College Algebra and Trigonometry 7th edition Lial Test Bank

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

Write the fraction in lowest terms.

1) $\frac{2}{6}$

A) 3 B) 5 C) $\frac{2}{6}$ D) $\frac{1}{3}$

Answer: D

2) $\frac{9}{12}$

A) $\frac{11}{8}$ B) $\frac{10}{13}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$

Answer: C

3) $\frac{24}{57}$

A) $\frac{8}{19}$ B) $\frac{24}{57}$ C) $\frac{56}{23}$ D) $\frac{19}{8}$

Answer: A

4) $\frac{58}{192}$

A) $\frac{59}{193}$ B) $\frac{96}{29}$ C) $\frac{29}{96}$ D) $\frac{191}{57}$

Answer: C

5) $\frac{183}{288}$

A) $\frac{96}{61}$ B) $\frac{184}{289}$ C) $\frac{41}{26}$ D) $\frac{61}{96}$

Answer: D

6) $\frac{25}{850}$

A) $\frac{283}{8}$ B) $\frac{26}{851}$ C) 34 D) $\frac{1}{34}$

Answer: D

7) $\frac{340}{500}$

A) $\frac{25}{17}$ B) $\frac{341}{501}$ C) $\frac{499}{339}$ D) $\frac{17}{25}$

Answer: D

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8) $\frac{48}{30}$

A) $\frac{5}{8}$ B) $\frac{8}{5}$ C) $\frac{48}{30}$ D) $\frac{6}{5}$

Answer: B

Write the improper fraction as a mixed number.

9) $\frac{46}{3}$

A) $\frac{1}{3}$ B) $14\frac{1}{7}$ C) $15\frac{1}{3}$ D) $16\frac{1}{3}$

Answer: C

10) $\frac{34}{5}$

A) $6\frac{4}{7}$ B) $7\frac{4}{5}$ C) $6\frac{4}{5}$ D) $5\frac{4}{5}$

Answer: C

11) $\frac{11}{2}$

A) $4\frac{1}{2}$ B) $5\frac{1}{2}$ C) $6\frac{1}{2}$ D) $5\frac{1}{7}$

Answer: B

12) $\frac{24}{7}$

A) $\frac{7}{24}$ B) $3\frac{3}{7}$ C) $24\frac{24}{7}$ D) $24\frac{7}{24}$

Answer: B

13) $\frac{123}{7}$

A) $\frac{7}{123}$ B) $17\frac{4}{7}$ C) $123\frac{123}{7}$ D) $123\frac{7}{123}$

Answer: B

14) $\frac{40}{11}$

A) $7\frac{2}{11}$ B) $3\frac{7}{11}$ C) $7\frac{3}{11}$ D) $3\frac{6}{11}$

Answer: B

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15) $\frac{55}{12}$

A) $7\frac{1}{12}$ B) $12\frac{1}{12}$ C) $7\frac{7}{12}$ D) $4\frac{7}{12}$

Answer: D

Write the mixed number as an improper fraction.

16) $7\frac{2}{3}$

A) $\frac{21}{2}$ B) $\frac{23}{3}$ C) $\frac{23}{2}$ D) $\frac{21}{3}$

Answer: B

17) $2\frac{3}{7}$

A) $\frac{14}{7}$ B) $\frac{14}{3}$ C) $\frac{17}{7}$ D) $\frac{17}{3}$

Answer: C

18) $3\frac{4}{7}$

A) $\frac{25}{4}$ B) $\frac{25}{7}$ C) $\frac{21}{7}$ D) $\frac{21}{4}$

Answer: B

19) $7\frac{5}{7}$

A) $\frac{54}{7}$ B) $\frac{49}{7}$ C) $\frac{49}{5}$ D) $\frac{54}{5}$

Answer: A

20) $12\frac{7}{10}$

A) $\frac{19}{10}$ B) $\frac{84}{10}$ C) $\frac{137}{10}$ D) $\frac{127}{10}$

Answer: D

Multiply as indicated. Write the answer as a fraction in lowest terms.

21) $\frac{1}{3} \cdot \frac{1}{3}$

A) 1 B) $\frac{1}{6}$ C) $\frac{1}{9}$ D) $\frac{1}{3}$

Answer: C

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22) $\frac{7}{9} \cdot \frac{1}{2}$

A) $\frac{9}{14}$ B) $\frac{7}{18}$ C) $\frac{7}{54}$ D) $\frac{2}{3}$

Answer: B

23) $\frac{5}{6} \cdot \frac{4}{7}$

A) $\frac{10}{21}$ B) $\frac{5}{126}$ C) $\frac{17}{27}$ D) $\frac{24}{35}$

Answer: A

24) $\frac{14}{15} \cdot \frac{4}{7}$

A) $\frac{8}{15}$ B) $\frac{40}{51}$ C) $\frac{2}{45}$ D) $\frac{30}{49}$

Answer: A

25) $\frac{5}{14} \cdot \frac{5}{14}$

A) $\frac{5}{14}$ B) $\frac{25}{196}$ C) $\frac{5}{392}$ D) 1

Answer: B

26) $3 \cdot \frac{3}{4}$

A) $\frac{9}{4}$ B) $\frac{3}{20}$ C) $\frac{1}{4}$ D) $\frac{21}{22}$

Answer: A

27) $2 \cdot 1\frac{1}{3}$

A) $\frac{1}{9}$ B) $\frac{16}{11}$ C) $\frac{2}{3}$ D) $\frac{8}{3}$

Answer: D

28) $2 \cdot 1\frac{1}{3}$

A) $\frac{15}{11}$ B) $\frac{2}{21}$ C) $\frac{8}{3}$ D) $\frac{10}{3}$

Answer: C

29) $2\frac{7}{9} \cdot 3\frac{5}{19}$

A) $\frac{1550}{171}$ B) $\frac{137}{46}$ C) $\frac{558}{475}$ D) $\frac{25}{171}$

Answer: A

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Divide as indicated. Write the answer as a fraction in lowest terms.

30) $\frac{4}{9} \div \frac{1}{6}$

A) $\frac{2}{27}$ B) $\frac{4}{9}$ C) $\frac{8}{3}$ D) $\frac{1}{3}$

Answer: C

31) $\frac{3}{10} \div \frac{4}{11}$

A) $\frac{1}{3}$ B) $\frac{3}{40}$ C) $\frac{6}{55}$ D) $\frac{33}{40}$

Answer: D

32) $\frac{8}{9} \div 2\frac{5}{6}$

A) $\frac{16}{51}$ B) $\frac{11}{8}$ C) $\frac{8}{153}$ D) $\frac{68}{27}$

Answer: A

33) $1\frac{1}{13} \div 1\frac{5}{13}$

A) $\frac{252}{169}$ B) $\frac{7}{117}$ C) $\frac{16}{13}$ D) $\frac{7}{9}$

Answer: D

34) $2\frac{2}{3} \div 5\frac{1}{3}$

A) $\frac{1}{2}$ B) $\frac{1}{6}$ C) $\frac{32}{9}$ D) $\frac{128}{9}$

Answer: A

35) $2\frac{3}{43} \div 6$

A) $\frac{89}{3354}$ B) $\frac{534}{43}$ C) $\frac{167}{56}$ D) $\frac{89}{258}$

Answer: D

Add as indicated. Write the answer as a fraction in lowest terms.

36) $\frac{2}{7} + \frac{4}{7}$

A) $\frac{8}{7}$ B) $\frac{6}{7}$ C) $\frac{2}{7}$ D) $\frac{3}{7}$

Answer: B

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37) $\frac{4}{11} + \frac{2}{11}$

A) $\frac{8}{11}$ B) $\frac{2}{11}$ C) $\frac{3}{11}$ D) $\frac{6}{11}$

Answer: D

38) $\frac{2}{5} + \frac{3}{4}$

A) $\frac{5}{9}$ B) $\frac{23}{9}$ C) $\frac{23}{20}$ D) $\frac{1}{4}$

Answer: C

39) $\frac{10}{13} + \frac{6}{7}$

A) $\frac{4}{5}$ B) $\frac{16}{91}$ C) $\frac{37}{5}$ D) $\frac{148}{91}$

Answer: D

40) $\frac{1}{6} + \frac{5}{81}$

A) $\frac{7}{1944}$ B) $\frac{7}{93}$ C) $\frac{37}{162}$ D) $\frac{148}{31}$

Answer: C

41) $2\frac{1}{3} + 1\frac{1}{4}$

A) $\frac{43}{7}$ B) $\frac{43}{12}$ C) $\frac{12}{7}$ D) 1

Answer: B

42) $40\frac{1}{2} + 9\frac{2}{9}$

A) $\frac{82}{9}$ B) $\frac{164}{11}$ C) $\frac{895}{11}$ D) $\frac{895}{18}$

Answer: D

43) $3\frac{10}{17} + 1\frac{3}{16}$

A) $\frac{80}{33}$ B) $\frac{433}{11}$ C) $\frac{1299}{272}$ D) $\frac{5}{17}$

Answer: C

44) $\frac{1}{15} + \frac{1}{5}$

A) $\frac{1}{20}$ B) $\frac{2}{15}$ C) $\frac{4}{15}$ D) $\frac{1}{10}$

Answer: C

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Subtract as indicated. Write the answer as a fraction in lowest terms.

45) $\frac{7}{5} - \frac{6}{5}$

A) $\frac{1}{5}$ B) $\frac{13}{5}$ C) $\frac{42}{5}$ D) $\frac{1}{10}$

Answer: A

46) $\frac{9}{26} - \frac{4}{26}$

A) $\frac{1}{2}$ B) $\frac{18}{13}$ C) $\frac{5}{26}$ D) $\frac{5}{52}$

Answer: C

47) $\frac{3}{4} - \frac{1}{3}$

A) $\frac{12}{5}$ B) $\frac{1}{12}$ C) $\frac{5}{12}$ D) $\frac{5}{2}$

Answer: C

48) $\frac{5}{8} - \frac{1}{4}$

A) $\frac{8}{3}$ B) 6 C) $\frac{1}{128}$ D) $\frac{3}{8}$

Answer: D

49) $\frac{12}{19} - \frac{11}{25}$

A) $\frac{91}{19}$ B) $\frac{1}{475}$ C) $\frac{475}{91}$ D) $\frac{91}{475}$

Answer: D

50) $8\frac{2}{3} - 2\frac{1}{2}$

A) $\frac{148}{3}$ B) $\frac{37}{6}$ C) $\frac{1}{4}$ D) $\frac{6}{37}$

Answer: B

51) $19\frac{1}{2} - 12\frac{7}{9}$

A) $\frac{121}{2}$ B) $\frac{121}{18}$ C) $\frac{1}{27}$ D) $\frac{18}{121}$

Answer: B

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52) $\frac{11}{12} - \frac{1}{15}$

A) $\frac{17}{20}$ B) $\frac{10}{3}$ C) $\frac{59}{60}$ D) 0

Answer: A

Solve the problem.

53) Ellen is knitting a scarf with one $6\frac{1}{2}$ –inch blue stripe, one $6\frac{1}{3}$ –inch green stripe, and one $3\frac{1}{3}$ –inch white stripe. How wide is the scarf?

A) $\frac{6}{97}$ in. B) $16\frac{1}{6}$ in. C) $5\frac{1}{4}$ in. D) $\frac{4}{21}$ in.

Answer: B

54) While shopping for a party, June bought $2\frac{4}{5}$ pounds of hamburger, $5\frac{1}{2}$ pounds of chicken, and $2\frac{1}{6}$ pounds of ham. How much meat did she buy?

A) $\frac{15}{157}$ lb B) $\frac{13}{38}$ lb C) $10\frac{7}{15}$ lb D) $2\frac{12}{13}$ lb

Answer: C

55) To obtain a certain shade of paint, Peter mixed 4 gallons of white paint with $8\frac{1}{2}$ gallons of brown and $1\frac{1}{2}$ gallons of blue paint. How much paint did he have?

A) $\frac{13}{41}$ gal B) 14 gal C) $3\frac{2}{13}$ gal D) $\frac{1}{14}$ gal

Answer: B

56) If John puts $\frac{3}{4}$ lb of roast beef on each sandwich, how many sandwiches can he make from $3\frac{3}{4}$ lb of roast beef?

