$

B) Equation; $\left\{\frac{1}{7}\right\}$

C) Equation; $\{1\}$

D) Expression; $3x + 2$

Answer: C

108) $5(2x - 3) = 9(x + 4)$

A) Equation; $\{-21\}$

B) Expression; $9x + 5$

C) Expression; $9x - 5$

D) Equation; $\{51\}$

Answer: D

109) $-7(9x + 5) + 3(9x + 5)$

A) Equation; $\{-36\}$

B) Expression; $2x - 2$

C) Equation; $\{-98\}$

D) Expression; $-36x - 20$

Answer: D

110) $5(x + 6) - 6(x - 5) = 0$

A) Expression; $5x + 6$

B) Equation; $\{0\}$

C) Expression; $5x - 5$

D) Equation; $\{60\}$

Answer: D

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111) $\frac{1}{2}x - \frac{5}{6}x + \frac{7}{12}x - 1$

A) Equation; $\left\{\frac{1}{12}\right\}$

B) Expression; $\frac{1}{4}x - 1$

C) Expression; $\frac{1}{3}x - 1$

D) Equation; $\left\{-\frac{11}{12}\right\}$

Answer: B

112) $-2(x+3)+5(x-4)=6$

A) Expression; $3x - 32$

B) Equation; $\left\{-\frac{32}{7}\right\}$

C) Expression; $3x + 20$

D) Equation; $\left\{\frac{32}{3}\right\}$

Answer: D

113) $\frac{1}{5}x + \frac{1}{7}x - \frac{1}{3} + 5$

A) Expression; $-\frac{2}{35}x + \frac{16}{3}$

B) Equation; $\left\{-\frac{49}{6}\right\}$

C) Expression; $\frac{12}{35}x + \frac{14}{3}$

D) Equation; $\left\{\frac{28}{3}\right\}$

Answer: C

Solve the problem.

114) Find the length of a rectangular lot with a perimeter of 130 m if the length is 5 m more than the width.

A) 35 m

B) 30 m

C) 65 m

D) 70 m

Answer: A

115) A square plywood platform has a perimeter which is 9 times the length of a side, decreased by 35. Find the length of a side.

A) 7

B) 1

C) 12

D) 5

Answer: A

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116) A rectangular Persian carpet has a perimeter of 176 inches. The length of the carpet is 26 in. more than the width. What are the dimensions of the carpet?
A) Width: 75 in.; length: 101 in.
B) Width: 31 in.; length: 57 in.
C) Width: 62 in.; length: 88 in.
D) Width: 57 in.; length: 83 in.

Answer: B

117) A pie- shaped (triangular) lake- front lot has a perimeter of 2,000 ft. One side is 100 ft longer than the shortest side, while the third side is 400 ft longer than the shortest side. Find the lengths of all three sides.
A) 500 ft, 600 ft, 900 ft
B) 600 ft, 600 ft, 600 ft
C) 100 ft, 200 ft, 300 ft
D) 600 ft, 700 ft, 1,000 ft

Answer: A

118) Gloria collected 32 fantail and comet goldfish. There were 8 fewer fantails than comets. How many comets did Gloria have?
A) 20 comets
B) 24 comets
C) 14 comets
D) 12 comets

Answer: A

119) The two largest oil spills together released 279 million gallons of oil into the oceans. The smaller of the two released 55 million gallons less than the larger of the two. How many million gallons of oil did the larger one release?
A) 167 million gallons
B) 224 million gallons
C) 112 million gallons
D) 111 million gallons

Answer: A

120) A biologist collected 335 fern and moss samples. There were 47 fewer ferns than moss samples. How many fern samples did the biologist collect?
A) 191 fern samples
B) 144 fern samples
C) 288 fern samples
D) 119 fern samples

Answer: B

121) In a recent school board election, the two candidates for president received 1,054 votes. The loser received 414 fewer votes than the winner. How many votes did the winner receive?
A) 734 votes
B) 574 votes
C) 640 votes
D) 320 votes

Answer: A

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Solve the percent problem.

122) If Gloria received a 6 percent raise and is now making $23,320 a year, what was her salary before the raise?
A) $21,320
B) $23,000
C) $22,000
D) $22,320

Answer: C

123) Stevie bought a stereo for $275 and put it on sale at his store at a 70% markup rate. What was the retail price of the stereo?
A) $375.00
B) $367.50
C) $467.50
D) $550.00

Answer: C

124) An investor bought 100 shares of stock. The value of the shares went up 7% and then he sold them. How much did the investor pay for the 100 shares if he sold them for $1,391?
A) $1,488
B) $1,350
C) $1,300
D) $1,341

Answer: C

125) At the end of the day, a storekeeper had $1,352 in the cash register, counting both the sale of goods and the sales tax of 4%. Find the amount that is the tax.
A) $57
B) $42
C) $47
D) $52

Answer: D

126) After receiving a discount of 14.5% on its bulk order of typewriter ribbons, John's Office Supply pays $3,933. What was the price of the order before the discount?
A) $4,600
B) $3,559
C) $4,503
D) $3,363

Answer: A

127) After spending $3,150 for tables and $1,750 for chairs, a convention center manager finds that 15% of his original budget remains. Find the amount that remains. Round your answer to the nearest dollar, if necessary.
A) $5,765
B) $2,059
C) $865
D) $735

Answer: C

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128) Midtown Antiques collects 6% sales tax on all sales. If total sales including tax are $1,918.67, find the portion that is the tax. Round your answer to the nearest cent.

A) $108.60
B) $115.12
C) $1,810.07
D) $98.60

Answer: A

Solve the investment problem.

129) Mardi received an inheritance of $70,000. She invested part at 12% and deposited the remainder in tax- free bonds at 9%. Her total annual income from the investments was $7,500. Find the amount invested at 12%.

A) $62,500
B) $40,000
C) $39,000
D) $20,000

Answer: B

130) Walt made an extra $7,000 last year from a part- time job. He invested part of the money at 7% and the rest at 10%. He made a total of $580 in interest. How much was invested at 10%?

A) $5,000
B) $4,000
C) $3,000
D) $3,500

Answer: C

131) Roberto invested some money at 6%, and then invested $3,000 more than twice this amount at 10%. His total annual income from the two investments was $4,200. How much was invested at 10%?

A) $33,000
B) $3,300
C) $30,000
D) $9,000

Answer: A

Solve the mixture problem.

132) It is necessary to have a 40% antifreeze solution in the radiator of a certain car. The radiator now has 30 liters of 20% solution. How many liters of this should be drained and replaced with 100% antifreeze to get the desired strength?

A) 10.0 liters
B) 15 liters
C) 12 liters
D) 7.5 liters

Answer: D

133) How many liters of a 10% alcohol solution must be mixed with 70 liters of a 80% solution to get a 60% solution?

A) 28 liters
B) 98 liters
C) 2.8 liters
D) 9.8 liters

Answer: A

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134) In a chemistry class, 8 liters of a 4% silver iodide solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed?

A) 8 liters
B) 5 liters
C) 4 liters
D) 3 liters

Answer: C

135) A merchant has coffee worth $3 a pound that she wishes to mix with 90 pounds of coffee worth $8 a pound to get a mixture worth $4 a pound. How many pounds of the $3 coffee should be used?

A) 360 lb
B) 450 lb
C) 180 lb
D) 225 lb

Answer: A

Solve the problem.

136) Jay drove 320 kilometers at the average rate of 64 kilometers per hour. How long did the trip take?

A) 6 hours
B) 3 hours
C) 5 hours
D) 4 hours

Answer: C

137) Janet drove 385 kilometers and the trip took 5 hours. How fast was Janet traveling?

A) 97 kilometers per hour
B) 67 kilometers per hour
C) 77 kilometers per hour
D) 87 kilometers per hour

Answer: C

138) What amount of money is found in a coin purse containing 19 dimes and 10 quarters?

A) $5.75
B) $4.40
C) $0.29
D) $440.00

Answer: B

139) An equilateral triangle has perimeter 66 inches. What would be the perimeter of a square whose sides each measure the same length as the side of the triangle?

A) 44 inches
B) 484 inches
C) 22 inches
D) 88 inches

Answer: D

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140) A convention manager finds that she has $1,360, made up of twenties and fifties. She has a total of 50 bills. How many fifty- dollar bills does the manager have?

A) 12
B) 8
C) 38
D) 50

Answer: A

141) A woman has $1.70 in dimes and nickels. She has 5 more dimes than nickels. How many nickels does she have?

A) 3
B) 13
C) 8
D) 18

Answer: C

142) A bank teller has some five- dollar bills and some twenty- dollar bills. The teller has 5 more of the twenties. The total value of the money is $725. Find the number of five- dollar bills that the teller has.

A) 20
B) 25
C) 35
D) 30

Answer: B

143) A cashier has a total of 127 bills, made up of fives and tens. The total value of the money is $645. How many ten- dollar bills does the cashier have?

A) 3
B) 2
C) 1
D) 125

Answer: B

144) There were 370 people at a play. The admission price was $2.00 for adults and $1.00 for children. The admission receipts were $590. How many adults and children attended?

A) 75 adults and 295 children
B) 147 adults and 223 children
C) 150 adults and 220 children
D) 220 adults and 150 children

Answer: D

145) There were 33,000 people at a ball game in Los Angeles. The day's receipts were $192,000. How many people paid $14.00 for reserved seats and how many paid $4.00 for general admission?

A) 15,000 paid $14 and 18,000 paid $4
B) 6,000 paid $14 and 27,000 paid $4
C) 18,000 paid $14 and 15,000 paid $4
D) 27,000 paid $14 and 6,000 paid $4

Answer: B

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146) Jill is 22.5 kilometers away from Joe. Both begin to walk toward each other at the same time. Jill walks at 2 kilometers per hour. They meet in 5 hours. How fast is Joe walking?

A) 4.5 kilometers per hour
B) 2 kilometers per hour
C) 3.5 kilometers per hour
D) 2.5 kilometers per hour

Answer: D

147) Bert is 30 kilometers away from Brenda. Both begin to walk toward each other at the same time. Bert walks at 4.5 kilometers per hour. They meet in 5 hours. How fast is Brenda walking?

A) 3.5 kilometers per hour
B) 2.5 kilometers per hour
C) 1.5 kilometers per hour
D) 4.5 kilometers per hour

Answer: C

148) Candy and Delvis are riding bicycles in the same direction. Candy is traveling at a speed of 4 miles per hour, and Delvis is traveling at a speed of 10 miles per hour. In 5 hours what is the distance between them (assuming that they began at the same point and time)?

A) 30 miles
B) 39 miles
C) 27 miles
D) 31 miles

Answer: A

149) From a point on a river, two boats are driven in opposite directions, one at 6 miles per hour and the other at 8 miles per hour. In how many hours will they be 56 miles apart?

A) 1 hour
B) 5 hours
C) 4 hours
D) 6 hours

Answer: C

150) The speed of a stream is 5 mph. If a boat travels 66 miles downstream in the same time that it takes to travel 33 miles upstream, what is the speed of the boat in still water?

A) 15 mph
B) 18 mph
C) 17 mph
D) 10 mph

Answer: A

151) A plane flies 480 miles with the wind and 340 miles against the wind in the same length of time. If the speed of the wind is 21 mph, what is the speed of the plane in still air?

A) 148 mph
B) 128 mph
C) 113 mph
D) 123 mph

Answer: D

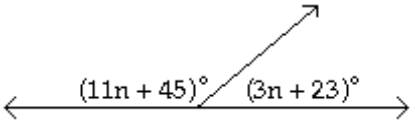
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152) Tom Quig traveled 220 miles east of St. Louis. For most of the trip he averaged 60 mph, but for one period of time he was slowed to 10 mph due to a major accident. If the total time of travel was 7 hours, how many miles did he drive at the reduced speed?

A) 50 miles
B) 60 miles
C) 35 miles
D) 40 miles

Answer: D

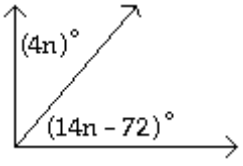
153) Find the measures of the supplementary angles.



A) 43°, 47°
B) 137°, 43°
C) 47°, 43°
D) 133°, 47°

Answer: D

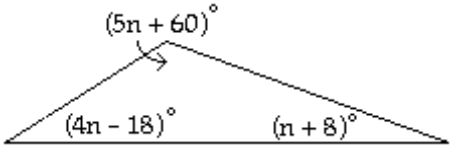
154) Find the measures of the complementary angles.



A) 43°, 47°
B) 36°, 144°
C) 36°, 54°
D) 39°, 51°

Answer: C

155) Find the measure of each angle in the triangle.