A) 3 sandwiches B) 15 sandwiches C) 4 sandwiches D) 5 sandwiches

Answer: D

57) Anne writes one page in $\frac{1}{2}$ of an hour. How many pages can she write in $2\frac{1}{2}$ hours?

A) 5 page(s) B) 7 page(s) C) 1 page(s) D) 2 page(s)

Answer: A

58) A sawmill trims rough cut boards to look smooth. When a board is rough cut, it is 4 inches wide. When it is trimmed, it is $3\frac{13}{16}$ inches wide. How much width was trimmed off?

A) $4\frac{3}{16}$ inches B) $\frac{61}{16}$ inches C) $\frac{3}{16}$ inch D) $\frac{13}{16}$ inch

Answer: C

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59)

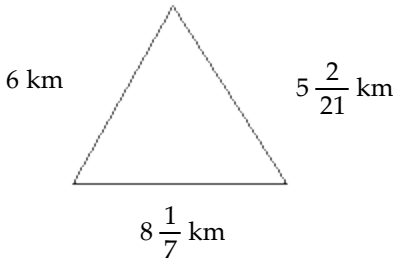
	MICROWAVE	STOVE TOP		
Servings	2	2	3	5
Milk	$2\frac{1}{4}$ cup	2 cups	4 cups	5 cups
Oatmeal	5 Tbsp	4 Tbsp	1 cup	2 cups
Butter	1 pat	1 pat	$\frac{1}{4}$ Tbsp	$\frac{1}{2}$ Tbsp

Using the chart above, (I) how many cups of milk would be needed for 4 microwave servings? (II) How many tablespoons of butter would be needed for 4 stove top servings?

A) $1\frac{5}{8}$ cups; $\frac{3}{4}$ Tbsp B) $1\frac{1}{2}$ cups; $\frac{1}{8}$ Tbsp C) $4\frac{1}{2}$ cups; $\frac{3}{8}$ Tbsp D) 5 cups; $\frac{5}{8}$ Tbsp

Answer: C

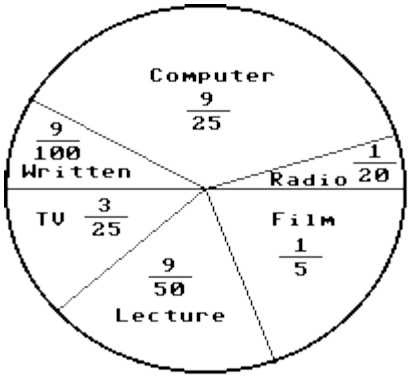
60) Find the perimeter of the triangle in the figure.



A) $19\frac{1}{7}$ ft B) $14\frac{5}{21}$ ft C) $19\frac{2}{7}$ ft D) $19\frac{5}{21}$ ft

Answer: D

61)



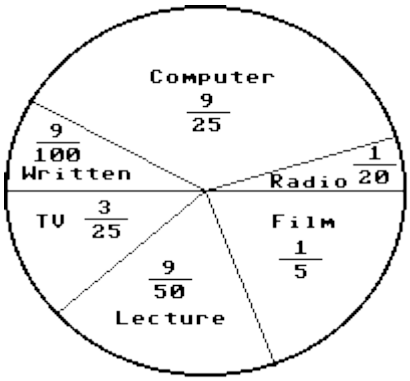
In a school survey, students showed these preferences for instructional materials.
About how many students would you expect to prefer computers in a school of 1000 students?

A) About 36 students B) About 180 students C) About 360 students D) About 200 students

Answer: C

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62)



In a school survey, students showed these preferences for instructional materials.
About how many students would you expect to prefer lectures in a school of 450 students?

A) About 18 students B) About 81 students C) About 162 students D) About 90 students

Answer: B

Write the decimal as a fraction. Do not write in lowest terms.

63) 0.652

A) $\frac{1304}{1000}$ B) $\frac{326}{1000}$ C) $\frac{1}{652}$ D) $\frac{652}{1000}$

Answer: D

64) 7.4

A) $\frac{148}{100}$ B) $\frac{74}{10}$ C) $\frac{148}{10}$ D) $\frac{1}{74}$

Answer: B

65) 2.02

A) $\frac{404}{100}$ B) $\frac{1}{202}$ C) $\frac{202}{100}$ D) $\frac{101}{100}$

Answer: C

66) 3.53

A) $\frac{1}{353}$ B) $\frac{176.5}{100}$ C) $\frac{706}{100}$ D) $\frac{353}{100}$

Answer: D

67) 0.3

A) $\frac{1}{30}$ B) $\frac{1}{3}$ C) $\frac{3}{10}$ D) $\frac{3}{100}$

Answer: C

68) 3.998

A) $\frac{3998}{100}$ B) $\frac{3998}{10}$ C) $\frac{3998}{10,000}$ D) $\frac{3998}{1000}$

Answer: D

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Add or subtract as indicated. Make sure that your answer is reasonable by estimating first.

69) 9.439 + 2.907

A) 13.346 B) 6.532 C) −6.532 D) 12.346

Answer: D

70) 4.9 + 5.35

A) 0.45 B) −0.45 C) 10.35 D) 10.25

Answer: D

71) 15 + 14.11

A) 0.89 B) −0.89 C) 29.21 D) 29.11

Answer: D

72) 4 + 3.12 + 0.601

A) 7.721 B) 1.481 C) 0.279 D) 6.519

Answer: A

73) 19.8 − 15.45

A) 4.35 B) 35.25 C) −4.35 D) 4.45

Answer: A

74) 29 − 4.34

A) −24.66 B) 24.76 C) 24.66 D) 33.34

Answer: C

75) 19.904 − 3.279

A) 16.725 B) 16.625 C) 23.183 D) −16.625

Answer: B

76) 88.459 + 27.67 + 578.957 + 402.073

A) 1097.159 B) 1346.189 C) 735.2933 D) 576.0977

Answer: A

77) 88.509 + 187.528 + 5.949

A) 202.3279 B) 335.527 C) 113.2108 D) 281.986

Answer: D

Multiply or divide as indicated. Make sure that your answer is reasonable by estimating first.

78) 3.80 × 4

A) 15 B) 15.2 C) 7.8 D) 7

Answer: B

79) 5.8 × 1.1

A) 6.38 B) 6.48 C) 6.491 D) 6.49

Answer: A

80) 124.2 × 0.33

A) 41.096 B) 40.986 C) 41.086 D) 41.097

Answer: B

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81) 17.84×0.007

A) 1.22488 B) 0.12488 C) 0.22488 D) 0.23488

Answer: B

82) $47.4 \div 5$

A) 9.48 B) 0.105 C) 94.8 D) 0.948

Answer: A

83) $54.8 \div 8.55$

A) 0.641 B) 6.409 C) 0.156 D) 64.094

Answer: B

Change the fraction to a decimal. Round as indicated.

84) $\frac{5}{6}$ hundredths

A) 0.83 B) 0.17 C) 4.15 D) 0.42

Answer: A

85) $\frac{15}{16}$ hundredths

A) 0.47 B) 0.19 C) 0.94 D) 4.70

Answer: C

86) $\frac{44}{46}$ tenths

A) 0.2 B) 0.10 C) 0.5 D) 5.0

Answer: B

87) $\frac{5}{3}$ hundredths

A) 0.84 B) 0.33 C) 1.67 D) 8.35

Answer: C

88) $1\frac{9}{19}$ tenths

A) 1.5 B) 0.8 C) 0.3 D) 7.5

Answer: A

89) $\frac{8}{9}$ three decimal places

A) 0.889 B) 0.178 C) 0.445 D) 4.445

Answer: A

90) $1\frac{6}{7}$ two decimal places

A) 9.30 B) 1.86 C) 0.37 D) 0.93

Answer: B

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Write as a decimal.

91) 96%

A) 9.6 B) 0.85 C) 0.096 D) 0.96

Answer: D

92) 39.4%

A) 3.94 B) 0.0394 C) 0.284 D) 0.394

Answer: D

93) 500%

A) 5 B) 5.01 C) 0.5 D) 50

Answer: A

94) 170%

A) 0.17 B) 1.7 C) 1.71 D) 17

Answer: B

95) 159%

A) 1.6 B) 0.159 C) 15.9 D) 1.59

Answer: D

96) 32.47%

A) 3.247 B) 0.3247 C) 0.3147 D) 0.03247

Answer: B

97) 0.95%

A) 0.095 B) 0.0105 C) 0.95 D) 0.0095

Answer: D

98) 79.8%

A) 0.00798 B) 7.98 C) 0.0798 D) 0.798

Answer: D

99) $5\frac{1}{7}\%$

A) 0.5143 B) 5.0014 C) 5.1429 D) 0.0514

Answer: D

100) $9\frac{4}{11}\%$

A) 9.3636 B) 0.9364 C) 0.0936 D) 9.0036

Answer: C

Write as a percent.

101) 0.85

A) 850% B) 8.5% C) 0.085% D) 85%

Answer: D

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102) 0.8

A) 800% B) 0.08% C) 0.8% D) 80%

Answer: D

103) 0.019

A) 0.019% B) 0.0019% C) 1.9% D) 19%

Answer: C

104) 0.265

A) 265% B) 0.0265% C) 0.265% D) 26.5%

Answer: D

105) 2.2

A) 0.22% B) 0.0022% C) 22% D) 220%

Answer: D

106) 0.00895

A) 0.4475% B) 0.0895% C) 0.895% D) 0.000895%

Answer: C

107) 4

A) 400% B) 200% C) 0.4% D) 0.04%

Answer: A

Write the percent as a fraction in lowest terms.

108) 60%

A) $\frac{3}{5}$ B) $\frac{6}{5}$ C) 6 D) $\frac{3}{10}$

Answer: A

109) $\frac{4}{5}$%

A) $\frac{2}{125}$ B) $\frac{1}{125}$ C) $\frac{1}{250}$ D) $\frac{2}{25}$

Answer: B

110) 0.8%

A) $\frac{1}{250}$ B) $\frac{2}{25}$ C) $\frac{2}{125}$ D) $\frac{1}{125}$

Answer: D

111) 600%

A) 60 B) 6 C) 600 D) 6000

Answer: B

112) 6.35%

A) $\frac{127}{200}$ B) $\frac{127}{2000}$ C) $\frac{127}{2}$ D) $\frac{127}{20}$

Answer: B

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Write the fraction as a percent. Round to the nearest tenth of a percent if necessary.

113) $\frac{1}{3}$

A) 30% B) 33.3% C) 3.3% D) 111%

Answer: B

114) $\frac{4}{10}$

A) 4% B) 0.4% C) 40% D) 400%

Answer: C

115) $\frac{96}{100}$

A) 960% B) 96% C) 0.96% D) 9.6%

Answer: B

116) $\frac{11}{50}$

A) 1000% B) 2.2% C) 22% D) 11%

Answer: C

117) $\frac{2}{3}$

A) 66.7% B) 55.6% C) 6.7% D) 120%

Answer: A

118) $\frac{11}{24}$

A) 240% B) 45.8% C) 4.6% D) 19.1%

Answer: B

119) $\frac{10}{9}$

A) 123.4% B) 111.1% C) 90% D) 11.1%

Answer: B

Use set notation, and list all the elements of the set.

120) {12, 13, 14, . . . , 18}

A) {12, 13, 15, 17, 18} B) {12, 13, 14, 15, 16, 17, 18}

C) {12, 14, 16, 18} D) {12, 13, 14, 15, 16, 17, 18, 19}

Answer: B

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121) $\left\{1, \frac{1}{4}, \frac{1}{16}, \ldots, \frac{1}{1024}\right\}$

A) $\left\{1, \frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \frac{1}{1024}\right\}$

B) $\left\{1, \frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \frac{1}{4096}, \frac{1}{262{,}144}\right\}$

C) $\left\{1, \frac{1}{4}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}\right\}$

D) $\left\{1, \frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \frac{1}{256}, \frac{1}{1024}\right\}$

Answer: D

122) {11, 17, 23, . . ., 53}

A) {11, 17, 23, 30, 36, 42, 48, 54}

B) {11, 17, 22, 28, 34, 40, 46, 52}

C) {11, 17, 23, 29, 35, 41, 47, 53}

D) {11, 17, 23, 29, 35}

Answer: C

123) {81, 79, 77, . . ., 61}

A) {81, 79, 77, 73, 69, 65, 61}

B) {81, 79, 77, 74, 72, 70, 68, 66, 64, 62, 60}

C) {81, 79, 77, 75, 73, 71, 69, 67, 65, 63, 61}

D) {81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101}

Answer: C

124) The first two natural numbers.