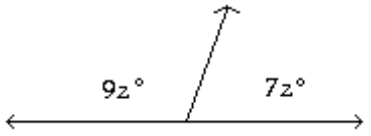


A) 34°, 125°, 21°
B) 32°, 37°, 21°
C) 28°, 128°, 24°
D) 38°, 123°, 19°

Answer: A

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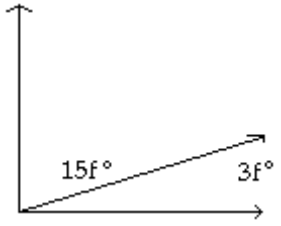
156) Find the measures of the supplementary angles.



A) 98.25°, 81.75°
B) 101.25°, 78.75°
C) 96.25°, 83.75°
D) 90°, 70°

Answer: B

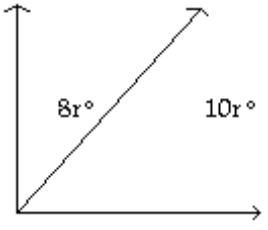
157) Find the measures of the complementary angles.



A) 70°, 20°
B) 37.5°, 7.5°
C) 150°, 30°
D) 75°, 15°

Answer: D

158) Find the measures of the complementary angles.

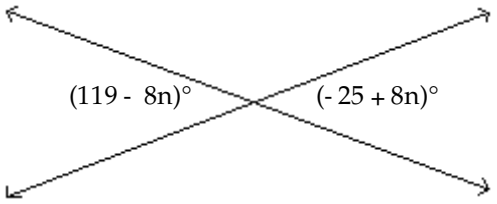


A) 40°, 50°
B) 80°, 100°
C) 42°, 48°
D) 45°, 45°

Answer: A

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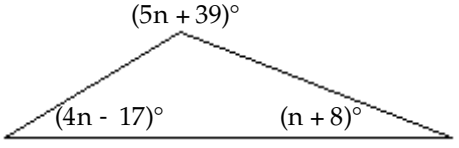
159) Find the measures of the vertical angles.



A) 9°, 9°
B) 47°, 47°
C) 119°, 119°
D) - 25°, - 25°

Answer: B

160) Find the measure of each angle in the triangle.



A) 47°, 114°, 23°
B) 43°, 114°, 23°
C) 43°, 24°, 23°
D) 60°, 75°, 15°

Answer: B

Solve the problem involving consecutive integers.

161) The sum of three consecutive odd integers is 189. Find the integers.
A) 56, 57, 58
B) 63, 65, 67
C) 65, 67, 69
D) 61, 63, 65

Answer: D

162) The sum of two consecutive integers is - 373. Find the larger integer.
A) - 187
B) - 188
C) - 185
D) - 186

Answer: D

163) Two pages that face each other in a book have 457 as the sum of their page numbers. What is the number of the page that comes first?
A) 226
B) 227
C) 228
D) 229

Answer: C

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164) If three times the smaller of two consecutive integers is added to four times the larger, the result is 46. Find the smaller integer.

A) 7
B) 5
C) 18
D) 6

Answer: D

165) If the first and third of three consecutive odd integers are added, the result is 69 less than five times the second integer. Find the third integer.

A) 21
B) 23
C) 25
D) 46

Answer: C

166) The sum of the page numbers on the facing pages of a book is 339. Find the larger page number.

A) 168
B) 180
C) 165
D) 170

Answer: D

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

167) When solving a "word problem" we set up an equation in x. Give an example where the solution of the equation is not the answer to the problem.

Answer: Answers will vary. An example would be: One number is twice another and their sum is 60. Find the larger number. To solve this problem, the equation would be $x + 2x = 60$. $x = 20$. The problem asks for the larger number, which is $2x = 2(20) = 40$.

168) Two angles are complementary. One of the angles is r. How do you express the other angle?

Answer: 90 - r

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

169) Which two of the following equations do not correctly state the relationship between distance, rate and time?

(a) $\frac{d}{t} = r$ (b) $dr = t$

(c) $\frac{r}{t} = d$ (d) $\frac{d}{r} = t$

A) (b) & (c)
B) (a) & (d)
C) (a) & (c)
D) (b) & (d)

Answer: A

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SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

170) One student solved a problem involving money by using a denomination based on cents and not on dollars. For example, she multiplied the number of nickels by 5 cents and not by $0.05. Was she wrong?

Answer: Answers will vary. The student was not wrong. For example, if the problem asked to find the total amount, she may have intended to provide her final result in cents and not in dollars. Furthermore, if she had wanted to provide a final result in dollars, all she would need to do is divide the final result in cents by 100. As long as she was consistent in her use of denominations based on cents, her results would be valid.

171) If you are given the measure of one angle of a triangle, would you be able to provide the measures of the two other angles?

Answer: No. Not enough information is given.

172) Suppose you were to solve a problem involving motion, and the problem gave the rate in miles per hour and the time in minutes. Would you be able to determine the distance traveled? If so, how would you go about it?

Answer: Yes. You would need to convert the rate to miles per minute or the time to hours before proceeding to solve for the distance in miles.

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1) A
2) B
3) A
4) B
5) A
6) B
7) B
8) A
9) A
10) A
11) A
12) B
13) A
14) A
15) C
16) A
17) B
18) B
19) C
20) B
21) A
22) B
23) B
24) D
25) B
26) C
27) C
28) D
29) B
30) D
31) A
32) D
33) B
34) C
35) D
36) A
37) D
38) B
39) D
40) D
41) A
42) A
43) A
44) B
45) A
46) B
47) The solution set is ∅.
48) True. Each has the solution set {2}.
49) False. The equation is a contradiction, and thus the solution set is ∅.
50) False. The equation is an identity, and thus the solution set is {all real numbers}.

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51) Since the equation is an identity, the solution set is {all real numbers}.
52) C
53) D
54) A
55) D
56) D
57) D
58) D
59) A
60) D
61) A
62) A
63) D
64) A
65) B
66) B
67) B
68) B
69) D
70) B
71) D
72) A
73) A
74) B
75) A
76) A
77) A
78) A
79) C
80) B
81) B
82) B
83) D
84) A
85) No. The variable r should not appear on both sides of the equation in the solution.
86) No. The variable t should not appear on both sides of the equation in the solution.
87) B
88) D
89) Answers will vary, but the product of the three dimensions must be 72.
90) B
91) B
92) A
93) A
94) C
95) C
96) B
97) D
98) D
99) D
100) D

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101) A
102) A
103) D
104) D
105) A
106) B
107) C
108) D
109) D
110) D
111) B
112) D
113) C
114) A
115) A
116) B
117) A
118) A
119) A
120) B
121) A
122) C
123) C
124) C
125) D
126) A
127) C
128) A
129) B
130) C
131) A
132) D
133) A
134) C
135) A
136) C
137) C
138) B
139) D
140) A
141) C
142) B
143) B
144) D
145) B
146) D
147) C
148) A
149) C
150) A

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151) D
152) D
153) D
154) C
155) A
156) B
157) D
158) A
159) B
160) B
161) D
162) D
163) C
164) D
165) C
166) D
167) Answers will vary. An example would be: One number is twice another and their sum is 60. Find the larger number. To solve this problem, the equation would be $x + 2x = 60$. $x = 20$. The problem asks for the larger number, which is $2x = 2(20) = 40$.
168) $90 - r$
169) A
170) Answers will vary. The student was not wrong. For example, if the problem asked to find the total amount, she may have intended to provide her final result in cents and not in dollars. Furthermore, if she had wanted to provide a final result in dollars, all she would need to do is divide the final result in cents by 100. As long as she was consistent in her use of denominations based on cents, her results would be valid.
171) No. Not enough information is given.
172) Yes. You would need to convert the rate to miles per minute or the time to hours before proceeding to solve for the distance in miles.

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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

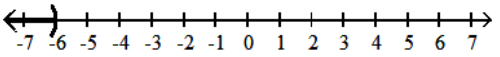
Write an inequality statement involving the letter x that describes the given graph or interval notation.

1) $(-3, \infty)$

A) $x > -3$
B) $x < -3$
C) $x \leq -3$
D) $x \geq -3$

Answer: A

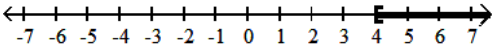
2)



A) $x \geq -6$
B) $x < -6$
C) $x > -6$
D) $x \leq -6$

Answer: B

3)



A) $x > 4$
B) $x \leq 4$
C) $x \geq 4$
D) $x < 4$

Answer: C

4) $(-\infty, -4)$

A) $x > -4$
B) $x \leq -4$
C) $x < -4$
D) $x \geq -4$

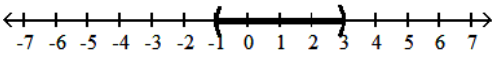
Answer: C

5) $(-2, 2)$

A) $-2 \leq x < 2$
B) $-2 \leq x \leq 2$
C) $-2 < x < 2$
D) $-2 < x \leq 2$

Answer: C

6)



A) $-1 \leq x < 3$
B) $-1 \leq x \leq 3$
C) $-1 < x \leq 3$
D) $-1 < x < 3$

Answer: D

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7) [- 4, 0)

A) $-4 \le x \le 0$

B) $-4 < x < 0$

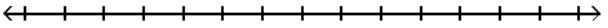
C) $-4 \le x < 0$

D) $-4 < x \le 0$

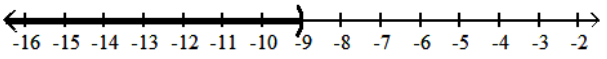
Answer: C

Solve the inequality. Give the solution set in both interval and graph forms.

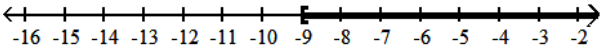
8) $x - 7 < -16$



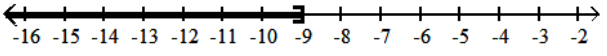
A) $(-\infty, -9)$



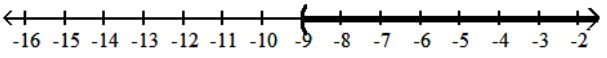
B) $[-9, \infty)$



C) $(-\infty, -9]$

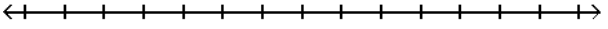


D) $(-9, \infty)$

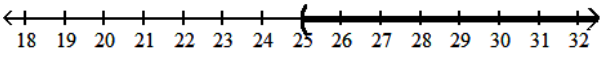


Answer: A

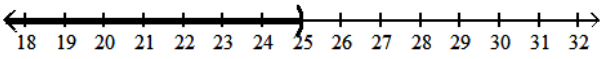
9) $-10y + 7 > -11y + 18$



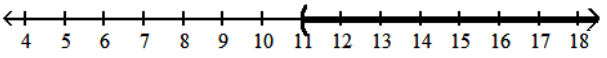
A) $(25, \infty)$



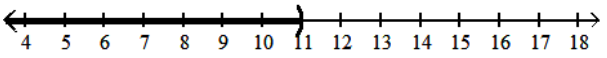
B) $(-\infty, 25)$



C) $(11, \infty)$



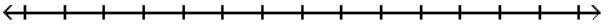
D) $(-\infty, 11)$



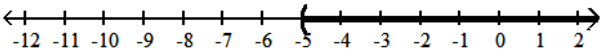
Answer: C

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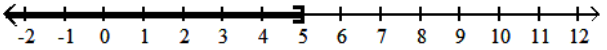
10) $-5z - 3 \leq -6z + 2$



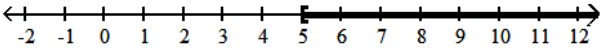
A) $(-5, \infty)$



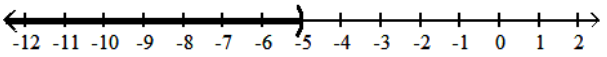
B) $(-\infty, 5]$



C) $[5, \infty)$

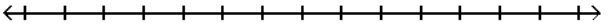


D) $(-\infty, -5)$

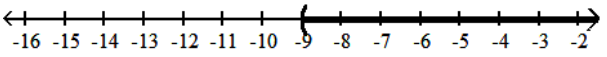


Answer: B

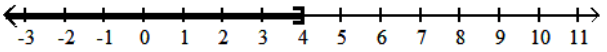
11) $-9z - 2 \geq -10z + 2$



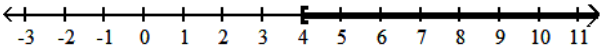
A) $(-9, \infty)$



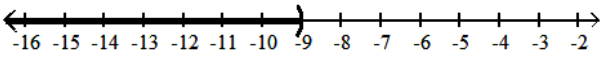
B) $(-\infty, 4]$



C) $[4, \infty)$



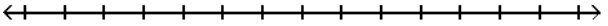
D) $(-\infty, -9)$



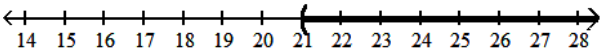
Answer: C

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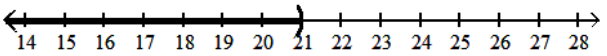
12) $21x + 27 > 3(6x + 4)$