A) {0, 1, 2}

B) {0, 2}

C) {0, 1}

D) {1, 2}

Answer: D

125) The natural numbers between 3 and 5.

A) {0, 1, 2, 3}

B) {4}

C) {3, 5}

D) {3, 4, 5}

Answer: B

Identify the set as finite or infinite.

126) {4, 12, 20, . . ., 44}

A) finite

B) infinite

Answer: A

127) {3, 8, 13, . . .}

A) finite

B) infinite

Answer: B

128) $\left\{1, \frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \ldots, \right\}$

A) infinite

B) finite

Answer: A

129) {x | x is a natural number larger than 4}

A) finite

B) infinite

Answer: B

130) {x | x is a fraction between 0 and 1}

A) infinite

B) finite

Answer: A

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131) {x | x is an even natural number}
A) infinite B) finite
Answer: A

132) {x | x is a person alive now}
A) infinite B) finite
Answer: B

Insert ∈ or ∉ in the blank to make the statement is true.

133) 5 ____ {2, 3, 4, 5}
A) ∈ B) ∉
Answer: A

134) 10 ____ {6, 9, 12, 10, 8}
A) ∉ B) ∈
Answer: B

135) –3 ____ {3, 5, 7, 9}
A) ∉ B) ∈
Answer: A

136) 0 ____ {3, 5, 0, 7, 6}
A) ∈ B) ∉
Answer: A

137) 0 ____ {5, 6, 7, 8, 9, 10}
A) ∈ B) ∉
Answer: B

138) {8} ____ {8, 9, 10, 11, 12, 13}
A) ∉ B) ∈
Answer: A

139) {6} ____ {4, 6, 8, 10}
A) ∉ B) ∈
Answer: A

140) {0} ____ {0, 8, 9, 10, 11}
A) ∉ B) ∈
Answer: A

141) 1 ____ ∅
A) ∈ B) ∉
Answer: B

142) ∅ ____ ∅
A) ∉ B) ∈
Answer: A

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Tell whether the statement is true or false.

143) $4 \in \{2, 32, 4, 5\}$

A) True B) False

Answer: A

144) $6 \in \{-2, 7, 8, 11\}$

A) True B) False

Answer: B

145) $8 \notin \{0, 6, 7, 9, 11\}$

A) True B) False

Answer: A

146) $\{0, 3, 6, 11\} = \{6, 3, 11, 0\}$

A) True B) False

Answer: A

147) $\{9, 14, 12, 15\} = \{12, 9, 14\}$

A) True B) False

Answer: B

148) $\{x \mid x \text{ is a natural number greater than } 9\} = \{9, 10, 11, \ldots\}$

A) True B) False

Answer: B

149) Let A = {8, 9, 10, 11, 12, 13}, B = {10, 12, 14}, C = {8, 9, 11, 13}, D = {8, 13}, and U = {8, 9, 10, 11, 12, 13, 14}.

$A \subseteq U$

A) True B) False

Answer: A

150) Let A = {2, 3, 4, 5, 6, 7}, B = {4, 6, 8}, C = {2, 3, 5, 7}, D = {2, 7}, and U = {2, 3, 4, 5, 6, 7, 8}.

$A \subseteq B$

A) True B) False

Answer: B

151) Let A = {5, 6, 7, 8, 9, 10}, B = {7, 9, 11}, C = {5, 6, 8, 10}, D = {5, 10}, and U = {5, 6, 7, 8, 9, 10, 11}.

$C \subseteq A$

A) True B) False

Answer: A

152) Let A = {5, 6, 7, 8, 9, 10}, B = {7, 9, 11}, C = {5, 6, 8, 10}, D = {5, 10}, and U = {5, 6, 7, 8, 9, 10, 11}.

$\varnothing \subseteq D$

A) True B) False

Answer: A

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153) Let A = {9, 10, 11, 12, 13, 14}, B = {11, 13, 15}, C = {9, 10, 12, 14}, D = {9, 14}, and U = {9, 10, 11, 12, 13, 14, 15}.

$C \subseteq \varnothing$

A) True B) False

Answer: B

154) Let A = {9, 10, 11, 12, 13, 14}, B = {11, 13, 15}, C = {9, 10, 12, 14}, D = {9, 14}, and U = {9, 10, 11, 12, 13, 14, 15}.

$\{13, 15\} \subseteq B$

A) True B) False

Answer: A

155) Let A = {4, 5, 6, 7, 8, 9}, B = {6, 8, 10}, C = {4, 5, 7, 9}, D = {4, 9}, and U = {4, 5, 6, 7, 8, 9, 10}.

$\{0, 5, 9\} \subseteq C$

A) True B) False

Answer: B

156) Let A = {4, 5, 6, 7, 8, 9}, B = {6, 8, 10}, C = {4, 5, 7, 9}, D = {4, 9}, and U = {4, 5, 6, 7, 8, 9, 10}.

$B \not\subseteq C$

A) True B) False

Answer: A

157) Let A = {7, 8, 9, 10, 11, 12}, B = {9, 11, 13}, C = {7, 8, 10, 12}, D = {7, 12}, and U = {7, 8, 9, 10, 11, 12, 13}.

$D \not\subseteq C$

A) True B) False

Answer: B

158) Let A = {9, 10, 11, 12, 13, 14}, B = {11, 13, 15}, C = {9, 10, 12, 14}, D = {10, 14}, and U = {9, 10, 11, 12, 13, 14, 15}.

$U \subseteq C$

A) True B) False

Answer: B

Insert $\subseteq$ or $\not\subseteq$ in the blank to make the statement true.

159) {6, 7, 8} ____ {0, 6, 7, 8, 9, 10}

A) $\subseteq$ B) $\not\subseteq$

Answer: A

160) {5, 9} ____ {2, –3, 7, –5, 9, 4}

A) $\not\subseteq$ B) $\subseteq$

Answer: A

161) {3, 5, 8, 10} ____ {3, 3, 5, 6, 7, 8}

A) $\not\subseteq$ B) $\subseteq$

Answer: A

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162) {6, 7, 8, 11} ____ {6, 10, 8, 9, 7, 11}

A) ⊆ B) ⊈

Answer: A

163) {0, 3, 5, 8} ____ {3, 5, 8, 9, 10, 11}

A) ⊈ B) ⊆

Answer: A

164) ∅ ____ {9, 12, 16, 0, 13, 17}

A) ⊈ B) ⊆

Answer: B

165) {–8, 3, –9, 0, 7} ____ ∅

A) ⊈ B) ⊆

Answer: A

166) ∅ ____ ∅

A) ⊈ B) ⊆

Answer: B

Tell whether the statement is true or false.

167) {7, 10, 11, 13} ∩ {10, 11, 14, 15} = {10, 11}

A) True B) False

Answer: A

168) {9, 11, 12, 14} ∪ {0, 13, 11, 16, 9} = {9, 11}

A) True B) False

Answer: B

169) {1, 3, 4, 6} ∩ ∅ = {1, 3, 4, 6}

A) True B) False

Answer: B

170) {2, 4, 5, 7} ∪ ∅ = {2, 4, 5, 7}

A) True B) False

Answer: A

Use these sets to find the following. Identify any disjoint sets.

171) Let U = {8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18}, M = {8, 10, 12, 14}, N = {9, 11, 13, 15, 17}, Q = {8, 10, 12, 14, 16, 18}, and R = {8, 9, 10, 11}.

M ∩ R

A) {8, 10} B) {8, 9, 10, 11}

C) ∅; M and R are disjoint sets. D) {8, 9, 10, 11, 12, 14}

Answer: A

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172) Let U = {8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18}, M = {8, 10, 12, 14}, N = {9, 11, 13, 15, 17}, Q = {8, 10, 12, 14, 16, 18}, and R = {8, 9, 10, 11}.

M ∪ N

A) {8, 9, 10, 11, 12, 13, 14, 15, 17}
B) ∅; M and N are disjoint sets.
C) {9, 10, 11, 12, 13, 14, 15, 16, 17}
D) {8, 9, 10, 11, 12, 13, 17}

Answer: A

173) Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}, M = {1, 3, 5, 7}, N = {2, 4, 6, 8, 10}, Q = {1, 3, 5, 7, 9, 11}, and R = {1, 2, 3, 4}.

M ∩ N

A) {2, 3, 4, 5, 6, 7, 8, 9, 10}
B) {1, 2, 3, 4, 5, 6, 7, 8, 10}
C) ∅; M and N are disjoint sets.
D) {3, 4, 5, 6, 10}

Answer: C

174) Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}, M = {1, 3, 5, 7}, N = {2, 4, 6, 8, 10}, Q = {1, 3, 5, 7, 9, 11}, and R = {1, 2, 3, 4}.

N'

A) Q, or {1, 3, 5, 7, 9, 11}
B) {3, 5, 7, 9, 11}
C) M, or {1, 3, 5, 7}
D) {2, 4, 6, 8, 10}

Answer: A

175) Let U = {5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}, M = {5, 7, 9, 11}, N = {6, 8, 10, 12, 14}, Q = {5, 7, 9, 11, 13, 15}, and R = {5, 6, 7, 8}.

Q ∩R'

A) ∅; Q and R' are disjoint sets.
B) {9, 11, 13, 15}
C) {8, 9, 10, 11, 12, 13, 14, 15}
D) {7, 9, 11, 13, 15}

Answer: B

176) Let U = {9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19}, M = {9, 11, 13, 15}, N = {10, 12, 14, 16, 18}, Q = {9, 11, 13, 15, 17, 19}, and R = {9, 10, 11, 12}.

∅ ∪ N

A) N, or {10, 12, 14, 16, 18}; N and ∅ are disjoint sets.
B) {11, 13, 15, 17, 19}
C) ∅; N and ∅ are disjoint sets.
D) {9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19}

Answer: A

177) Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}, M = {1, 3, 5, 7}, N = {2, 4, 6, 8, 10}, Q = {1, 3, 5, 7, 9, 11}, and R = {1, 2, 3, 4}.

(N ∪ R) ∩ Q

A) {3}
B) {1}
C) {1, 3}
D) ∅; N and R are disjoint sets.

Answer: C

178) Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11}, M = {1, 3, 5, 7}, N = {2, 4, 6, 8, 10}, Q = {1, 3, 5, 7, 9, 11}, and R = {1, 2, 3, 4}.

Q' ∩ (N' ∩ U)

A) {1, 3, 5, 7, 9, 11}
B) ∅; Q' and (N' ∩ U) are disjoint sets.
C) {2, 4, 6, 8, 10}
D) {2, 3, 4, 5, 6, 7}

Answer: B

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179) Let U = {4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14}, M = {4, 6, 8, 10}, N = {5, 7, 9, 11, 13}, Q = {4, 6, 8, 10, 12, 14}, and R = {4, 5, 6, 7}.

$(R \cup N) \cap M'$

A) {4, 5, 7, 9, 11, 13}
B) M, or {4, 6, 8, 10}
C) ∅; M' and (R ∪ N) are disjoint sets.
D) N, or {5, 7, 9, 11, 13}

Answer: D

180) Let U = {9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19}, M = {9, 11, 13, 15}, N = {10, 12, 14, 16, 18}, Q = {9, 11, 13, 15, 17, 19}, and R = {9, 10, 11, 12}.

$(U \cup \varnothing) \cap R'$

A) ∅; R' and (U ∪ ∅) are disjoint sets.
B) {13, 14, 15, 16, 17, 18, 19}
C) U, or {9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19}
D) R, or {9, 10, 11, 12}

Answer: B

List all the elements of set B that belong to the indicated set.

181) $B = \left\{18, \sqrt{6}, -7, 0, \frac{0}{2}, \sqrt{9}\right\}$

Integers

A) $18, 0, \sqrt{9}$
B) 18, 0
C) $18, -7, 0, \frac{0}{2}, \sqrt{9}$
D) 18, –7, 0

Answer: C

182) $B = \left\{8, \sqrt{6}, -21, 0, \frac{0}{6}, \sqrt{9}\right\}$

Whole numbers

A) 8, 0
B) $8, -21, 0, \sqrt{9}$
C) $8, 0, \frac{0}{6}, \sqrt{9}$
D) 8, –21, 0

Answer: C

183) $B = \left\{8, \sqrt{8}, -23, 0, \frac{0}{25}, \sqrt{25}\right\}$

Natural numbers

A) 8, 0
B) $8, \sqrt{25}$
C) $8, 0, \frac{0}{4}$
D) $8, 0, \sqrt{25}$

Answer: B

184) $B = \left\{19, \sqrt{7}, -7, 0, \frac{0}{5}, \sqrt{9}, \frac{-2}{0}, 0.2\right\}$

Rational numbers

A) $19, 0, \sqrt{9}$
B) $\sqrt{7}, \sqrt{9}$
C) $\sqrt{7}, \frac{0}{5}, 0.2$
D) $19, -7, 0, \frac{0}{5}, \sqrt{9}, 0.2$

Answer: D

Decide whether the statement is true or false. If false, correct the statement so it is true.

185) $|6 - 12| = |6| - |12|$

A) True
B) False; $|6 - 12| = |12| - |6|$

Answer: B

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186) $|4 - 10| = |10| - |4|$

A) True

B) False; $|4 - 10| = |4| - |10|$

Answer: A

187) $|-12| = -|12|$

A) True

B) False; $|-12| = -(-12) = 12$

Answer: B

188) $|-8| = |8|$

A) True

B) False; $|-8| = -|8| = -8$

Answer: A

189) $|(-4)^3| = -|(4)^3|$

A) True

B) False; $|(-4)^3| = 4^3$

Answer: B

190) $\frac{|-4|}{|5|} = \left|\frac{-4}{5}\right|$

A) True

B) False; $\frac{|-4|}{|5|} = \left|\frac{4}{-5}\right|$

Answer: A

191) $|-5 \cdot 9| = |-5| \cdot |9|$

A) True

B) False; $|-5 \cdot 9| = -|5| \cdot |9|$

Answer: A

Evaluate the expression.

192) $|-15|$

A) 15 B) −15 C) 0 D) ±15

Answer: A

193) $|25|$

A) ±25 B) 0 C) −25 D) 25

Answer: D

194) $-|12|$

A) ±12 B) 0 C) −12 D) 12

Answer: C

195) $-|-18|$

A) −18 B) ±18 C) 0 D) 18

Answer: A

196) $-\left|\frac{1}{7}\right|$

A) 0 B) $\frac{1}{7}$ C) $\pm\frac{1}{7}$ D) $-\frac{1}{7}$

Answer: D

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197) $-\left|-\frac{10}{3}\right|$

A) $\frac{10}{3}$ B) $\pm\frac{10}{3}$ C) 0 D) $-\frac{10}{3}$

Answer: D

198) $\left|-\frac{4}{9}\right|$

A) $-\frac{4}{9}$ B) $\pm\frac{4}{9}$ C) 0 D) $\frac{4}{9}$

Answer: D

199) Let $x = -11$, $y = -16$. Evaluate $|8x|$.

A) 176 B) −88 C) −176 D) 88

Answer: D

200) Let $x = -5$, $y = 2$. Evaluate $|x + y|$.

A) 3 B) −3 C) −7 D) 7

Answer: A

201) Let $x = -3$, $y = 2$. Evaluate $|x| + |y|$.

A) −1 B) 1 C) −5 D) 5

Answer: D

202) Let $x = 8$, $y = -25$. Evaluate $|y - x|$.

A) −17 B) 17 C) 33 D) −33

Answer: C

203) Let $x = 5$, $y = 9$. Evaluate $|6x - 7y|$.

A) 33 B) −93 C) 93 D) −33

Answer: A

204) Let $x = -15$, $y = 20$. Evaluate $|5y - 6x|$.

A) −10 B) 190 C) −190 D) 10

Answer: B

205) Let $x = 6$, $y = -3$. Evaluate $4|x| + 5|y|$.

A) 39 B) 9 C) −9 D) −39

Answer: A

206) Let $x = 22$, $y = 11$.
Evaluate $|-8y + 4x| - |2y|$.

A) 242 B) 198 C) −22 D) 110

Answer: C

207) Let $x = 3$ and $y = -5$. Evaluate $\frac{|x|}{x} + \frac{|y|}{y}$.

A) 0 B) −1 C) 2 D) 1

Answer: A

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208) Let $x = 4$, $y = 2$. Evaluate $\frac{|x + 1| - |4y|}{|3y - 5x|}$.

A) $-\frac{3}{2}$ B) $\frac{13}{14}$ C) $-\frac{3}{14}$ D) $-\frac{3}{26}$

Answer: C

Determine which property of absolute value justifies the statement.

209) $|x| \geq 0$

A) Property 1: the absolute value of a number is positive or 0.
B) Property 1: the absolute value of a number is greater than 0.
C) Property 5: the triangle inequality
D) Property 1: the absolute value of a number is positive.

Answer: A

210) $|-x| = |x|$

A) Property 5: the triangle inequality
B) Property 2: the absolute value of a number and its opposite are equal.
C) Property 2: the opposite of the absolute value of a number is equal to the absolute value of the number.
D) Property 1: the opposite of a number is equal to the absolute value of the number .

Answer: B

211) $|x + y| \leq |x| + |y|$

A) Property 5: the absolute value of the sum of two numbers is less than or equal to the sum of their absolute values (the triangle inequality).
B) Property 4: the sum of two numbers is less than or equal to the absolute value of the sum of the numbers.
C) Property 5: the sum of the absolute values of two numbers is less than or equal to the absolute value of their sum (the triangle inequality).
D) Property 4: the absolute value of the sum of the numbers is less than or equal to the sum of the two numbers.

Answer: A

Find the distance between two points given their coordinates.

212) Find the distance between points P and Q on a number line, with coordinates 5 and 12, respectively.

A) d(P, Q) = 7 B) d(P, Q) = –17 C) d(P, Q) = 17 D) d(P, Q) = –7

Answer: A

213) Find the distance between points R and S on a number line, with coordinates –3 and 10, respectively.

A) d(R, S) = –7 B) d(R, S) = –13 C) d(R, S) = 7 D) d(R, S) = 13

Answer: D

214) Find the distance between points P and Q on a number line, with coordinates –4 and 2, respectively.

A) d(P, Q) = –2 B) d(P, Q) = –6 C) d(P, Q) = 2 D) d(P, Q) = 6

Answer: D

215) Find the distance between points R and S on a number line, with coordinates 7 and –4, respectively.

A) d(R, S) = –3 B) d(R, S) = –11 C) d(R, S) = 3 D) d(R, S) = 11

Answer: D

216) Find the distance between points P and Q on a number line, with coordinates 4 and –7, respectively.

A) d(P, Q) = –3 B) d(P, Q) = 11 C) d(P, Q) = 3 D) d(P, Q) = –11

Answer: B

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217) Find the distance between points R and S on a number line, with coordinates –2 and –4, respectively.
A) d(R, S) = 2 B) d(R, S) = –6 C) d(R, S) = 6 D) d(R, S) = –2
Answer: A

Add or subtract as indicated.

218) 8 + (–3)
A) –5 B) 11 C) –11 D) 5
Answer: D

219) –4 + 20
A) –16 B) –24 C) 16 D) 24
Answer: C

220) –27 + (–9)
A) –36 B) 36 C) –18 D) 18
Answer: A

221) –69 + 41
A) 28 B) –28 C) 110 D) –110
Answer: B

222) –12 + 26
A) 14 B) –38 C) 38 D) –14
Answer: A

223) –11 – 18
A) 29 B) –7 C) –29 D) 7
Answer: C

224) 68 – (–15)
A) 53 B) 83 C) –53 D) –83
Answer: B

225) 9 – (–28)
A) 37 B) –19 C) 19 D) –37
Answer: A

226) –17 – (–25)
A) –42 B) –8 C) 8 D) 42
Answer: C

227) 10 – (–4)
A) 14 B) –14 C) 6 D) –6
Answer: A

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Perform the indicated operation.

228) $\left(\frac{3}{5}\right)+\left(-\frac{4}{15}\right)$

A) $\frac{7}{75}$ B) $\frac{1}{3}$ C) $-\frac{7}{15}$ D) $-\frac{1}{3}$

Answer: B

229) $\left(\frac{5}{6}\right)+\left(-\frac{3}{5}\right)$

A) $\frac{2}{5}$ B) $\frac{1}{15}$ C) $\frac{7}{30}$ D) $-\frac{7}{30}$

Answer: C

230) $\left(\frac{1}{2}\right)-\left(-\frac{1}{8}\right)$

A) $\frac{1}{8}$ B) $-\frac{1}{4}$ C) $\frac{5}{8}$ D) $-\frac{5}{8}$

Answer: C

231) $\left(\frac{4}{9}\right)-\left(\frac{8}{81}\right)$

A) $-\frac{28}{81}$ B) $\frac{28}{81}$ C) $\frac{4}{27}$ D) $\frac{4}{243}$

Answer: B

232) (0.20) − (−0.85)

A) −0.17 B) 0.75 C) 0.65 D) 1.05

Answer: D

233) 0.93 − (−0.05)

A) 1.08 B) 0.88 C) 0.0465 D) 0.98

Answer: D

234) (−2.3) + (−0.7)

A) −1.6 B) 1.61 C) 1.6 D) −3

Answer: D

235) 0.84 + (−3.290)

A) −2.45 B) 2.764 C) −4.13 D) −4.03

Answer: A

236) 7.296 + (−4.062)

A) 3.234 B) −11.258 C) −11.358 D) 29.636

Answer: A

237) −7.77 + (−3.54)

A) 27.506 B) −11.31 C) 11.31 D) 4.23

Answer: B

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238) 2.586 – (–0.22)
A) 2.806 B) 2.906 C) 2.366 D) 0.569
Answer: A

Add or subtract as indicated.

239) |–16 – 12|
A) 4 B) –4 C) –28 D) 28
Answer: D

240) |14 + 13|
A) 1 B) 27 C) –27 D) –1
Answer: B

241) |18| – |16|
A) 34 B) –34 C) 2 D) –2
Answer: C

242) |19| + |14|
A) –5 B) 5 C) –33 D) 33
Answer: D

243) –|8| + |6|
A) 14 B) 2 C) –14 D) –2
Answer: D

244) |–8 – 3|
A) 11 B) 5 C) –5 D) –11
Answer: A

245) |9 + 1|
A) –10 B) 8 C) –8 D) 10
Answer: D

246) 4 – |–10|
A) –14 B) 14 C) –6 D) 6
Answer: C

247) |10| + |3|
A) 13 B) –13 C) 7 D) –7
Answer: A

Perform the indicated operation.