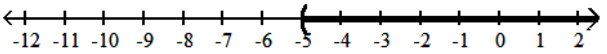
A) $(21, \infty)$



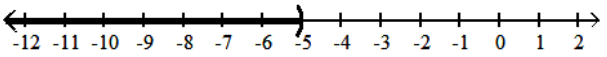
B) $(-\infty, 21)$



C) $(-5, \infty)$

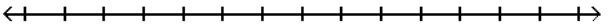


D) $(-\infty, -5)$

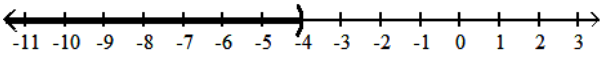


Answer: C

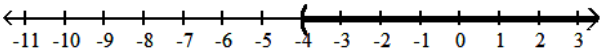
13) $-3(5y - 5) < -18y + 3$



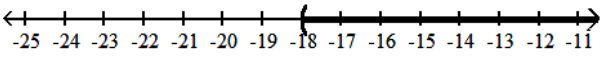
A) $(-\infty, -4)$



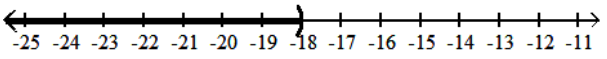
B) $(-4, \infty)$



C) $(-18, \infty)$



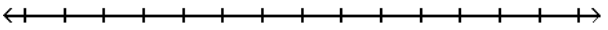
D) $(-\infty, -18)$



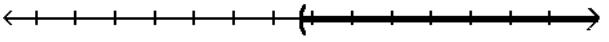
Answer: A

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14) $\frac{8x - 9}{4} < \frac{41}{8}$

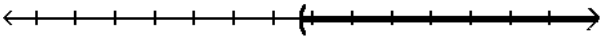


A) $\left(\frac{7.220445055e+14}{1.958086795e+14}, \infty\right)$



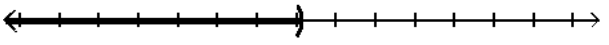
$\frac{7.220445055e+14}{1.958086795e+14}$

B) $\left(\frac{41}{8}, \infty\right)$



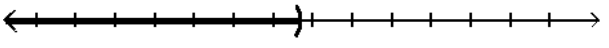
$\frac{41}{8}$

C) $\left(-\infty, \frac{41}{8}\right)$



$\frac{41}{8}$

D) $\left(-\infty, \frac{7.220445055e+14}{1.958086795e+14}\right)$

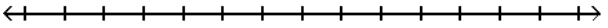


$\frac{7.220445055e+14}{1.958086795e+14}$

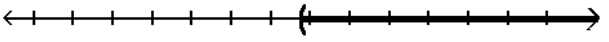
Answer: D

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15) $\frac{9x + 8}{-2} < -\frac{26}{9}$

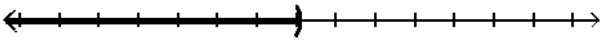


A) $\left(-\frac{9.147936743e+14}{2.849934139e+15}, \infty \right)$



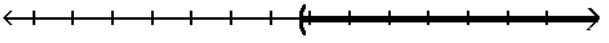
$-\frac{9.147936743e+14}{2.849934139e+15}$

B) $\left(-\infty, -\frac{26}{9} \right)$



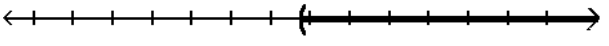
$-\frac{26}{9}$

C) $\left(-\frac{20}{9}, \infty \right)$



$-\frac{20}{9}$

D) $\left(-\frac{7.036874418e+14}{2.849934139e+15}, \infty \right)$

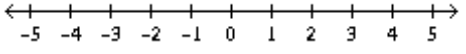


$-\frac{7.036874418e+14}{2.849934139e+15}$

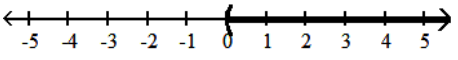
Answer: D

16) $15(4x - 7) > 6(10x - 14)$

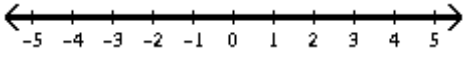
A) ∅



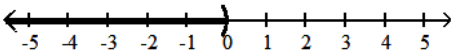
B) $(0, \infty)$



C) (∞, ∞)



D) $(-\infty, 0)$

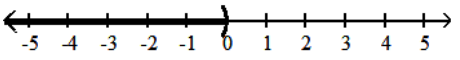


Answer: A

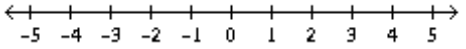
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17) $2x + 3(x - 6) < 5x - 3$

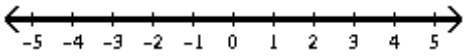
A) $(-\infty, 0)$



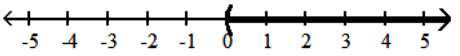
B) $\emptyset$



C) $(-\infty, \infty)$

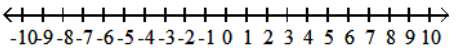


D) $(0, \infty)$

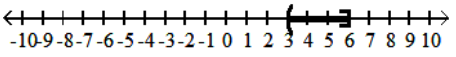


Answer: C

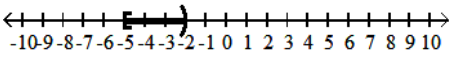
18) $-1 < x - 4 \leq 2$



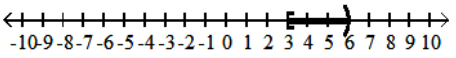
A) $(3, 6]$



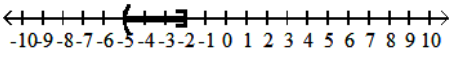
B) $[-5, -2)$



C) $[3, 6)$



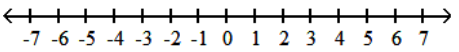
D) $(-5, -2]$



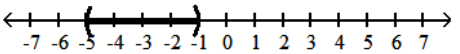
Answer: A

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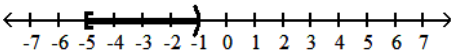
19) $-20 < 4b \leq -4$



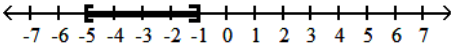
A) $(-5, -1)$



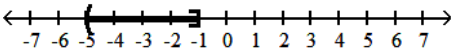
B) $[-5, -1)$



C) $[-5, -1]$

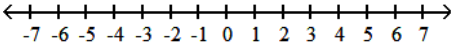


D) $(-5, -1]$

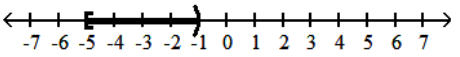


Answer: D

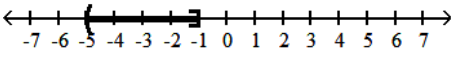
20) $-10 < -2b \leq -2$



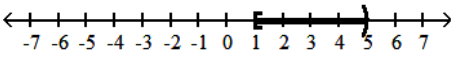
A) $[-5, -1)$



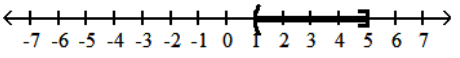
B) $(-5, -1]$



C) $[1, 5)$



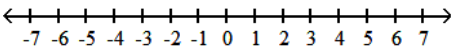
D) $(1, 5]$



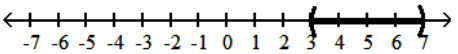
Answer: C

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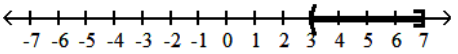
21) $8 < 2y + 2 \leq 16$



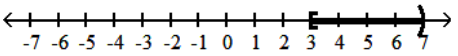
A) $(3, 7)$



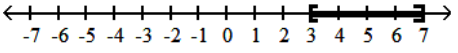
B) $(3, 7]$



C) $[3, 7)$

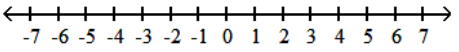


D) $[3, 7]$

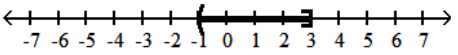


Answer: B

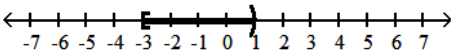
22) $0 < -2z + 2 \leq 8$



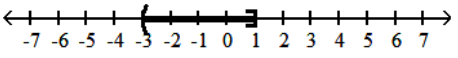
A) $(-1, 3]$



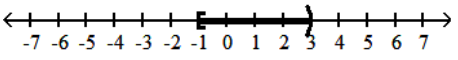
B) $[-3, 1)$



C) $(-3, 1]$



D) $[-1, 3)$



Answer: B

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23) $6 \le \frac{3x - 1}{2} \le 9$



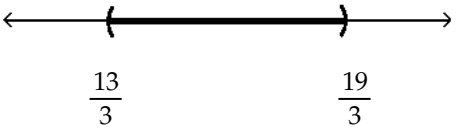
A) $\left[\frac{13}{3}, \frac{19}{3}\right]$



B) $\left[-\frac{13}{3}, \frac{19}{3}\right]$



C) $\left(\frac{13}{3}, \frac{19}{3}\right)$



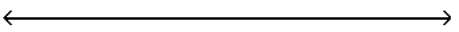
D) $\left[-\frac{19}{3}, \frac{13}{3}\right]$



Answer: A

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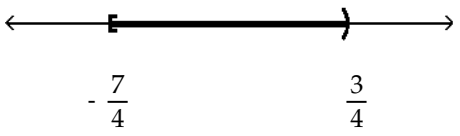
24) $4 < 1 - 4x \leq 8$



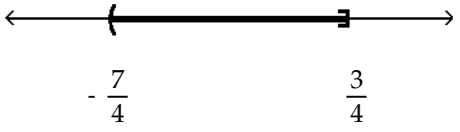
A) $\left[-\frac{7}{4}, -\frac{3}{4}\right)$



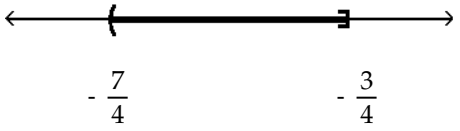
B) $\left[-\frac{7}{4}, \frac{3}{4}\right)$



C) $\left(-\frac{7}{4}, \frac{3}{4}\right]$



D) $\left(-\frac{7}{4}, -\frac{3}{4}\right]$



Answer: A

Solve the problem.

25) A salesperson has two job offers. Company A offers a weekly salary of $200 plus commission of 8% of sales. Company B offers a weekly salary of $400 plus commission of 4% of sales. What is the amount of sales above which Company A's offer is the better of the two?

A) $5,000
B) $10,000
C) $5,100
D) $2,500

Answer: A

26) Company A rents copiers for a monthly charge of $160 plus 8 cents per copy. Company B rents copiers for a monthly charge of $320 plus 4 cents per copy. What is the number of copies above which Company A's charges are the higher of the two?

A) 4,000 copies
B) 8,000 copies
C) 2,000 copies
D) 4,100 copies

Answer: A

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27) A car rental company has two rental rates. Rate 1 is $63 per day plus $.14 per mile. Rate 2 is $126 per day plus $.07 per mile. If you plan to rent for one day, how many miles would you need to drive to pay less by taking Rate 2?
A) more than 1,000 miles
B) more than 900 miles
C) more than 450 miles
D) more than 1,800 miles

Answer: B

28) Jim has gotten scores of 71 and 99 on his first two tests. What score must he get on his third test to keep an average of 90 or greater?
A) At least 85
B) At least 100
C) At least 86.7
D) At least 99

Answer: B

29) A bag of marbles has twice as many blue marbles as green marbles, and the bag has at least 60 marbles in it. At least how many green marbles does it have?
A) At least 40 green marbles
B) At least 21 green marbles
C) At least 30 green marbles
D) At least 20 green marbles

Answer: D

30) Jon has 837 points in his math class. He must have 85% of the 1,100 points possible by the end of the term to receive credit for the class. What is the minimum number of additional points he must earn by the end of the term to receive credit for the class?
A) 935 points
B) 263 points
C) 711 points
D) 98 points

Answer: D

31) Correct Computers, Inc. finds that the cost to make x laptop computers is C = 2,608x + 127,595, while the revenue produced from them is R = 3,235x (C and R are in dollars). What is the smallest whole number of computers, x, that must be sold for the company to show a profit?
A) 80,002,065
B) 22
C) 204
D) 745,537,585

Answer: C

32) Fantastic Flags, Inc. finds that the cost to make x flags is C = 29x + 14,632, while the revenue produced from them is R = 46x (C and R are in dollars). What is the smallest whole number of flags, x, that must be sold for the company to show a profit?
A) 861
B) 248,744
C) 196
D) 1,097,400

Answer: A

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33) Behemoth Back Packs, Inc. finds that the cost to make x back packs is C = 51x + 8,016, while the revenue produced from them is R = 122x (C and R are in dollars). What is the smallest whole number of back packs, x, that must be sold for the company to show a profit?

A) 569,136
B) 1,386,768
C) 113
D) 47

Answer: C

34) Pizzicato Pizza, Inc. finds that the cost to make x pizzas (with one topping) is C = 7x + 1,682, while the revenue produced from them is R = 12x (C and R are in dollars). What is the smallest whole number of pizzas, x, that must be sold for the company to show a profit?

A) 337
B) 31,958
C) 89
D) 8,410

Answer: A

35) Miraculous Music, Inc. finds that the cost to make x compact discs is C = 3x + 16,064, while the revenue produced from them is R = 17x (C and R are in dollars). What is the smallest whole number of compact discs, x, that must be sold for the company to show a profit?

A) 224,896
B) 321,280
C) 804
D) 1,148

Answer: D

Answer the question or solve the problem.

36) True or False? If $x < 4$ then $-6x < -24$.

A) True
B) False

Answer: B

37) True or False? If $x > 4$ then $4x > 16$.

A) True
B) False

Answer: A

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

38) Under what conditions must the inequality symbol be reversed when solving an inequality?

Answer: When multiplying or dividing by a negative number.

39) In solving the inequality $5x \leq -35$, would you have to reverse the inequality symbol? Explain why.

Answer: No, since you don't have to divide or multiply by a negative number. The fact that the number you are dividing into is negative is irrelevant. (Explanations will vary.)

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40) The three- part inequality $a < x \le b$ means "a is less than x and x is less than or equal to b". Which of these inequalities is not satisfied by any real number x?
(a) $-5 < x \le -11$
(b) $-8 < x \le -7$
(c) $0 < x \le 4$
(d) $-2 < x \le 6$

Answer: Choice (a) is not.

41) If $a < b$, is it always true that $\frac{1}{a} > \frac{1}{b}$? Explain.

Answer: No. The second statement only follows from the first if a and b are either both positive or both negative. Divide both sides of the original inequality by (ab). If a and b are of opposite signs, then $(ab) < 0$. When dividing by a negative number, the inequality sign must be reversed (thus, $\frac{a}{ab} > \frac{b}{ab}$, and $\frac{1}{b} > \frac{1}{a}$).In addition, if a (or b) is zero, then its reciprocal is undefined. (Explanations will vary.)

42) If $b < 0$, is it true that $b^2 > b$? Explain.

Answer: Yes, since $b^2 > 0 > b$.

43) If $a \le b$, is it always true that $a - 3 \le b - 3$? Explain.

Answer: Yes. Adding a positive or negative number to both sides of an inequality produces an equivalent inequality. (Explanations will vary.)

44) If $a \le b$, is it always true that $-8a \le -8b$? Explain.

Answer: No..Multiplying an inequality by a negative number requires reversing the inequality symbol. (Explanations will vary.)

45) If $a \le b$, is it always true that $a^2 \le b^2$? Explain.

Answer: No. It is only true that $a^2 \le b^2$ if $|a| \le |b|$. For example, it is true that $-5 \le -3$. However, it is not true that $(-5)^2 \le (-3)^2$ since $25 > 9$. (Explanations will vary.)

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Let A = {q, s, u, v, w, x, y, z}, B = {q, s, y, z}, C = {v, w, x, y, z}, and D = {s}. Specify the following set.

46) $A \cap B$
A) {v, x}
B) {q, s, y, z} or B
C) {q, s, u, v, w, y}
D) {s, u, v, w, x, z}

Answer: B

47) $A \cup B$
A) {s, u, w}
B) {s, u, v, w, x, z}
C) {q, s, u, v, w, x, y, z} or A
D) {v, x}

Answer: C

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48) $A \cap D$

A) {s, u, w}
B) {s} or D
C) {v, x}
D) {q, s, u, v, w, x, y}

Answer: B

49) $C \cup B$

A) {s, u, v, w, x, z}
B) {q, s, v, w, x, y, z}
C) {q, s, u, v, w, x, y}
D) {s, u, w}

Answer: B

50) $B \cap C$

A) {q, w, y}
B) {q, y, z}
C) {q, s, w, y, z}
D) {y, z}

Answer: D

51) $B \cup C$

A) {y, z}
B) {q, s, v, w, x, y, z}
C) {q, s, u, w, y, z}
D) {q, w, y, z}

Answer: B

52) $C \cup D$

A) {s, v, w, x, y, z}
B) {s, u, w, y, z}
C) {w, y}
D) {w, y, z}

Answer: A

53) $C \cap D$

A) {q, y, z}
B) {q, s, u, w, y, z}
C) ∅
D) {q, w, y}

Answer: C

54) $C \cup A$

A) {s, t}
B) {q, s, u, v, x, y, z}
C) ∅
D) {q, s, u, v, w, x, y, z} or A

Answer: D

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55) $A \cap \emptyset$

A) {q, s, u, v, x, z}

B) $\emptyset$

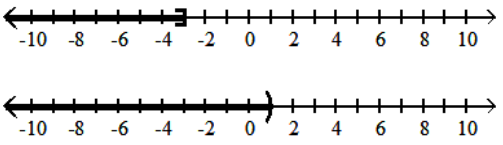
C) {q, s, u, v, w, x, y, z} or A

D) {w, y}

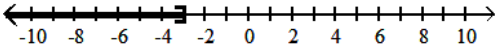
Answer: B

Graph the union or intersection of the two sets, as requested.

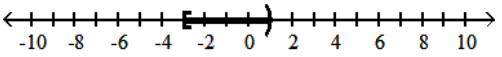
56) Intersection



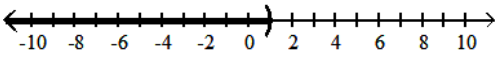
A)



B)

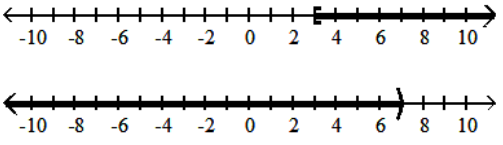


C)

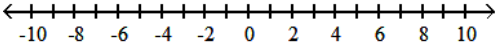


Answer: A

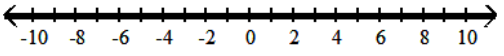
57) Intersection



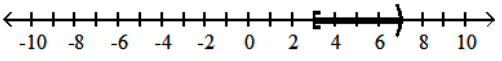
A)



B)



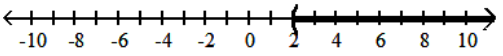
C)

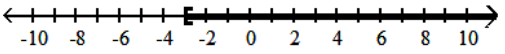


Answer: C

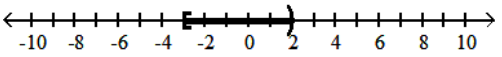
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58) Union

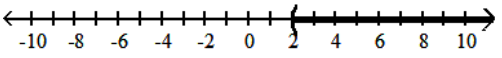




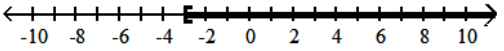
A)



B)

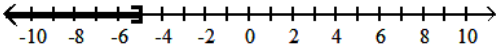


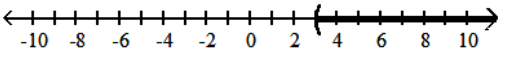
C)



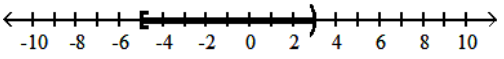
Answer: C

59) Union

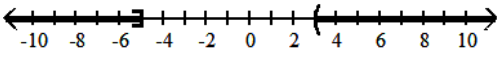




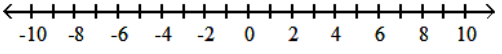
A)



B)



C)

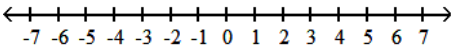


Answer: B

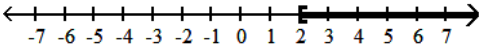
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For the compound inequality, give the solution set in both interval and graph forms.

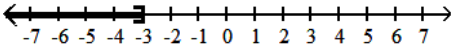
60) $x \geq 2$ and $x \geq -3$



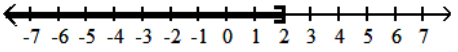
A) $[2, \infty)$



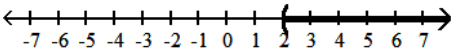
B) $(-\infty, -3]$



C) $(-\infty, 2]$

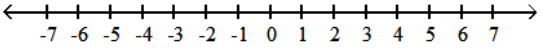


D) $(2, \infty)$

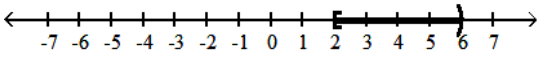


Answer: A

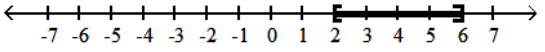
61) $6x + 10 \geq 22$ and $6x + 10 \leq 46$



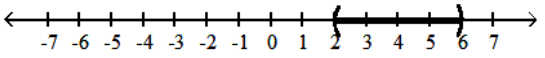
A) $[2, 6)$



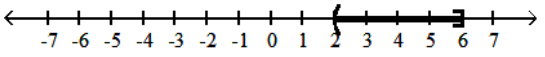
B) $[2, 6]$



C) $(2, 6)$



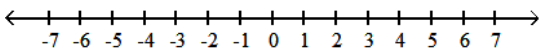
D) $(2, 6]$



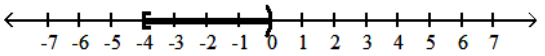
Answer: B

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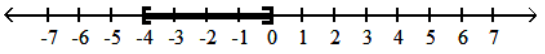
62) $-14 < 4x + 2$ and $7x + 7 < 7$



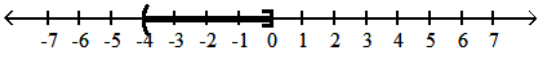
A) [- 4, 0)



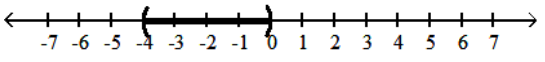
B) [- 4, 0]



C) (- 4, 0]

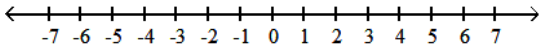


D) (- 4, 0)

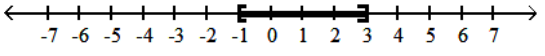


Answer: D

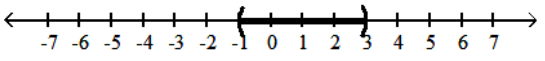
63) $-13 \le 5x - 8$ and $4x + 3 < 15$



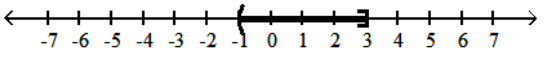
A) [- 1, 3]



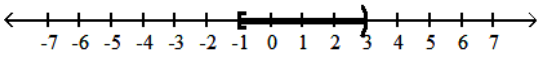
B) (- 1, 3)



C) (- 1, 3]



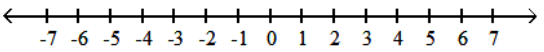
D) [- 1, 3)



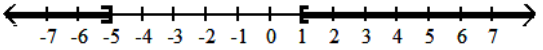
Answer: D

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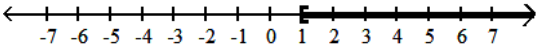
64) $5x + 6 \geq -19$ and $8x + 9 \geq 17$