248) –7(–3)
A) –21 B) 21 C) 31 D) 11
Answer: B

249) 8(–8)
A) –64 B) 74 C) 64 D) –74
Answer: A

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250) $\frac{-110}{-5}$

A) $\frac{1}{22}$ B) 22 C) 12 D) –22

Answer: B

251) $\frac{20}{0}$

A) 0 B) 1 C) Undefined D) 20

Answer: C

252) $\frac{-84}{7}$

A) $\frac{1}{12}$ B) 12 C) –12 D) $-\frac{1}{12}$

Answer: C

253) $\frac{84}{-4}$

A) $\frac{1}{21}$ B) 21 C) $-\frac{1}{21}$ D) –21

Answer: D

254) $\frac{0}{8}$

A) 8 B) 0 C) Undefined D) –8

Answer: B

255) $15\left(-\frac{25}{6}\right)$

A) $\frac{2}{125}$ B) $-\frac{2}{125}$ C) $\frac{125}{2}$ D) $-\frac{125}{2}$

Answer: D

256) $-15\left(-\frac{25}{21}\right)$

A) $-\frac{7}{125}$ B) $\frac{7}{125}$ C) $-\frac{125}{7}$ D) $\frac{125}{7}$

Answer: D

257) $\frac{4}{45}(-10)$

A) $-\frac{9}{8}$ B) $-\frac{8}{9}$ C) $\frac{8}{9}$ D) $\frac{9}{8}$

Answer: B

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258) $\frac{1}{8}\left(-\frac{11}{5}\right)$

A) $\frac{93}{40}$ B) $\frac{11}{40}$ C) $-\frac{93}{40}$ D) $-\frac{11}{40}$

Answer: D

259) $-\frac{2}{5}\left(-\frac{7}{16}\right)$

A) $-\frac{67}{80}$ B) $-\frac{7}{40}$ C) $\frac{67}{80}$ D) $\frac{7}{40}$

Answer: D

260) $-\frac{1}{7}\left(\frac{1}{9}\right)\left(-\frac{5}{11}\right)$

A) $\frac{1}{378}$ B) $\frac{5}{693}$ C) $-\frac{5}{693}$ D) $-\frac{1}{378}$

Answer: B

261) $6 \div \left(-\frac{21}{4}\right)$

A) $-\frac{7}{8}$ B) $-\frac{8}{7}$ C) $\frac{8}{7}$ D) $\frac{7}{8}$

Answer: B

262) $-\frac{2}{3} \div \left(-\frac{7}{12}\right)$

A) $-\frac{7}{8}$ B) $\frac{7}{18}$ C) $-\frac{8}{7}$ D) $\frac{8}{7}$

Answer: D

263) $\frac{-\frac{25}{21}}{\frac{1}{35}}$

A) $\frac{125}{3}$ B) $-\frac{3}{125}$ C) $-\frac{125}{3}$ D) $\frac{3}{125}$

Answer: C

Evaluate the expression.

264) 4^3

A) 12 B) 144 C) 64 D) 6.4

Answer: C

265) -2^4

A) −8 B) 16 C) −16 D) 8

Answer: C

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266) $(-3)^3$

A) 27 B) –27 C) 81 D) –9

Answer: B

267) $-4 \cdot 2^2$

A) –64 B) –16 C) 16 D) 64

Answer: B

268) $-5(-3)^3$

A) –3,375 B) 3,375 C) 135 D) –135

Answer: C

269) $19 + 9 \cdot 23 + 10$

A) 654 B) 236 C) 61 D) 924

Answer: B

270) $9 + 8^2 - (-3) \cdot 2$

A) 140 B) 67 C) 79 D) 56

Answer: C

271) $69 - 5 \cdot 13 + 24$

A) 2368 B) 28 C) 101 D) 856

Answer: B

272) $66 - 15 \cdot 4 + 56 \div (-8)$

A) –1 B) –14 C) –382 D) 197

Answer: A

273) $(-6)^3 - (-6)^2$

A) 252 B) –252 C) 180 D) –180

Answer: B

274) $(8 + (-2))[6 + (8 + 7)]$

A) 23 B) 75 C) 27 D) 126

Answer: D

275) $-5[6 + 7(4 + 1)]$

A) –329 B) –325 C) –205 D) 5

Answer: C

276) $(6 - 10^2)(-4 + \sqrt{100})$

A) –9776 B) –46 C) –564 D) –384

Answer: C

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277) $\left[-\frac{7}{27}-\left(-\frac{5}{2}\right)\right]-\left(\frac{4}{3}-\frac{1}{6}\right)$

A) $\frac{92}{27}$ B) $-\frac{106}{27}$ C) $-\frac{43}{27}$ D) $\frac{29}{27}$

Answer: D

278) $\frac{-7 \cdot 3-7-(7+6)}{-7 \cdot 7+1}$

A) $-\frac{17}{48}$ B) $-\frac{15}{56}$ C) $\frac{41}{56}$ D) $\frac{41}{48}$

Answer: D

Evaluate the expression for x = –2, y = 3, and a = –4.

279) –8x + 3y – 5a

A) –11 B) –10 C) 51 D) 45

Answer: D

280) 9a + 4y – 7x

A) –55 B) –10 C) –65 D) 38

Answer: B

281) (–6x – 7y)(3a)

A) 108 B) –648 C) 48 D) –108

Answer: A

282) $8x^2$ – 3y – a

A) 25 B) 27 C) 24 D) 21

Answer: B

283) x^3 – 8y + 2a

A) –36 B) –27 C) –24 D) –40

Answer: D

284) $\frac{y+4x}{y-5a}$

A) $-\frac{5}{23}$ B) $-\frac{5}{27}$ C) $-\frac{4}{23}$ D) $-\frac{7}{23}$

Answer: A

285) $\frac{\frac{9}{y}-\frac{a}{2}}{\frac{x}{2}+\frac{6}{y}}$

A) 1 B) 6 C) $\frac{5}{2}$ D) 5

Answer: D

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286) $\frac{-(x+4)^2 - 5y}{-2 - a}$

A) $-\frac{19}{2}$ B) $\frac{13}{2}$ C) $\frac{11}{2}$ D) $\frac{19}{2}$

Answer: A

287) $\frac{3x + 3(1 + a)^2}{y - 1}$

A) $\frac{21}{2}$ B) $\frac{51}{2}$ C) $\frac{27}{2}$ D) $-\frac{15}{2}$

Answer: A

Identify the property illustrated by the statement. Assume all variables represent real numbers.

288) $6 \cdot 1 = 6$

A) Inverse B) Closure C) Identity D) Distributive

Answer: C

289) $(4 + 9) + 1 = (9 + 4) + 1$

A) Distributive B) Commutative C) Associative D) Closure

Answer: B

290) $8 + 0 = 8$

A) Closure B) Identity C) Associative D) Inverse

Answer: B

291) $4(x + 3) = 4x + 12$

A) Associative B) Commutative C) Distributive D) Closure

Answer: C

292) $5 + (-5) = 0$

A) Closure B) Associative C) Identity D) Inverse

Answer: D

293) $3 + 8 = 8 + 3$

A) Associative B) Inverse C) Identity D) Commutative

Answer: D

294) $\frac{1}{(a + 5)} \cdot (a + 5) = 1$, if $a + 5 \neq 0$

A) Closure B) Identity C) Inverse D) Distributive

Answer: C

295) $(6 \cdot 7) \cdot 5 = 6 \cdot (7 \cdot 5)$

A) Commutative B) Identity C) Associative D) Distributive

Answer: C

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296) $8(\pi)$ is a real number.

A) Closure B) Identity C) Associative D) Distributive

Answer: A

Write the expression with only positive exponents and evaluate if possible. Assume all variables represent nonzero real numbers.

297) $\frac{1}{3}(-15y)$

A) 3y B) –5y C) 5y D) 4y

Answer: B

298) $\left(-\frac{5}{2}y\right)(8)$

A) –3y B) –20y C) 20y D) –10y

Answer: B

299) $-\frac{3}{4}(8y + 12x - 4z)$

A) –6y – 9x + 3z B) –6y + 9x + 3z C) –6y + 9x – 3z D) –6y – 9x – 3z

Answer: A

300) $\frac{2}{3}\left(\frac{9}{2}y - 3x + \frac{3}{2}\right)$

A) 3y – 2x + 1 B) 3y + 2x – 1 C) 3y – 2x – 1 D) 3y + 2x + 1

Answer: A

Use the distributive property to rewrite a sum as a product or the product as a sum.

301) –11r + 19r

A) 8r B) 30r C) –8r D) –30r

Answer: A

302) 6 – 8b

A) 2(3 – 7b) B) –2b C) 2(3 – 4b) D) 14b

Answer: C

303) –4(a + b)

A) –4a – 4b B) –4a + 4b C) –4a + b D) –4ab

Answer: A

304) –(4 + 5y)

A) –4 – 5y B) 4 + 5y C) 4 – 5y D) –4 + 5y

Answer: A

305) –(7k + 4a)

A) 7k + 4a B) 7k – 4a C) –7k + 4a D) –7k – 4a

Answer: D

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Determine what signs on values of x and y would make the statement true. Assume that x and y are not 0.

306) $xy < 0$

A) x and y have different signs.
B) x and y must be positive.
C) x and y have the same sign.
D) x and y must be negative.

Answer: A

307) $\frac{x}{y} > 0$

A) x and y have different signs.
B) x and y must be positive.
C) x and y must be negative.
D) x and y have the same sign.

Answer: D

308) $-\frac{x}{y} > 0$

A) x and y have different signs.
B) x and y must be positive.
C) x and y must be negative.
D) x and y have the same sign.

Answer: A

309) $x^2y < 0$

A) x and y must be negative.
B) x and y have different signs.
C) y must be negative.
D) x must be negative.

Answer: C

310) $\frac{x^2}{y} < 0$

A) x and y have different signs.
B) x and y must be negative.
C) y must be negative.
D) x must be negative.

Answer: C

311) $\frac{x^3}{y} > 0$

A) x and y have the same sign.
B) x and y must be negative.
C) x and y must be positive.
D) x and y have different signs.

Answer: A

Solve the problem.

312) The formula $C = \frac{5}{9}(F - 32)$ expresses the relationship between Fahrenheit temperature, F, and Celsius temperature, C. Use the formula to convert 68°F to its equivalent temperature on the Celsius scale.

A) 4°C
B) 20°C
C) 56°C
D) 65°C

Answer: B

313) A stone is dropped from a tower that is 720 feet high. The formula $h = 720 - 16t^2$ describes the stone's height above the ground, h, in feet, t seconds after it was dropped. What is the stone's height 4 seconds after it is released?

A) 489 ft
B) 474 ft
C) 464 ft
D) 439 ft

Answer: C

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314) If a rock falls from a height of 30 meters above the ground, the height H (in meters) after x seconds can be approximated using the formula $H = 30 - 4.9x^2$. What is the height of the rock after 2 seconds?

A) 10.4 m B) 20.2 m C) 100.4 m D) −66.04 m

Answer: A

315) As the relative humidity increases, the temperature seems higher than it is. The formula $T = 0.118x + 59.63$ approximates the apparent temperature for an actual temperature of 65°F, where x is the relative humidity. What is the apparent temperature (to the nearest degree) for a relative humidity of 70%?

A) 493°F B) 130°F C) 60°F D) 68°F

Answer: D

316) Use the formula

$$\text{Passing Rating} \approx 85.68\left(\frac{C}{A}\right) + 4.31\left(\frac{Y}{A}\right) + 326.42\left(\frac{T}{A}\right) - 419.07\left(\frac{I}{A}\right),$$

where A = number of passes attempted, C= number of passes completed, Y = total number of yards gained passing, T = number of touchdown passes, and I = number of interceptions, to approximate the passing rating for C. Felix. Round to the nearest tenth.

Quarterback	A	C	Y	T	I
A. Smith	438	217	3079	23	7
B. Jones	497	267	3193	25	10
C. Felix	624	305	4182	23	16

A) 72.3 B) 72.1 C) 83.2 D) 81.7

Answer: B

317) The Blood Alcohol Concentration (BAC) of a person who has been drinking is given by the expression

number of oz × % alcohol × .075 ÷ body weight in lb − hours of drinking × .015.

Find the BAC to the nearest thousandth for a 170−lb woman, who, in 5 hours, has drunk 2 12−oz beers (24 oz), each having a 3.2% alcohol content.

A) −0.058 B) −333.299 C) −0.368 D) −0.041

Answer: D

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318) The NSC (Not So Consistent) Corporation has just completed its first year of business. The following chart shows its monthly profit (or loss).

Month	Profit (Loss) in Dollars
January	−14,526
February	1874
March	−8977
April	−14,107
May	14,073
June	14,632
July	−13,834
August	−13,170
September	−4860
October	6630
November	−3338
December	−974

The profit was smallest in ___?___ .

A) June B) December C) January D) February

Answer: D

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December	−974

The absolute value of the profit or loss was smallest in ___?___ .

A) January B) June C) February D) December

Answer: D

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320) During a certain football game, a player gained 33 yards rushing and –53 yards returning fumbles. Find his total yardage. Is this the same as the sum of the absolute values of the two categories? Why or why not?

A) 86 yards; No, it is not the same because the sum of the absolute values is –20 .
B) –20 yards; Yes, it is the same.
C) 20; yards; No, it is not the same because the sum of the absolute values is –86.
D) –20 yards; No, it is not the same because the sum of the absolute values is 86.

Answer: D

321) Find the magnitude of the difference between a windchill factor of –23 and a windchill factor of –54.