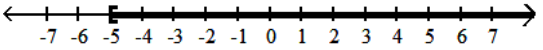
A) $(-\infty, -5] \cup [1, \infty)$



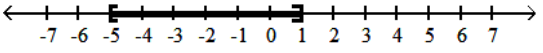
B) $[1, \infty)$



C) $[-5, \infty)$

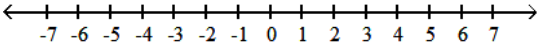


D) $[-5, 1]$

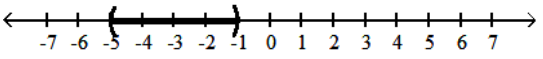


Answer: B

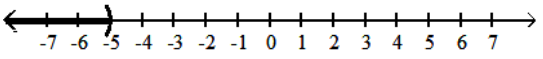
65) $5x + 9 < -16$ and $-8 - 9x > 1$



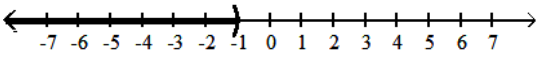
A) $(-5, -1)$



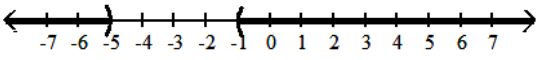
B) $(-\infty, -5)$



C) $(-\infty, -1)$



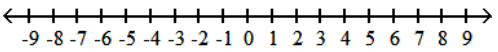
D) $(-\infty, -5) \cup (-1, \infty)$



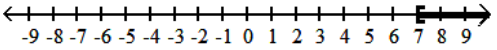
Answer: B

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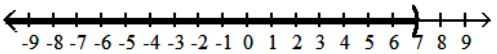
66) $4x - 10 \le 18$ and $2x - 1 \ge 13$



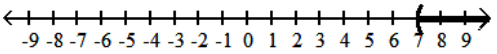
A) $[7, \infty)$



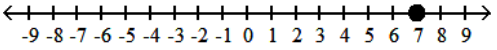
B) $(-\infty, 7)$



C) $(7, \infty)$

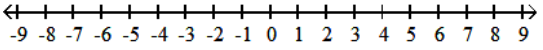


D) $\{7\}$

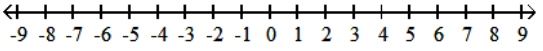


Answer: D

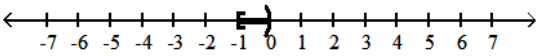
67) $4x > 4$ and $x + 5 < 5$



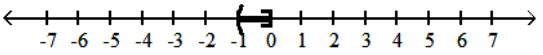
A) $\emptyset$



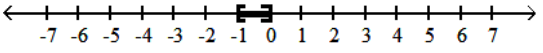
B) $[-1, 0)$



C) $(-1, 0]$



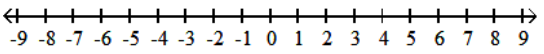
D) $[-1, 0]$



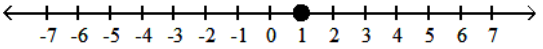
Answer: A

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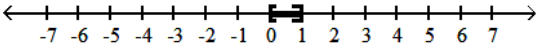
68) $5x - 1 < 4$ and $x - 2 > -1$



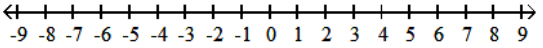
A) {1}



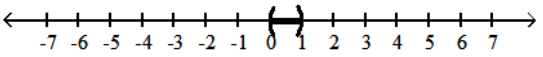
B) [0, 1]



C) ∅



D) (0, 1)

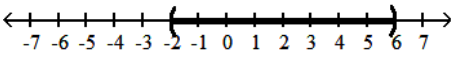


Answer: C

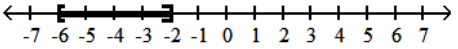
69) $x \leq 2$ or $x \geq 6$



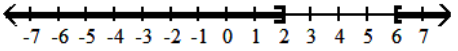
A) (- 2, 6)



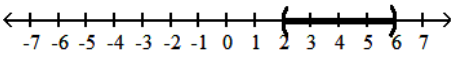
B) [- 6, - 2]



C) $(-\infty, 2] \cup [6, \infty)$



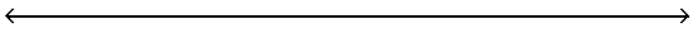
D) (2, 6)



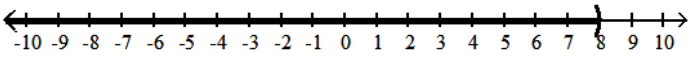
Answer: C

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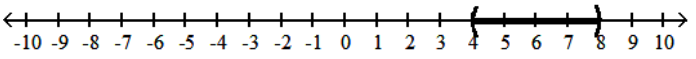
70) $x < 4$ or $x < 8$



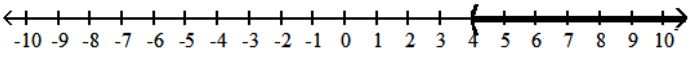
A) $(-\infty, 8)$



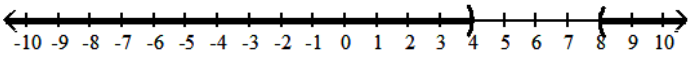
B) $(4, 8)$



C) $(4, \infty)$



D) $(-\infty, 4) \cup (8, \infty)$

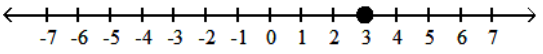


Answer: A

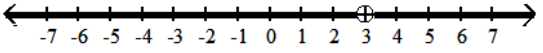
71) $x > 3$ or $x < 3$



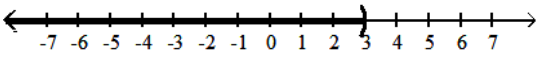
A) {3}



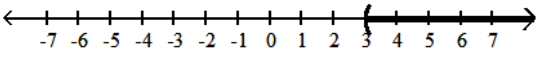
B) $(-\infty, 3) \cup (3, \infty)$



C) $(-\infty, 3)$



D) $(3, \infty)$



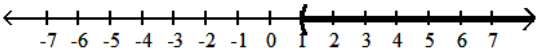
Answer: B

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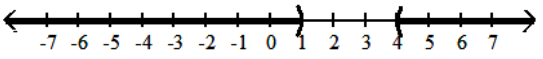
72) $x - 3 > 1$ or $x + 2 < 3$



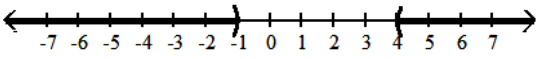
A) $(1, \infty)$



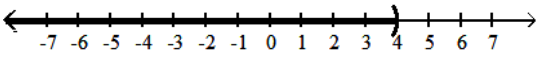
B) $(-\infty, 1) \cup (4, \infty)$



C) $(-\infty, -1) \cup (4, \infty)$

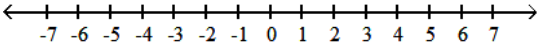


D) $(-\infty, 4)$

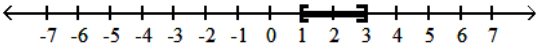


Answer: B

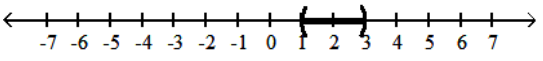
73) $12x - 8 < 4x$ or $-3x \leq -9$



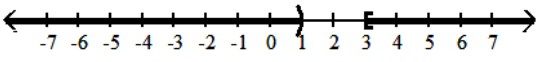
A) $[1, 3]$



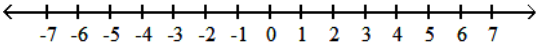
B) $(1, 3)$



C) $(-\infty, 1) \cup [3, \infty)$



D) $\emptyset$



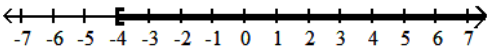
Answer: C

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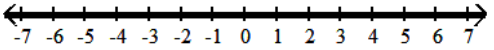
74) $-3x+1 \geq 7$ or $7x+3 \geq -25$



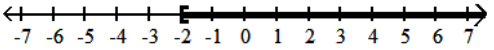
A) $[-4, \infty)$



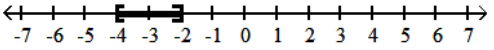
B) $(-\infty, \infty)$



C) $[-2, \infty)$



D) $[-4, -2]$



Answer: B

Express the set in the simplest interval form.

75) $(-\infty, 2) \cap (-2, \infty)$

A) $(-\infty, -2]$
B) $(-2, 2)$
C) $(-\infty, \infty)$
D) $[-2, 2)$

Answer: B

76) $(-2, 6] \cap (0, \infty)$

A) $[0, 6]$
B) $(-2, 6]$
C) $(-2, \infty)$
D) $(0, 6]$

Answer: D

77) $(-\infty, 5] \cup (-\infty, -7)$

A) $(-7, 5]$
B) $(-\infty, 5]$
C) $(-\infty, 5)$
D) $(-\infty, -7]$

Answer: B

78) $(-5, 4) \cup [-3, 9]$

A) $[-3, 4)$
B) $[-3, 9]$
C) $(-5, 4)$
D) $(-5, 9]$

Answer: D

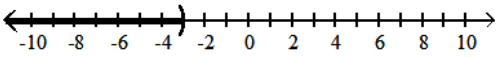
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For the compound inequality, decide whether intersection or union should be used. Then give the solution set in both interval and graph forms.

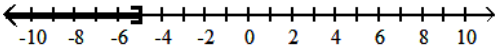
79) $x \leq -5$ and $x < -3$



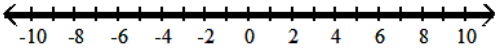
A) Union; $(-\infty, -3)$



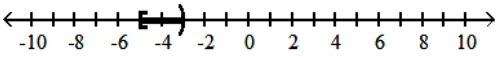
B) Intersection; $(-\infty, -5]$



C) Union; $(-\infty, \infty)$



D) Intersection; $[-5, -3)$

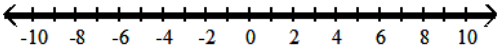


Answer: B

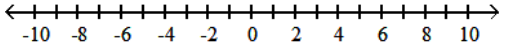
80) $x \geq -2$ and $x < 8$



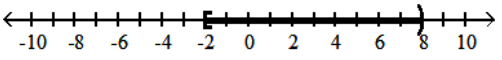
A) Union; $(-\infty, \infty)$



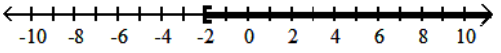
B) Intersection; $\emptyset$



C) Intersection; $[-2, 8)$



D) Intersection; $(-2, \infty)$



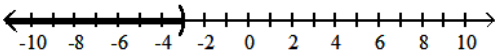
Answer: C

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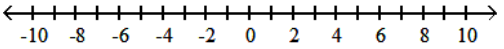
81) $x < -3$ or $x > -8$



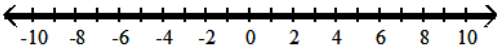
A) Intersection; $(-\infty, -3)$



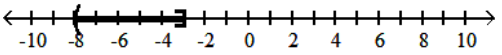
B) Intersection; $\emptyset$



C) Union; $(-\infty, \infty)$



D) Intersection; $[-8, -3)$

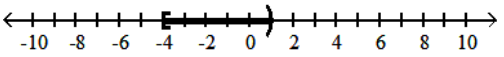


Answer: C

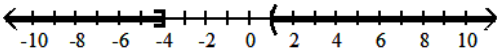
82) $x \leq -4$ or $x > 1$



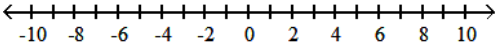
A) Union; $[-4, 1)$



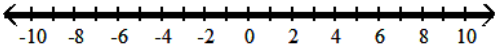
B) Union; $(-\infty, -4] \cup (1, \infty)$



C) Intersection; $\emptyset$



D) Union; $(-\infty, \infty)$



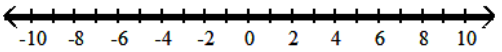
Answer: B

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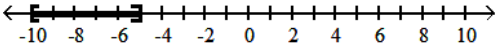
83) $2x + 1 \leq -19$ or $2x \geq -10$



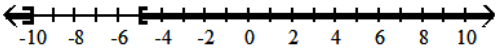
A) Union; $(-\infty, \infty)$



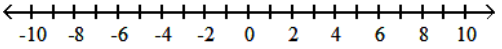
B) Intersection; $[-10, -5]$



C) Union; $(-\infty, -10] \cup [-5, \infty)$



D) Intersection; $\emptyset$



Answer: C

Each of six decorators has to paint a room (walls only) and put a wallpaper border around the room at the ceiling. One gallon of paint covers 400 sq ft, and one roll of border contains five yards. Each decorator has one gallon of paint and three rolls of border.

84) The list gives the names of each decorator and the size of the room.

Jane	9' x 12'
John	10' x 12'
Yong Sun	12' x 12'
Sun Woo	12' x 13'
Rosa	14' x 17'
Jose	13' x 15'

Give the names of the decorators who will have both enough paint and enough border for their rooms. (Assume a ceiling height of 8' for each room.)

A) {Rosa, Jose}
B) {Yong Sun, Sun Woo}
C) {Jane, John}
D) None

Answer: C

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85) The list gives the name of each decorator and the size of the room.

Jane	9' x 12'
Sam	10' x 12'
Yong Sun	12' x 12'
Sun Woo	12' x 13'
Rosa	14' x 17'
Manuel	13' x 15'

Give the names of the decorators who will have enough paint, but will not have enough border for their rooms. (Assume a ceiling height of 8' for each room.)

A) {Jane, Sam}
B) {Yong Sun, Sun Woo}
C) {Rosa, Manuel}
D) None

Answer: B

86) The list gives the name of each decorator and the size of the room.

Sue	9' x 12'
John	10' x 12'
Noriko	12' x 12'
Ajay	12' x 13'
Juanita	14' x 17'
Manuel	13' x 15'

Give the names of the decorators who will not have enough paint, but will have enough border for their rooms. (Assume a ceiling height of 8' for each room.)

A) {Sue, John}
B) {Juanita, Manuel}
C) {Noriko, Ajay}
D) None

Answer: D

87) The list gives the name of each decorator and the size of the room.

Sue	9' x 12'
Roger	10' x 12'
Noriko	12' x 12'
Ajay	12' x 13'
Juanita	14' x 17'
Pedro	13' x 15'

Give the names of the decorators who will have neither enough paint nor enough border. (Assume a ceiling height of 8' for each room.)

A) {Noriko, Ajay}
B) {Sue, Roger}
C) {Juanita, Pedro}
D) None

Answer: C

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88) The list gives the name of each decorator and the size of the room.

Mary	9' x 12'
Sam	10' x 12'
Yong Sun	12' x 12'
Ajay	12' x 13'
Juanita	14' x 17'
Manuel	13' x 15'

Give the names of the decorators who will have either enough paint or enough border or both. (Assume a ceiling height of 8' for each room.)

A) {Juanita, Manuel}
B) All
C) {Mary, Sam, Yong Sun, Ajay}
D) None

Answer: C

True or false?

89) $(A \cap B) \cap C = A \cap (B \cap C)$

A) True
B) False

Answer: A

90) $(A \cup B) \cap C = A \cup (B \cap C)$

A) True
B) False

Answer: B

91) The intersection of the sets $(-\infty, 7)$ and $(7, \infty)$ is $\{7\}$.

A) True
B) False

Answer: B

92) The union of the sets $(-\infty, -18]$ and $(-18, \infty)$ is $(-\infty, \infty)$

A) True
B) False

Answer: A

93) The intersection of the set of rational numbers and the set of whole numbers is the set of rational numbers.

A) True
B) False

Answer: B

94) The union of the set of rational numbers and the set of integers is the set of rational numbers.

A) True
B) False

Answer: A

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95) "You win if your card contains the number 23 or the number 45" is an example of union applied to a real- life situation.
A) True
B) False
Answer: A

96) The intersection of the set of positive numbers and the set of negative numbers is {0}.
A) True
B) False
Answer: B

97) The intersection of the set of nonpositive rational numbers and the set of whole numbers is {0}.
A) True
B) False
Answer: A

Solve the equation.

98) $|x| = 2$
A) {4}
B) {2, - 2}
C) {2}
D) {- 2}
Answer: B

99) $|x| = 1.4$
A) {1.4, - 1.4}
B) {1.4}
C) {196}
D) {- 1.4}
Answer: A

100) $|4x| = 36$
A) {- 9, 0}
B) {0, 9}
C) {- 9, 9}
D) {9}
Answer: C

101) $|t - 1| = 0$
A) $\emptyset$
B) $(-\infty, -1] \cup [1, \infty)$
C) {- 1}
D) {1}
Answer: D

102) $|b - 9| = 5$
A) {14, 4}
B) {14}
C) $\emptyset$
D) {- 14, - 4}
Answer: A

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103) $|7m + 6| = 9$

A) $\emptyset$

B) $\left\{\frac{1}{2}, -\frac{5}{2}\right\}$

C) $\left\{\frac{3}{7}, -\frac{15}{7}\right\}$

D) $\left\{-\frac{3}{7}, \frac{15}{7}\right\}$

Answer: C

104) $|6 - 3p| = 30$

A) {- 12, 8}

B) {- 12, - 8}

C) {12}

D) {- 8, 12}

Answer: D

105) $\left|3 + \frac{1}{3}x\right| = 3$

A) $\emptyset$

B) {0, 18}

C) [18, 0}

D) {- 18, 0}

Answer: D

106) $\left|8 - \frac{4}{9}x\right| = 3$

A) {5, 11}

B) {- 11, 5}

C) $\left\{\frac{99}{4}, \frac{45}{4}\right\}$

D) $\left\{-\frac{99}{4}, \frac{45}{4}\right\}$

Answer: C

107) $|0.01x - 7| = 5.85$

A) {- 115, 1,285}

B) {0, 1,285}

C) {1,285}

D) {115, 1,285}

Answer: D

108) $|6 - 0.02x| = 6$

A) {0, 600}

B) {300}

C) {0, 300}

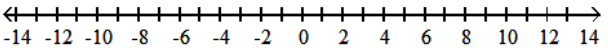
D) {600}

Answer: A

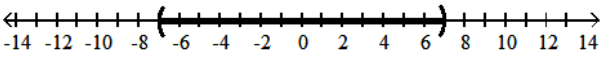
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Solve the inequality and graph the solution set.

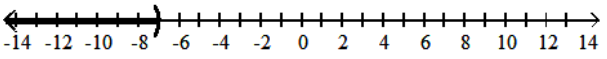
109) $|x| > 7$



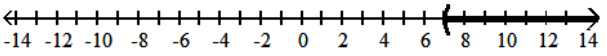
A) $(-7, 7)$



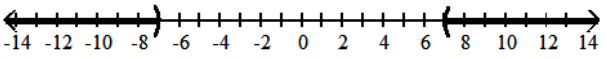
B) $(-7, \infty)$



C) $(7, \infty)$

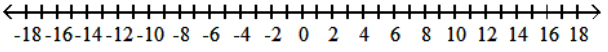


D) $(-\infty, -7) \cup (7, \infty)$

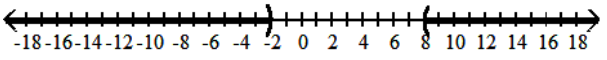


Answer: D

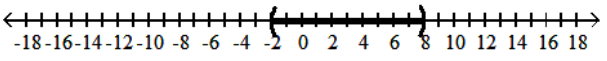
110) $|r - 3| > 5$



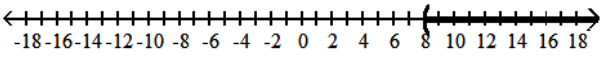
A) $(-\infty, -2) \cup (8, \infty)$



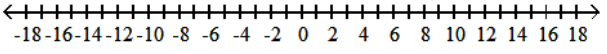
B) $(-2, 8)$



C) $(8, \infty)$



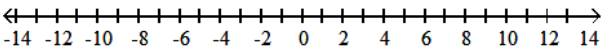
D) $\emptyset$



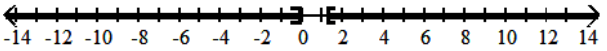
Answer: A

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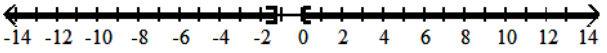
111) $|7x - 4| \geq 5$



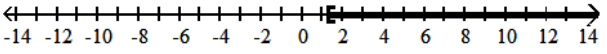
A) $\left(-\infty, -\frac{1}{7}\right] \cup \left[\frac{9}{7}, \infty\right)$



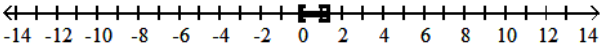
B) $\left(-\infty, -\frac{9}{7}\right] \cup \left[\frac{1}{7}, \infty\right)$



C) $\left[\frac{9}{7}, \infty\right)$

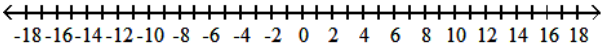


D) $\left[-\frac{1}{7}, \frac{9}{7}\right]$

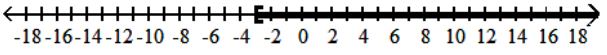


Answer: A

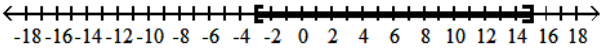
112) $|6 - x| \geq 9$



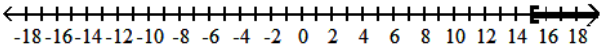
A) $[-3, \infty)$



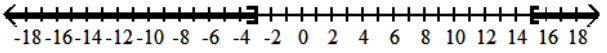
B) $[-3, 15]$



C) $[15, \infty)$



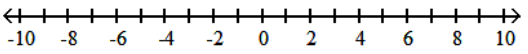
D) $(-\infty, -3] \cup [15, \infty)$



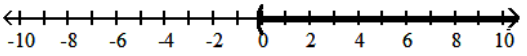
Answer: D

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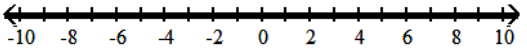
113) $|7y - 2| > -3$



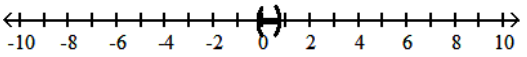
A) $\left(-\frac{1}{7}, \infty\right]$



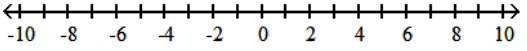
B) $(-\infty, \infty)$



C) $\left(-\frac{1}{7}, \frac{5}{7}\right)$

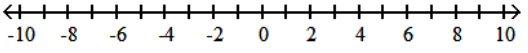


D) $\emptyset$

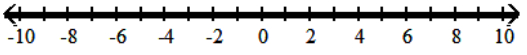


Answer: B

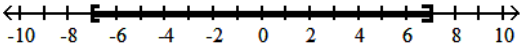
114) $|z + 7| \geq 0$



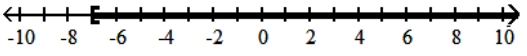
A) $(-\infty, \infty)$



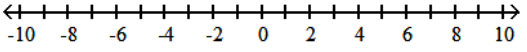
B) $[-7, 7]$



C) $[-7, \infty)$



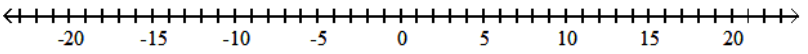
D) $\emptyset$



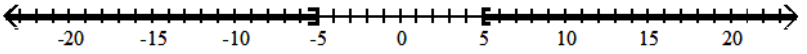
Answer: A

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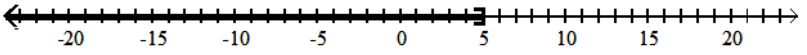
115) $|x| \leq 5$



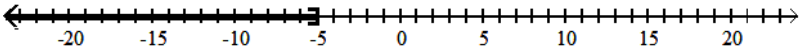
A) $(-\infty, -5] \cup [5, \infty)$



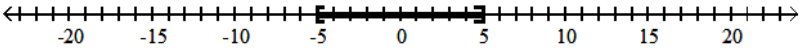
B) $(-\infty, 5]$



C) $(-\infty, -5]$

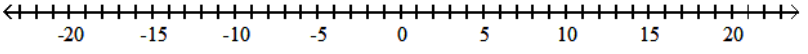


D) $[-5, 5]$

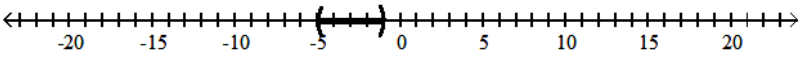


Answer: D

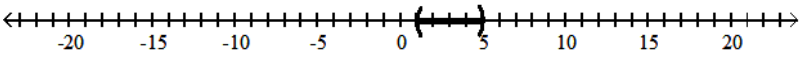
116) $|g + 2| < 3$



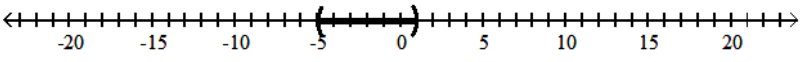
A) $(-5, -1)$



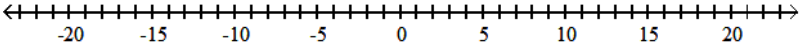
B) $(5, 1)$



C) $(-5, 1)$



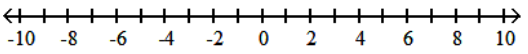
D) $\varnothing$



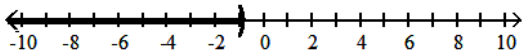
Answer: C

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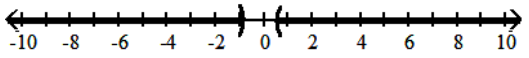
117) $|6x + 1| < 4$