A) –31 B) –77 C) 77 D) 31

Answer: D

322) Find the magnitude of the difference between a windchill factor of 97 and a windchill factor of –92.

A) 189 B) 5 C) –189 D) –5

Answer: A

323) It is recommended that a woman who is pregnant should exercise such that her heart rate does not exceed 140 beats per minute. Use absolute value notation to write an expression that describes the difference between the heart rate achieved by each of the following pregnant women and the recommended maximum heart rate. Then evaluate that expression.

(i) Abigail: 137 beats per minute
(ii) Mathilda: 144 beats per minute

A) (i) Abigail: $137 - 140 = -3$
(i) Mathilda: $144 - 140 = 4$

B) (i) Abigail: $|137 + 140| = 277$
(ii) Mathilda: $|144 + 140| = 284$

C) (i) Abigail: $|137 - 140| = 3$
(ii) Mathilda: $|144 - 140| = 4$

D) (i) Abigail: $|140 - 137| = -3$
(ii) Mathilda: $|140 - 144| = -4$

Answer: C

Write the expression with only positive exponents and evaluate if possible. Assume all variables represent nonzero real numbers.

324) 4^{-3}

A) $-\frac{1}{64}$ B) –64 C) $\frac{1}{64}$ D) –12

Answer: C

325) $(3x)^{-3}$

A) $\frac{1}{27x^3}$ B) $-27x^2$ C) $-9x$ D) $-\frac{1}{9x}$

Answer: A

326) $5x^{-2}$

A) $\frac{5}{x^2}$ B) $-\frac{1}{10x}$ C) $\frac{1}{25x^2}$ D) $-10x$

Answer: A

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327) -8^{-4}

A) -4096 B) $\frac{1}{4096}$ C) $-\frac{1}{4096}$ D) 4096

Answer: C

328) $(-4)^{-3}$

A) -64 B) $\frac{1}{64}$ C) $-\frac{1}{64}$ D) 64

Answer: C

329) $-(-2)^{-3}$

A) $-\frac{1}{8}$ B) 8 C) -8 D) $\frac{1}{8}$

Answer: D

330) $(-4)^{-2}$

A) $-\frac{1}{16}$ B) 16 C) $\frac{1}{16}$ D) -16

Answer: C

331) $-(-2)^{-6}$

A) $\frac{1}{64}$ B) 64 C) -64 D) $-\frac{1}{64}$

Answer: D

332) $\left(\frac{3}{5}\right)^{-3}$

A) $\frac{27}{125}$ B) $-\frac{27}{125}$ C) $\frac{125}{27}$ D) $-\frac{125}{27}$

Answer: C

333) $-x^{-5}$

A) $\frac{1}{x^5}$ B) $-5x$ C) $5x$ D) $-\frac{1}{x^5}$

Answer: D

Perform the indicated operations. Write the result using only positive exponents. Assume all variables represent nonzero real numbers.

334) $\frac{9^8}{9^6}$

A) $\frac{1}{9^2}$ B) 2 C) 9^2 D) 81^2

Answer: C

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335) $\frac{7^{-7}}{7^{-5}}$

A) 7^{12} B) $\frac{1}{7^{12}}$ C) $\frac{1}{7^{2}}$ D) 7^{2}

Answer: C

336) $\frac{3^{-4}}{3^{8}}$

A) -3^{12} B) $\frac{1}{3^{32}}$ C) $\frac{1}{3^{12}}$ D) $\frac{1}{6^{12}}$

Answer: C

337) $\frac{x^{2}}{x^{-4}}$

A) $-x^{2}$ B) $\frac{1}{x^{2}}$ C) $\frac{1}{x^{6}}$ D) x^{6}

Answer: D

338) $\frac{x^{16}}{x^{3}}$

A) $-x^{13}$ B) x^{19} C) x^{13} D) $\frac{1}{x^{13}}$

Answer: C

339) $\frac{x^{5}}{x^{14}}$

A) $\frac{1}{x^{9}}$ B) $\frac{1}{x^{19}}$ C) $-x^{9}$ D) x^{9}

Answer: A

340) $\frac{x^{-12}}{x^{-8}}$

A) $\frac{1}{x^{20}}$ B) $-x^{20}$ C) x^{4} D) $\frac{1}{x^{4}}$

Answer: D

341) $\frac{x^{-4}}{x^{-17}}$

A) $\frac{1}{x^{13}}$ B) $-x^{13}$ C) $\frac{1}{x^{21}}$ D) x^{13}

Answer: D

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342) $\frac{4x^{-4}}{8x^{-8}}$

A) $\frac{x^4}{2}$ B) $\frac{x^4}{4}$ C) $\frac{x^2}{2}$ D) $\frac{x^{12}}{2}$

Answer: A

343) $\frac{(x^{-4})^0}{8x^{-8}}$

A) $\frac{x^{12}}{8}$ B) $8x^8$ C) $\frac{x^8}{8}$ D) 0

Answer: C

344) $\frac{x^{-5}\,y^5}{x^{-2}\,y^2}$

A) $\frac{x^4}{y^4}$ B) $\frac{x^3}{y^3}$ C) $\frac{y^3}{x^3}$ D) $\frac{y^4}{x^4}$

Answer: C

345) $(x^{-7}\,y^7)(x^{-2}\,y^4)^{-1}$

A) $\frac{x^6}{y^4}$ B) $\frac{x^5}{y^3}$ C) $\frac{y^3}{x^5}$ D) $\frac{y^4}{x^6}$

Answer: C

346) $\frac{12a^{-3}b^3}{2a^{-10}b^6}$

A) $-\frac{a^6}{6b^4}$ B) $\frac{6a^7}{b^3}$ C) $-6ab^2$ D) $\frac{6b^4}{a^7}$

Answer: B

347) $(5x^{-3})^3(x^2)^{-4}$

A) $\frac{1}{5^{-9}x^{17}}$ B) $\frac{5^3}{x^2}$ C) $\frac{5^3}{x^{17}}$ D) 5^3x^{72}

Answer: C

348) $\frac{16r^5(r^{-2})^3}{5(r^3)^{-3}}$

A) $\frac{16}{5r^6}$ B) $\frac{16r^6}{5}$ C) $\frac{16}{5r^8}$ D) $\frac{16r^8}{5}$

Answer: D

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349) $\frac{(3x^6y^2)^5}{9xy^2}$

A) $27x^{29}y^8$ B) $27x^{10}y^5$ C) $\frac{x^{29}y^8}{3}$ D) $\frac{x^{10}y^5}{3}$

Answer: A

Evaluate the expression.

350) $1369^{1/2}$

A) 18.5 B) 148 C) 74 D) 37

Answer: D

351) $125^{1/3}$

A) 15 B) 1875 C) 5 D) 625

Answer: C

352) $81^{1/4}$

A) 36 B) 12 C) 3 D) 243

Answer: C

353) $216^{4/3}$

A) 46,656 B) 7776 C) 279,936 D) 1296

Answer: D

354) $16^{5/4}$

A) 128 B) 32 C) 256 D) 512

Answer: B

355) $32^{4/5}$

A) 16 B) 512 C) 256 D) 128

Answer: A

356) $(-27)^{1/3}$

A) not a real number B) –27 C) 3 D) –3

Answer: D

357) $(-27)^{2/3}$

A) –3 B) –9 C) not a real number D) 9

Answer: D

358) $(-144)^{1/2}$

A) –6 B) not a real number C) 12 D) –12

Answer: B

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359) $-\left(\frac{9}{4}\right)^{1/2}$

A) $\frac{2}{3}$ B) $-\frac{9}{8}$ C) $-\frac{3}{2}$ D) not a real number

Answer: C

360) $\left(\frac{81}{16}\right)^{-1/2}$

A) not a real number B) $\frac{9}{4}$ C) $\frac{4}{9}$ D) $\frac{81}{32}$

Answer: C

361) $\left(-\frac{16}{49}\right)^{-1/2}$

A) $\frac{4}{7}$ B) $\frac{8}{49}$ C) $-\frac{7}{4}$ D) not a real number

Answer: D

362) $\left(\frac{81}{4}\right)^{1/2}$

A) not a real number B) $\frac{9}{4}$ C) $\frac{9}{2}$ D) $\frac{81}{2}$

Answer: C

363) $\left(-\frac{1}{8}\right)^{-2/3}$

A) not a real number B) $\frac{1}{4}$ C) 512 D) 4

Answer: D

364) $\left(\frac{1}{27}\right)^{5/3}$

A) $\frac{1}{243}$ B) – 45 C) not a real number D) – 243

Answer: A

365) $\left(-\frac{27}{64}\right)^{-2/3}$

A) $\frac{16}{9}$ B) $-\frac{9}{16}$ C) not a real number D) $\frac{9}{16}$

Answer: A

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Perform the indicated operations. Write the answer using only positive exponents. Assume all variables represent positive real numbers.

366) $x^{1/4} \cdot x^{3/4}$

A) $x^{3/16}$ B) x C) $x^{3/4}$ D) $\frac{1}{x}$

Answer: B

367) $\frac{y^{9/8}}{y^{5/8}}$

A) $y^{9/8}$ B) $\frac{1}{y}$ C) $y^{1/2}$ D) y

Answer: C

368) $z^{-2/5} \cdot z^{3/5}$

A) $z^{6/5}$ B) $z^{5/6}$ C) $z^{-1/5}$ D) $z^{1/5}$

Answer: D

369) $\left(\frac{x^3}{y^{-6}}\right)^{1/3}$

A) $\frac{x}{y^2}$ B) $xy^{1/2}$ C) xy^2 D) xy

Answer: C

370) $(9k^2m^{-4})^{1/2}$

A) $\frac{2k}{m^2}$ B) $\frac{3k}{m^2}$ C) $3km^2$ D) $2km^2$

Answer: B

371) $\frac{x^{1/2}}{x^{3/4} \cdot x^{-2}}$

A) $\frac{1}{x^{13/4}}$ B) $x^{7/4}$ C) $\frac{1}{x^{7/4}}$ D) $x^{13/4}$

Answer: B

372) $\frac{x^{3/5}}{x^{6/5} \cdot x^{-5}}$

A) $x^{22/5}$ B) $\frac{1}{x^{34/5}}$ C) $\frac{1}{x^{22/5}}$ D) $x^{34/5}$

Answer: A

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373) $\dfrac{(x^{1/3})^2}{(x^3)^{8/3}}$

A) $\dfrac{1}{x^{26/3}}$ B) $\dfrac{1}{x^{22/3}}$ C) $x^{26/3}$ D) $x^{22/3}$

Answer: B

374) $\left(\dfrac{r^{-4/3}}{b^{-5/2}}\right)^2\left(\dfrac{b^{1/7}}{r^{1/5}}\right)^{-2}$

A) $\dfrac{b^{33/7}}{r^{34/15}}$ B) $\dfrac{r^{46/15}}{b^{37/7}}$ C) $\dfrac{r^{34/15}}{b^{33/7}}$ D) $\dfrac{b^{37/7}}{r^{46/15}}$

Answer: A

375) $\dfrac{x^{1/2}}{(x^2)^{-1/2}} \cdot \dfrac{x^{2/5}}{x^{-3/10}}$

A) $\dfrac{1}{x^{22/7}}$ B) $\dfrac{1}{x^{11/5}}$ C) $x^{11/5}$ D) $x^{22/7}$

Answer: C

Find the product. Assume variables represent positive real numbers.