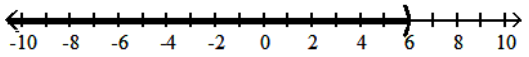
A) $\left(-\infty, -\frac{5}{6}\right]$



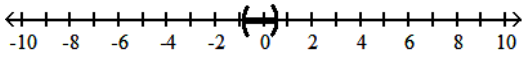
B) $\left(-\infty, -\frac{5}{6}\right] \cup \left(\frac{1}{2}, \infty\right)$



C) $(-\infty, 6)$

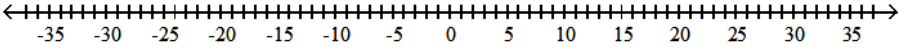


D) $\left(-\frac{5}{6}, \frac{1}{2}\right)$

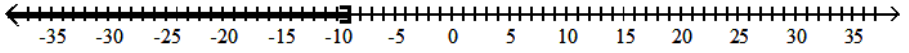


Answer: D

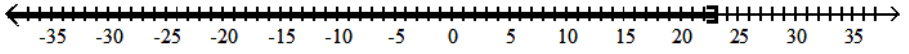
118) $|7 - x| \leq 16$



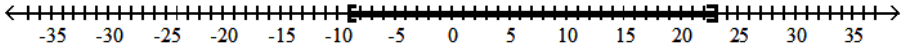
A) $(-\infty, -9]$



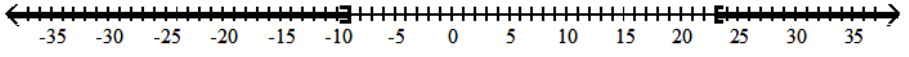
B) $(-\infty, 23]$



C) $[-9, 23]$



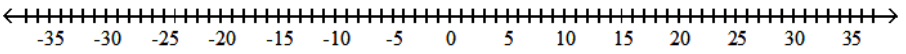
D) $(-\infty, -9] \cup [23, \infty)$



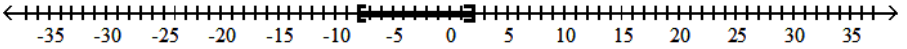
Answer: C

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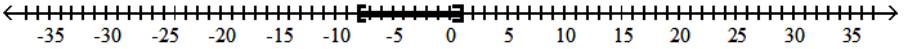
119) $|h + 3| \leq 5$



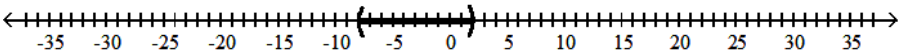
A) [- 8, 2]



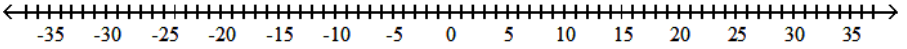
B) [- 8, 1]



C) (- 8, 2)

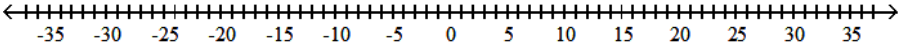


D) ∅

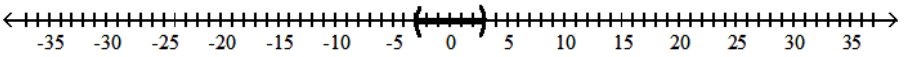


Answer: A

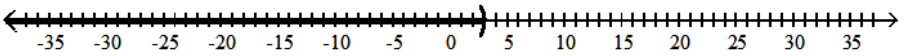
120) $|m - 3| < 0$



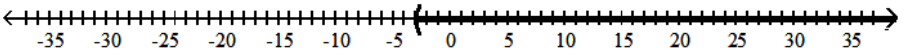
A) (- 3, 3)



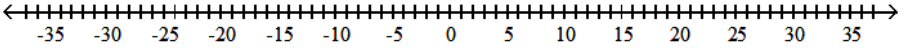
B) (- ∞, 3)



C) (- 3, ∞)



D) ∅



Answer: D

Solve the given equation or inequality. If an equation is given, then write the solution set in set notation. If an inequality is given, then write the solution set in interval notation.

121) $|x| + 7 = 19$

A) {12}

B) {- 12, 12}

C) {- 19}

D) {- 19, 19}

Answer: B

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122) $|y + 1| - 5 = 14$

A) {19, - 19}
B) {20, 19}
C) {18, - 20}
D) {18}

Answer: C

123) $|h + 6| - 9 \leq -2$

A) ∅
B) [- 13,- 2]
C) (- 13,1)
D) [- 13,1]

Answer: D

124) $|5k - 8| - 3 < 2$

A) $\left(-\infty, \frac{3}{5}\right) \cup \left(\frac{13}{5}, \infty\right)$
B) ∅
C) $\left(-\infty, \frac{3}{5}\right)$
D) $\left(\frac{3}{5}, \frac{13}{5}\right)$

Answer: D

125) $|3x - 9| - 5 < -9$

A) $\left(-\infty, \frac{13}{3}\right)$
B) $\left(-\infty, \frac{13}{3}\right) \cup \left(\frac{5}{3}, \infty\right)$
C) $\left(-\infty, \frac{5}{3}\right)$
D) ∅

Answer: D

126) $|3y - 1| - 5 > -14$

A) $(-\infty, \infty)$
B) $\left(-\frac{8}{3}, \infty\right)$
C) $\left(-\frac{8}{3}, \frac{10}{3}\right)$
D) ∅

Answer: A

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127) $\left|\frac{1}{3}x+\frac{1}{3}\right|+\frac{1}{4}=\frac{7}{4}$

A) $\left\{\frac{7}{2}\right\}$

B) $\left\{0, \frac{7}{2}\right\}$

C) $\left\{-\frac{11}{2}, \frac{7}{2}\right\}$

D) $\left(-\infty, -\frac{11}{2}\right] \cup \left[\frac{7}{2}, \infty\right)$

Answer: C

128) $|0.5x - 3.6| + 0.2 \geq 0.7$

A) $(-\infty, 6.2] \cup [8.2, \infty)$

B) $(6.2, 8.2)$

C) $\{6.2, 8.2\}$

D) $(-\infty, 6.2] \cap [8.2, \infty)$

Answer: A

Solve the equation.

129) $\left|\frac{1}{2}n+2\right| = \left|\frac{3}{4}n-2\right|$

A) {16, 0}

B) {16, 12}

C) ∅

D) {0}

Answer: A

130) $|2s+1| = |s-8|$

A) $\left\{-9, \frac{7}{3}\right\}$

B) $\{-9\}$

C) $\left\{9, -\frac{7}{3}\right\}$

D) ∅

Answer: A

131) $|2s+5| = |s-4|$

A) $\{-9\}$

B) $\left\{9, \frac{1}{3}\right\}$

C) $\left\{-9, -\frac{1}{3}\right\}$

D) ∅

Answer: C

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132) $|9s - 9| = |s - 1|$

A) $\{1, 1\}$

B) $\emptyset$

C) $\left\{1, -\frac{17}{8}\right\}$

D) $\left\{-1, -\frac{5}{4}\right\}$

Answer: A

133) $|n - 3| = |4 - n|$

A) {7}

B) $\left\{\frac{1}{2}\right\}$

C) $\left\{\frac{7}{2}\right\}$

D) $\emptyset$

Answer: C

134) $|n - 3| = |4 - n|$

A) {7}

B) $\left\{\frac{7}{2}\right\}$

C) $\emptyset$

D) $\left\{\frac{1}{2}\right\}$

Answer: B

135) $|2s - 3| = |s - 9|$

A) $\{-6, 4\}$

B) $\{-6\}$

C) $\{6, -4\}$

D) $\emptyset$

Answer: A

Solve the equation or inequality.

136) $|x| = -19$

A) $\emptyset$

B) $\left\{\frac{1}{19}\right\}$

C) {-19}

D) {19}

Answer: A

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137) $|2f - 7| = -3$

A) $\emptyset$

B) $\{5, -2\}$

C) $\{2\}$

D) $\left\{-\frac{3}{2}, 2\right\}$

Answer: A

138) $|m - 3| = 0$

A) $(-\infty, 3)$

B) $\{3\}$

C) $(-3, \infty)$

D) $\{-3, 3\}$

Answer: B

139) $|-4x + 8| > -4$

A) $(-\infty, 3)$

B) $(-\infty, \infty)$

C) $(1, 3)$

D) $\emptyset$

Answer: B

140) $|x + 6| \leq 0$

A) $\{-6\}$

B) $\{6\}$

C) $\emptyset$

D) $(-\infty, -6)$

Answer: A

141) $|z + 1| \geq 0$

A) $(-\infty, -1) \cup (-1, \infty)$

B) $(-\infty, \infty)$

C) $[-1, 1]$

D) $\emptyset$

Answer: B

142) $|4x - 7| + 3 < 1$

A) $\left(-\infty, \frac{9}{4}\right)$

B) $\left(-\infty, \frac{5}{4}\right)$

C) $\emptyset$

D) $\left(\frac{5}{4}, \frac{9}{4}\right)$

Answer: C

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143) $|7x - 6| - 4 > -13$

A) $\left(-\frac{3}{7}, \infty\right)$

B) $(-\infty, \infty)$

C) $\left(-\frac{3}{7}, \frac{15}{7}\right)$

D) $\emptyset$

Answer: B

Provide an appropriate response.

144) Determine which of the following is used to solve the equation $|ax + b| = c$, for $c > 0$.

A) $ax + b = c$ and $ax + b = -c$

B) $ax + b = c$ or $ax + b = -c$

C) $ax + b = c$

D) $ax + b = -c$

Answer: B

145) Determine which of the following is used to solve the inequality $|ax + b| < c$, for $c > 0$.

A) $ax + b < c$ or $ax + b < -c$

B) $-c < ax + b > c$

C) $-c < ax + b < c$

D) $ax + b < c$

Answer: C

146) Determine which of the following is used to solve the inequality $|ax + b| > c$, for $c > 0$.

A) $ax + b > c$ and $ax + b < -c$

B) $ax + b > c$ or $ax + b > -c$

C) $ax + b < c$ and $ax + b > -c$

D) $ax + b > c$ or $ax + b < -c$

Answer: D

147) Give the number of solutions for $|ax + b| = k$ if $k < 0$.

A) 2

B) 0

C) An infinite number

D) 1

Answer: B

148) Give the number of solutions for $|ax + b| > k$ if $k < 0$.

A) 0

B) An infinite number

C) 1

D) 2

Answer: B

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149) Give an equation or inequality that states the distance between 4x and 6.6 is equal to 8.

A) $|4x - 6.6| < 8$

B) $|4x + 6.6| < -8$

C) $4x - 6.6 = 8$

D) $|4x - 6.6| = 8$

Answer: D

Solve the equation.

150) $5(6x + 2) - 5(x - 4) = 3x - 348 + x$

A) {- 8}

B) {2}

C) {- 18}

D) {12}

Answer: C

151) $0.8x - 0.4(20 + x) = 20$

A) {80}

B) {60}

C) {35}

D) {70}

Answer: D

152) $\frac{x + 3}{24} + \frac{x - 6}{12} = \frac{x - 3}{8}$

A) ∅

B) {- 18}

C) {6}

D) $(-\infty, \infty)$

Answer: D

Solve the equation. Then tell whether the equation is a conditional equation, an identity, or a contradiction.

153) $3x - (1 - x) + 5x + 1 = 9x + 3$

A) ∅; contradiction

B) $(-\infty, \infty)$; identity

C) {5}; conditional equation

D) {3}; conditional equation

Answer: A

154) $\frac{x}{2} + 6 = \frac{5x}{6} - 5 - \frac{x}{3} + 11$

A) $(-\infty, \infty)$; identity

B) {0}; conditional equation

C) ∅; contradiction

D) {5}; conditional equation

Answer: A

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155) $-3(3x+3) = -4 - 6x - 8x$

A) $(-\infty, \infty)$; identity

B) {1}; conditional equation

C) $\emptyset$; contradiction

D) {-1}; conditional equation

Answer: B

Solve.

156) $-6y^2 + wy - x = 0$ for w

A) $w = \dfrac{x + 6y^2}{y}$

B) $w = \dfrac{x - 6y^2}{y}$

C) $w = \dfrac{6y^2 + y}{x}$

D) $w = -\dfrac{x + 6y^2}{y}$

Answer: A

157) $8s + 2p = tp - 2$ for p

A) $p = \dfrac{2 - t}{-8s - 2}$ or $p = \dfrac{t - 2}{8s + 2}$

B) $p = \dfrac{8s + 2}{-t}$ or $p = \dfrac{-8s - 2}{t}$

C) $p = \dfrac{-8s - 2}{2 - t}$ or $p = \dfrac{8s + 2}{t - 2}$

D) $p = \dfrac{8s + 2}{2}$ or $p = \dfrac{-8s - 2}{-2}$

Answer: C

Solve the problem.

158) A plane climbs from an altitude of 16,000 ft to a cruising altitude of 34,000 ft. The plane ascends at a rate of 4,500 ft/min. How long will it take to reach cruising altitude?

A) 81,000,000 min

B) 11 min

C) 0.3 min

D) 4 min

Answer: D

159) A certificate of deposit pays $2,048.75 in simple interest for 1 yr on a principal on $27,500. What is the rate of interest?

A) 7.5%

B) 8.45%

C) 7.45%

D) 7.4%

Answer: C

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160) Best Office Machines spent $37,740 this year on utility costs alone. If total sales were $372,500, what percent of total sales was spent on utility costs? Round to the nearest tenth of a percent, if necessary.

A) 1%
B) 9.9%
C) 10.1%
D) 99%

Answer: C

161) Walt made an extra $5,000 last year from a part- time job. He invested part of the money at 9% and the rest at 7%. He made a total of $370 in interest. How much did he invest at each rate?

A) $4,000 at 7%; $3,000 at 9%
B) $2,500 at 7%; $1,000 at 9%
C) $1,000 at 7%; $4,000 at 9%
D) $4,000 at 7%; $1,000 at 9%

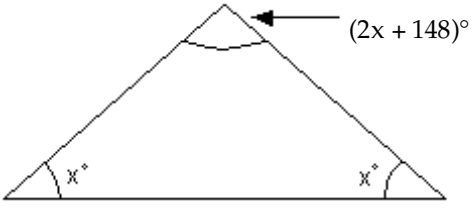
Answer: D

162) Jill is 13.5 kilometers away from Joe. Both begin to walk toward each other at the same time. Jill walks at 1.5 km/hr. They meet in 3 hours. How fast is Joe walking?

A) 3 km/hr
B) 9 km/hr
C) 6 km/hr
D) 2.25 km/hr

Answer: A

163) Find the measure of each angle.



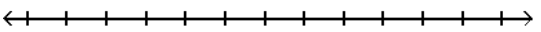
A) 18°, 18°, 144°
B) 8°, 8°, 164°
C) 10°, 10°, 160°
D) 4°, 4°, 172°

Answer: B

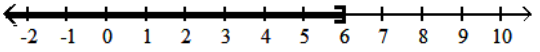
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Solve the inequality. Give the solution set in both interval and graph forms.

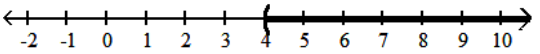
164) $4 - 6(x + 9) \leq -20 - 9(x + 6) + 9x$



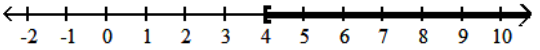
A) $(-\infty, 4]$



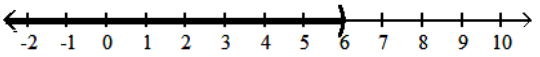
B) $(4, \infty)$



C) $[4, \infty)$

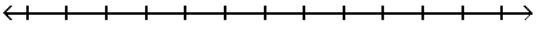


D) $(-\infty, 4)$

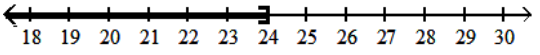


Answer: C

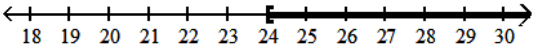
165) $-\frac{1}{2}x > -12$



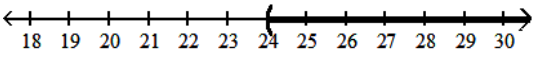
A) $(-\infty, 24]$



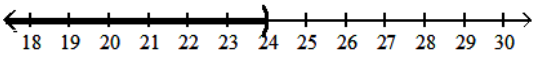
B) $[24, \infty)$



C) $(24, \infty)$



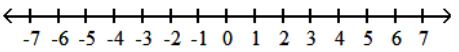
D) $(-\infty, 24)$



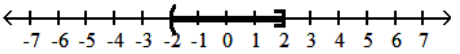
Answer: D

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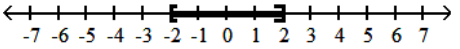
166) $-5 < 5z + 5 \leq 15$



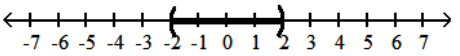
A) $(-2, 2]$



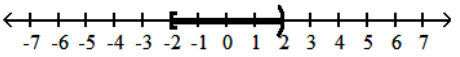
B) $[-2, 2]$



C) $(-2, 2)$

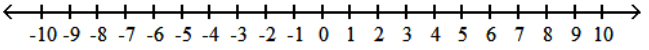


D) $[-2, 2)$

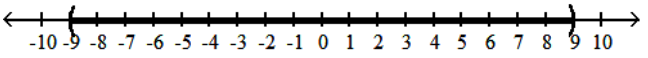


Answer: A

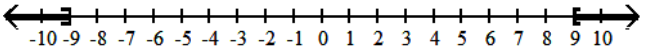
167) $-8 \leq \frac{2}{3}x - 2 \leq 4$



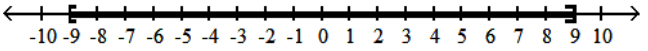
A) $(-9, 9)$



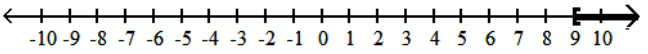
B) $(-\infty, -9] \cup [9, \infty)$



C) $[-9, 9]$



D) $[9, \infty)$



Answer: C

Solve the problem.

168) Which one of the following inequalities is equivalent to $z \geq 2$?

A) $-5z \geq --10$

B) $-5z \leq --10$

C) $-5z \leq -10$

D) $-5z \geq -10$

Answer: C

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169) Raymond plans on playing 5 rounds of golf while on vacation. He wants his average to be 90 or less. His scores for the first 4 rounds were 88, 92, 90, and 89. What does he need to score on the last round to meet his goal?

A) 81 or less
B) 90 or more
C) 87 or less
D) 91 or less

Answer: D

Find the indicated intersection or union.

170) Let A = {4, 9, 10, 15, 23} and B = {9, 15, 23, 30}. Write the set $A \cap B$.

A) {9, 15, 23, 30}
B) {4, 9, 15, 23}
C) {4, 9, 10, 15, 23, 30}
D) {9, 15, 23}

Answer: D

171) Let A = {2, 5, 14, 16} and B = {5, 16, 23, 29}. Write the set $A \cup B$.

A) {2, 5, 16, 23}
B) {5, 16}
C) {5, 16, 23}
D) {2, 5, 14, 16, 23, 29}

Answer: D

Solve the compound or absolute value inequality.

172) $-6 \le 7x + 8$ and $7x + 2 < 16$

A) [- 2, 2]
B) (- 2, 2)
C) [- 2, 2)
D) (- 2, 2]

Answer: C

173) $-4x \le -12$ or $6x - 4 < 2x$

A) $(-\infty, 1) \cup [3, \infty)$
B) (1, 3)
C) [1, 3]
D) $\emptyset$

Answer: A

174) $|7x - 4| < 8$

A) $\emptyset$
B) $\left(-\frac{4}{7}, \frac{12}{7}\right)$
C) $\left(-\infty, -\frac{4}{7}\right)$
D) $\left(-\infty, -\frac{4}{7}\right) \cup \left(\frac{12}{7}, \infty\right)$

Answer: B

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175) $|2 - 6x| \geq 6$

A) $\left(-\infty, -\frac{2}{3}\right] \cup \left[\frac{4}{3}, \infty\right)$

B) $\left(-\infty, -\frac{4}{3}\right] \cup [6, \infty)$

C) $\left[-\frac{2}{3}, \frac{4}{3}\right]$

D) $[\frac{4}{3}, \infty)$

Answer: A

176) $|y - 5| \leq -10$

A) $(-\infty, \infty)$

B) $\emptyset$

C) $[5, 14]$

D) $[7, 14]$

Answer: B

177) $|-7x + 4| + 9 < 11$

A) $\left(-\infty, \frac{2}{7}\right)$

B) $\left(\frac{2}{7}, \frac{6}{7}\right)$

C) $\left(-\infty, \frac{2}{7}\right) \cup \left(\frac{6}{7}, \infty\right)$

D) $\emptyset$

Answer: B

Solve the absolute value equation.

178) $|8k - 5| - 9 = -3$

A) $(-\infty, \infty)$

B) $\left\{\frac{8}{11}, -8\right\}$

C) $\left\{-\frac{1}{8}, \frac{11}{8}\right\}$

D) $\emptyset$

Answer: C

179) $|5s + 9| = |-3 - s|$

A) $\left\{-\frac{3}{2}, -\frac{1}{2}\right\}$

B) $\left\{\frac{3}{2}, 2\right\}$

C) $\{-\frac{3}{2}\}$

D) $\left\{-\frac{3}{2}, -2\right\}$

Answer: D

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Answer the question.

180) If $k < 0$, what is the solution set of $|6f - 4| < k$

A) {0}

B) ∅

C) $\left(-\frac{k-4}{6}, \frac{k-4}{6}\right)$

D) $(-\infty, \infty)$

Answer: B

181) If $k < 0$, what is the solution set of $|5f - 4| > k$

A) $(-\infty, \infty)$

B) ∅

C) $\left(-\frac{k-4}{5}, \frac{k-4}{5}\right)$

D) {0}

Answer: A

182) If $k < 0$, what is the solution set of $|5f - 8| = k$

A) $\left\{\frac{k-8}{5}\right\}$

B) $(-\infty, \infty)$

C) {0}

D) ∅

Answer: D

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1) A
2) B
3) C
4) C
5) C
6) D
7) C
8) A
9) C
10) B
11) C
12) C
13) A
14) D
15) D
16) A
17) C
18) A
19) D
20) C
21) B
22) B
23) A
24) A
25) A
26) A
27) B
28) B
29) D
30) D
31) C
32) A
33) C
34) A
35) D
36) B
37) A
38) When multiplying or dividing by a negative number.
39) No, since you don't have to divide or multiply by a negative number. The fact that the number you are dividing into is negative is irrelevant. (Explanations will vary.)
40) Choice (a) is not.
41) No. The second statement only follows from the first if a and b are either both positive or both negative. Divide both sides of the original inequality by (ab). If a and b are of opposite signs, then (ab) < 0. When dividing by a negative number, the inequality sign must be reversed (thus, $\frac{a}{ab} > \frac{b}{ab}$, and $\frac{1}{b} > \frac{1}{a}$).In addition, if a (or b) is zero, then its reciprocal is undefined. (Explanations will vary.)
42) Yes, since $b^2 > 0 > b$.
43) Yes. Adding a positive or negative number to both sides of an inequality produces an equivalent inequality. (Explanations will vary.)

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44) No..Multiplying an inequality by a negative number requires reversing the inequality symbol. (Explanations will vary.)
45) No. It is only true that $a^2 \le b^2$ if $|a| \le |b|$. For example, it is true that $-5 \le -3$. However, it is not true that $(-5)^2 \le (-3)^2$ since $25 > 9$. (Explanations will vary.)
46) B
47) C
48) B
49) B
50) D
51) B
52) A
53) C
54) D
55) B
56) A
57) C
58) C
59) B
60) A
61) B
62) D
63) D
64) B
65) B
66) D
67) A
68) C
69) C
70) A
71) B
72) B
73) C
74) B
75) B
76) D
77) B
78) D
79) B
80) C
81) C
82) B
83) C
84) C
85) B
86) D
87) C
88) C
89) A
90) B
91) B

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92) A
93) B
94) A
95) A
96) B
97) A
98) B
99) A
100) C
101) D
102) A
103) C
104) D
105) D
106) C
107) D
108) A
109) D
110) A
111) A
112) D
113) B
114) A
115) D
116) C
117) D
118) C
119) A
120) D
121) B
122) C
123) D
124) D
125) D
126) A
127) C
128) A
129) A
130) A
131) C
132) A
133) C
134) B
135) A
136) A
137) A
138) B
139) B
140) A
141) B

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142) C
143) B
144) B
145) C
146) D
147) B
148) B
149) D
150) C
151) D
152) D
153) A
154) A
155) B
156) A
157) C
158) D
159) C
160) C
161) D
162) A
163) B
164) C
165) D
166) A
167) C
168) C
169) D
170) D
171) D
172) C
173) A
174) B
175) A
176) B
177) B
178) C
179) D
180) B
181) A
182) D

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