376) $y^{1/3}(y^{4/9} - 6y^{2/9})$

A) $y^{7/9} - 6y^{5/9}$ B) $y^{4/27} - 6y^{2/27}$ C) $y^{3/4} - 6y^{3/2}$ D) $y^{-1/9} - 6y^{1/9}$

Answer: A

377) $2k^{1/8}(8k^{3/8} + 4k^{3/4})$

A) $16k^{1/2} - 8k^{7/8}$ B) $16k^{-1/4} - 8k^{-5/8}$ C) $16k^{3/64} + 8k^{3/32}$ D) $16k^{1/2} + 8k^{7/8}$

Answer: D

378) $6x^{6/5}(x^{11/5} - 3x)$

A) $\dfrac{6}{x^{17/5}} - 18x^{11/5}$ B) $6x^{17/5} - 18x^{11/5}$ C) $6x^{17/5} - \dfrac{18}{x^{11/5}}$ D) $\dfrac{6}{x^{17/5}} - \dfrac{18}{x^{11/5}}$

Answer: B

379) $y^{4/17}(y^{3/17} - 7y^{2/17})$

A) $y^{1/17} - 7y^{2/17}$ B) $y^{7/17} - 7y^{6/17}$ C) $y^{4/3} - 7y^{4/2}$ D) $y^{12/289} - 7y^{8/289}$

Answer: B

380) $(2p^{2/7} - 5p^{3/7})^2$

A) $4p^{4/7} - 10p^{-10/7} - 10p^{6/7}$ B) $4p^{4/49} + 5p$

C) $4p^{4/7} - 20p^{5/7} + 25p^{6/7}$ D) $4p^{4/7} - 10p^{5/7} + 25p^{6/7}$

Answer: C

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381) $(m^{1/6} + m^{-1/6})(m^{-1/6} - m^{1/6})$

A) $-m^{1/3} + m^{-1/3}$ B) $1 - m^{1/3} + m^{-1/3} - m$

C) $m - m^{1/3} + m^{-1/3} - 1$ D) $m^{1/3} - m^{-1/3}$

Answer: A

Calculate the value mentally.

382) $0.1^{1/2} \cdot 490^{1/2}$

A) 14 B) 28 C) 3.5 D) 7

Answer: D

383) $\frac{400^{3/2}}{4^{3/2}}$

A) 100 B) none of these C) 10 D) 1,000

Answer: D

384) $\frac{27^{1/2}}{3^{1/2}}$

A) none of these B) 24 C) 9 D) 3

Answer: D

Factor, using the given factor. Assume all variables represent positive real numbers.

385) $x^{7/8} + 3x^{6/8}$; $x^{6/8}$

A) $x^{1/8}(x^{1/8} + 3)$ B) $x^{3/4}(x^{1/8} + 3)$ C) $x^{1/8}(x^{7/8} + 3)$ D) $x^{3/4}(x^{-1/8} + 3)$

Answer: B

386) $9s^{5/7} - 14s^{-6/7}$; $s^{-6/7}$

A) $s^{-6/7}(9s^{11/7} - 14)$ B) $s^{5/7}(9s^{11/7} - 14^{11/14})$

C) $s^{-6/7}(9s^{11/7} - 14s)$ D) $s^{1/3}(9 - 14s^{11/14})$

Answer: A

387) $4k^{-4} + k^{-6}$; k^{-6}

A) $k^{-6}(4k^3 + 1)$ B) $k^{-6}(4k^{-2} + 1)$ C) $4k^{-6}(k^2 + 1)$ D) $k^{-6}(4k^2 + 1)$

Answer: D

388) $x^{-10} - 9x^{-4}$; x^{-10}

A) $x^{-10}(x - 9x^7)$ B) $x^{-10}(x - 9x^6)$ C) $x^{-10}(1 - 9x^6)$ D) $x^{-10}(1 + 9x^8)$

Answer: C

389) $8m^{7/4} - 3m^{-1/2}$; $m^{-1/2}$

A) $m^{-1/2}(8m^{7/4} + 3)$ B) $m^{-1/2}(24m^{9/4} - 8)$ C) $m^{-1/2}(8m^{9/4} - 3)$ D) $3m^{-1/4}(8m^{9/4} - 1)$

Answer: C

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390) $(q + 7)^{-3/17} + (q + 7)^{-1/17} + (q + 7)^{1/17}$; $(q + 7)^{-3/17}$

A) $(q + 7)^{-3/17}[1 + (q + 7)^{-2/17} + (q + 7)^{-4/17}]$

B) $(q + 7)^{-3/17}[1 + (q + 7)^{4/17} + (q + 7)^{6/17}]$

C) $(q + 7)^{-3/17}[1 + (q + 7)^{2/17} + (q + 7)^{4/17}]$

D) $(q + 7)^{-3/17}[1 + (q + 7)^{1/17} + (q + 7)^{3/17}]$

Answer: C

391) $(5m + 5)^{-2/5} + (5m + 5)^{1/5} + (5m + 5)^{7/5}$; $(5m + 5)^{-2/5}$

A) $(5m + 5)^{-2/5}[1 + (5m + 5)^{4/5} + (5m + 5)^{7/5}]$

B) $(5m + 5)^{-2/5}[1 + (5m + 5)^{3/5} - (5m + 5)^{9/5}]$

C) $(5m + 5)^{-2/5}[1 + (5m + 5)^{-3/5} + (5m + 5)^{-9/5}]$

D) $(5m + 5)^{-2/5}[1 + (5m + 5)^{3/5} + (5m + 5)^{9/5}]$

Answer: D

392) $9(2x - 1)^{-3/4} + 18(2x - 1)^{1/4} + 36(2x - 1)^{5/4}$; $9(2x - 1)^{-3/4}$

A) $18(2x - 1)^{-3/4}(4x^2 - 6x - 1)$

B) $9(2x - 1)^{-3/4}(16x^2 - 12x - 3)$

C) $18(2x - 1)^{-3/4}(4x^2 - 6x + 1)$

D) $9(2x - 1)^{-3/4}(16x^2 - 12x + 3)$

Answer: D

393) $18y^4(3y + 1)^{-2/5} + 24y^3(3y + 1)^{3/5} - 48y^2(3y + 1)^{8/5}$; $6y^2(3y + 1)^{-2/5}$

A) $6y^2(3y + 1)^{-2/5}(47y^2 - 44y + 8)$

B) $6y^2(3y + 1)^{-2/5}(57y^2 - 44y + 8)$

C) $6y^2(3y + 1)^{-2/5}(-57y^2 - 44y - 8)$

D) $6y^2(3y + 1)^{-2/5}(-47y^2 - 44y - 8)$

Answer: C

Perform the indicated operation and write your answer with positive integer exponents.

394) $\dfrac{m^{-1} - n^{-1}}{(mn)^{-1}}$

A) $n - m$ B) $m + n$ C) $m - n$ D) $-n - m$

Answer: A

395) $\dfrac{m^{-1} + n^{-1}}{(mn)^{-1}}$

A) $-n - m$ B) $n + m$ C) $-n + m$ D) $n - m$

Answer: B

396) $\dfrac{m^{-1} - n^{-1}}{m^{-1} + n^{-1}} \cdot \dfrac{m + n}{m - n}$

A) $\dfrac{mn}{m + n}$ B) $\dfrac{m - n}{m}$ C) 1 D) -1

Answer: D

397) $\dfrac{mn^{-1} - nm^{-1}}{m^2 - n^2}$

A) mn B) m+n C) $\dfrac{1}{mn}$ D) $\dfrac{1}{m+n}$

Answer: C

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398) $\dfrac{(mn)^{-1}}{m^{-2}+n^{-2}}$

A) $\dfrac{mn}{n^2+m^2}$ B) $\dfrac{m^2+n^2}{mn}$ C) $\dfrac{n}{n^2-m^2}$ D) $\dfrac{mn}{n+m}$

Answer: A

399) $\dfrac{x^2-9y^{-2}}{(x-3y^{-1})(x+3y^{-1})}$

A) -1 B) 1 C) $\dfrac{xy^2}{y-x}$ D) $\dfrac{y^2-x}{xy-3}$

Answer: B

Simplify the rational expression. Use factoring, and assume all variable expressions represent positive real numbers.

400) $\dfrac{4(x^2-1)^3+8x(x^2-1)^4}{16(x^2-1)^3}$

A) $\dfrac{1+2x^3+2x}{4}$ B) $\dfrac{1+2x^3-2x}{4}$ C) $\dfrac{1-2x^3+2x}{8}$ D) $\dfrac{1-2x^3-2x}{8}$

Answer: B

401) $\dfrac{(x^2+2)^4(4x)-x^2(16)(x^2+2)^3(4x)}{(x^2+2)^8}$

A) $\dfrac{(4x)(2-17x^2)}{(x^2+2)^5}$ B) $\dfrac{(4x)(2+17x^2)}{(x^2+2)^5}$ C) $\dfrac{(4x)(2-15x^2)}{(x^2+2)^5}$ D) $\dfrac{(4x)(2+15x^2)}{(x^2+2)^5}$

Answer: C

402) $\dfrac{2(2x-1)^{1/3}-(x-1)(2x-1)^{-2/3}}{(2x-1)^{2/3}}$

A) $\dfrac{3x+1}{(2x+1)^{5/3}}$ B) $\dfrac{3x-1}{(2x+1)^{4/3}}$ C) $\dfrac{5x+1}{(2x+1)^{4/3}}$ D) $\dfrac{5x-1}{(2x+1)^{5/3}}$

Answer: B

Solve the problem.

403) The algebraic expression $0.07d^{3/2}$ describes the duration of a storm, in hours, whose diameter is d miles. Use a calculator to determine the duration of a storm with a diameter of 7 miles. Round to the nearest hundredth.

A) 1.3 hr B) 18.52 hr C) 0.19 hr D) 0.34 hr

Answer: A

404) A formula for calculating the distance, d, one can see from an airplane to the horizon on a clear day is $d = 1.22x^{1/2}$, where x is the altitude of the plane in feet and d is given in miles. How far can one see in a plane flying at 23,000 feet? Round your answer to the nearest tenth mile, if necessary.

A) 167.5 mi B) 185.0 mi C) 14,030 mi D) 1403 mi

Answer: B

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405) In an economics study, three quantities m, p, and q have been found to be related by the equation $m = p^{1/2} \cdot q^{1/2}$. Find m, if $p = 36$ and $q = 4$.

A) 8 B) 12 C) 24 D) 144

Answer: B

406) A manufacturer's cost is given by $C = 400n^{1/3} + 1100$, where C is the cost in dollars and n is the number of parts produced. Find the cost when 729 parts are produced.

A) \$2900 B) \$44 C) \$11,900 D) \$4700

Answer: D

407) The cost of manufacturing clocks is given by $c = 36(n + 121)^{1/2}$, where c is the cost in dollars and n is the number produced. What is the cost when no clocks are produced?

A) \$66 B) \$396 C) \$4356 D) \$36

Answer: B

408) When determining appropriate doses of medication, it is sometimes important to estimate the body surface area (BSA) of a patient. This surface area (in m^2) can be approximated using the Mosteller formula

$$BSA = \left(\frac{h \cdot w}{3600}\right)^{1/2},$$

where h is the patient's height in centimeters and w is the weight in kilograms. Determine the BSA for a patient with height 183 cm and weight 85 kg. Round your answer to two decimal places.

A) 18.67 m^2 B) 0.03 m^2 C) 2.08 m^2 D) 4.32 m^2

Answer: C

409) If the lengths of the sides of a square are tripled, by what factor will the area change?

A) 3 B) 27 C) 9 D) 6

Answer: C

410) If the radius of a sphere is doubled, by what factor will the volume change?

A) 4 B) 2 C) 6 D) 8

Answer: D

Simplify the expression. Assume all variables represent nonzero real numbers.

411) $(2a^4) \cdot (8a^2)$

A) 10^8 B) $16a^6$ C) $16a^8$ D) 10^6

Answer: B

412) $(-2n^6) \cdot (-8n^5)$

A) $-10n^{11}$ B) $16n^{30}$ C) $-10n^{30}$ D) $16n^{11}$

Answer: D

413) $2^5 \cdot 2^7$

A) 2^{12} B) 2^{35} C) 4^{12} D) 4^{35}

Answer: A

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414) $x^4 \cdot x^2$

A) $(2x)^6$ B) $(2x)^8$ C) x^8 D) x^6

Answer: D

415) $4^5 \cdot 4^3$

A) 16^{15} B) 4^8 C) 8^8 D) 4^{15}

Answer: B

416) $(2a^8b^5)(-2a^7b^2)$

A) $-4a^{56}b^4$ B) $4a^{55}b^4$ C) $-4a^{15}b^7$ D) $4a^{15}b^8$

Answer: C

417) $(-4x^4y)(-10x^5y^3)$

A) $-14x^9y^3$ B) $-40x^9y^3$ C) $40x^{20}y^3$ D) $40x^9y^4$

Answer: D

418) $(-4t^4)(5t^2)(-3t^8)$

A) $60t^{14}$ B) $-2t^{14}$ C) $-2t^{12}$ D) $60t^{15}$

Answer: A

419) $\left(\frac{3x^2y^4}{z^4}\right)^4$

A) $\frac{3x^8y^{16}}{z^8}$ B) $\frac{3x^8y^{16}}{z^{16}}$ C) $\frac{81x^6y^8}{z^8}$ D) $\frac{81x^8y^{16}}{z^{16}}$

Answer: D

420) $-\left(\frac{2x^3}{y^2}\right)^0$

A) $\frac{16x^{12}}{y^8}$ B) -1 C) $\frac{y^2}{16x^{12}}$ D) 1

Answer: B

Decide whether the expression has been simplified correctly.

421) $(ab)^2 = ab^2$

A) Not simplified correctly B) Simplified correctly

Answer: A

422) $\left(\frac{x}{8}\right)^6 = \frac{x^6}{8}$

A) Simplified correctly B) Not simplified correctly

Answer: B

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423) $5^0x = 0$

A) Not simplified correctly B) Simplified correctly

Answer: A

424) $6^0x = 6x$

A) Simplified correctly B) Not simplified correctly

Answer: B

425) $3^0x = 1$

A) Not simplified correctly B) Simplified correctly

Answer: A

426) $4^0x = x$

A) Not simplified correctly B) Simplified correctly

Answer: B

427) $x^6 \cdot x^2 = x^8$

A) Simplified correctly B) Not simplified correctly

Answer: A

428) $(x^4)^2 = x^6$

A) Simplified correctly B) Not simplified correctly

Answer: B

429) $x^7 \cdot x^2 = x^{14}$

A) Simplified correctly B) Not simplified correctly

Answer: B

430) $(x^6)^2 = x^{12}$

A) Simplified correctly B) Not simplified correctly

Answer: A

Simplify the expression. Assume all variables represent nonzero real numbers.

431) $(x^2)^4$

A) $4x^2$ B) x^6 C) x^8 D) $8x$

Answer: C

432) $(5^3)^4$

A) 25^7 B) 5^7 C) 5^{12} D) 25^{12}

Answer: C

433) $(7t)^2$

A) 7^2t^2 B) $14t^2$ C) 7^2t D) $7t^2$

Answer: A

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434) $(x^8y^9)^3$

A) x^8y^{27} B) $x^{512}y^{729}$ C) $x^{24}y^{27}$ D) $x^{11}y^{12}$

Answer: C

435) $(4xy)^4$

A) $256xy$ B) $16x^4y^4$ C) $16xy$ D) $256x^4y^4$

Answer: D

436) $(-3x)^5$

A) $-243x^5$ B) $243x$ C) $15x^5$ D) $-15x$

Answer: A

437) $(-5x)^4$

A) $-625x^4$ B) $20x$ C) $-20x$ D) $625x^4$

Answer: D

438) $\left(\frac{2}{x}\right)^4$

A) $\frac{2}{x^4}$ B) $\frac{16}{x}$ C) $16x^4$ D) $\frac{16}{x^4}$

Answer: D

439) $\left(\frac{a^4}{b^5}\right)^3$

A) $\frac{a^{15}}{b^{12}}$ B) $\frac{a^{12}}{b^5}$ C) $\frac{a^5}{b^{15}}$ D) $\frac{a^{12}}{b^{15}}$

Answer: D

Write the expression with only positive exponents and evaluate if possible. Assume all variables represent nonzero real numbers.

440) 7^0

A) 0 B) 7 C) -1 D) 1

Answer: D

441) -11^0

A) -1 B) 0 C) -11 D) 1

Answer: A

442) $(-3)^0$

A) 0 B) -1 C) 3 D) 1

Answer: D

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443) $-(-11)^0$

A) –1 B) 11 C) 0 D) 1

Answer: A

444) $8x^0$

A) 8 B) x C) 1 D) 0

Answer: A

445) $-9x^0$

A) 1 B) –1 C) 0 D) –9

Answer: D

446) $(5x)^0$

A) 1 B) 0 C) 5 D) 5x

Answer: A

447) $(-2x)^0$

A) 2 B) 1 C) –1 D) 0

Answer: B

Identify the expression as a polynomial or not a polynomial.

448) $12x - 18$

A) Not a polynomial B) Polynomial

Answer: B

449) $6x - \frac{3}{x} + 19$

A) Not a polynomial B) Polynomial

Answer: A

450) $7x^5 + 5x^3 - 13$

A) Polynomial B) Not a polynomial

Answer: A

451) $\frac{8}{x^5} + \frac{8}{x^2} - 15$

A) Not a polynomial B) Polynomial

Answer: A

452) $0.5x^7 - 8.4$

A) Not a polynomial B) Polynomial

Answer: B

453) –6

A) Not a polynomial B) Polynomial

Answer: B

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454) $3x^2y^3 + 2x^3y + 9x$

A) Not a polynomial B) Polynomial

Answer: B

Determine the degree of the polynomial.

455) $4x^6 - 8x^7 + 9x^2 - 7$

A) 6 B) 7 C) 4 D) 15

Answer: B

456) $3a^2 + 14a^5 - 6a$

A) 3 B) 8 C) 7 D) 5

Answer: D

457) $-3a^4 - 13a^2 + 9a + 4a^6$

A) 13 B) 6 C) 4 D) 12

Answer: B

458) $-2x^2 + 2x^3 + 4x^4 + 1$

A) 9 B) 2 C) 10 D) 4

Answer: D

459) $2t^6 + 3t^3 + 7 - 3t^2$

A) 6 B) 4 C) 11 D) 12

Answer: A

460) $-a + 8a^3 - 4a^7 + 3a^2$

A) 7 B) 4 C) 13 D) 12

Answer: A

461) $t - 3t^2 + 7t^3 + 3$

A) 1 B) 3 C) 6 D) 4

Answer: B

462) $-x - 2x^2 - 3x^3 - 4x^5$

A) 5 B) 11 C) 10 D) 4

Answer: A

Identify the polynomial as a monomial, binomial, trinomial, or none of these.

463) $13x^2$

A) Monomial B) Trinomial C) None of these D) Binomial

Answer: A

464) $-15x$

A) Monomial B) None of these C) Binomial D) Trinomial

Answer: A

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465) $-12y^4 - 1$

A) Binomial B) Monomial C) None of these D) Trinomial

Answer: A

466) $-20z + 3$

A) Trinomial B) None of these C) Binomial D) Monomial

Answer: C

467) $-15s^4 - 9s + 2$

A) Monomial B) Trinomial C) Binomial D) None of these

Answer: B

468) $6y^5 - 3y^4 + -1$

A) None of these B) Trinomial C) Monomial D) Binomial

Answer: B

469) $7c^4 - 6c^3 + 7c^2$

A) Monomial B) Trinomial C) Binomial D) None of these

Answer: B

470) $13z^5 + 6z^4 - 4z^3 + 12$

A) Monomial B) Binomial C) Trinomial D) None of these

Answer: D

471) $15x^4 - 9w^3 + 3w + 5y^5 + 3$

A) None of these B) Trinomial C) Binomial D) Monomial

Answer: A

472) -6

A) Binomial B) Monomial C) None of these D) Trinomial

Answer: B

Find the sum or difference.

473) $(7a^4 + 7a^3) + (2a^4 - 9a^3)$

A) $7a^7$ B) $7a^{14}$ C) $9a^8 - 2a^6$ D) $9a^4 - 2a^3$

Answer: D

474) $(4n^5 + 6n + 4n^4) + (8n^4 + 8n^5 + 4n)$

A) $12n + 12n^5 + 10n^4$ B) $12n^5 + 12n^4 + 10n$ C) $34n^{10}$ D) $14n^5 + 12n^4 + 8n$

Answer: B

475) $(6 + 4x^7 + 2x^9 - 6x^8) + (3x^8 + 8x^7 - 9 + 9x^9)$

A) $11x^9 - 3x^8 + 12x^7 - 3$ B) $11x^{18} - 3x^{16} + 12x^{14} - 3$

C) $9x^9 + 9x^8 - 7x^7 + 3$ D) $20x^{48} - 3$

Answer: A

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476) $(7x^3 + 4x^5 - 6 - 7x^4) - (-1 - 4x^4 + 9x^5 - 5x^3)$

A) $-5x^5 - 3x^4 + 12x^3 - 5$
B) $13x^5 - 11x^4 + 2x^3 - 5$
C) $-5x^5 - 11x^4 + 2x^3 - 7$
D) $13x^5 - 11x^4 + 2x^3 - 7$

Answer: A

477) $2(-2r^4 + 9r^3 - 3r) - 3(8r^4 - 9r^3 + 6r^2 - 2r)$

A) $-28r^4 + 18r^3 - 6r^2 - r$
B) $-28r^4 + 6r^2 - 5r$
C) $-28r^4 + 45r^3 - 18r^2$
D) $-28r^4 - 9r^3 + 18r^2 - 12r$

Answer: C

478) $(-6 + 9x^3 + 4x^5 - 4x^4) + (-9x^4 + 8x^3 - 1 + 8x^5)$

A) $16x^{24} - 7$
B) $12x^{10} - 13x^8 + 17x^6 - 7$
C) $12x^5 - 13x^4 + 17x^3 - 7$
D) $-15x^5 - 15x^4 + 3x^3 + 4$

Answer: C

479) $(8x^3 + 9x^5 - 1 - 2x^4) - (-2 + 9x^4 + 5x^5 + 3x^3)$

A) $4x^5 + 7x^4 + 11x^3 - 3$
B) $4x^5 - 11x^4 + 5x^3 + 1$
C) $14x^5 + 7x^4 + 11x^3 + 1$
D) $14x^5 + 7x^4 + 11x^3 - 3$

Answer: B

480) $(9x^9 + 9x^7 - 3x^2 + 5) - (5x^9 - 2x^4 + 6x^2 - 6)$

A) $4x^9 + 9x^7 - 2x^4 - 9x^2 + 11$
B) $-4x^9 + 9x^7 + 2x^4 - 9x^2 + 11$
C) $-4x^9 + 9x^7 - 2x^4 - 9x^2 + 11$
D) $4x^9 + 9x^7 + 2x^4 - 9x^2 + 11$

Answer: D

481) $(2x^4 - 5x^2 + x) - (6x^3 + 9x^2 + 8x) + (5x^2 - x)$

A) $2x^4 + 6x^3 - 19x^2 - 8x$
B) $3x^5 + 7x^4 - 8x$
C) $2x^4 - 6x^3 - 7x^2 + 8x$
D) $2x^4 - 6x^3 - 9x^2 - 8x$

Answer: D

482) $-(4x^3 + x - 5) + (8x^3 + 3x^2) - (7x^2 - 3x - 1)$

A) $4x^3 + 4x^2 + 4x - 6$
B) $3x^3 - 2x^2 - 2x + 6$
C) $12x^3 - 10x^2 + 2x - 6$
D) $4x^3 - 4x^2 + 2x + 6$

Answer: D

Find the product.

483) $(2m^4)(4m^4)$

A) $8m$
B) $-8m$
C) $-8m^8$
D) $8m^8$

Answer: D

484) $(-2m^3)(2m^2)$

A) $-4m^5$
B) $4m$
C) $4m^6$
D) $-4m$

Answer: A

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485) $(-4x^2y^4)(-2x^3y^2)$

A) $8x^5y^6$ B) $8xy^6$ C) $8xy^5$ D) $8x^6y^5$

Answer: A

486) $-8x^6(10x - 1)$

A) $-80x^6 + 8$ B) $80x^7 - 8x^6$ C) $-72x^7$ D) $-80x^7 + 8x^6$

Answer: D

487) $6x^2(11x^6 - 8x^2)$

A) $66x^{12} - 48x^4$ B) $66x^8 - 8x^2$ C) $66x^8 + 48x^4$ D) $66x^8 - 48x^4$

Answer: D

488) $-2ax^3(12ax^5 - 5x^3 - 11)$

A) $-24a^2x^8 + 10ax^6 + 22ax^3$ B) $-24ax^{15} + 10ax^9 + 22ax^3$

C) $24a^2x^8 - 10ax^6 - 22ax^3$ D) $24a^2x^{15} - 10ax^9 - 22ax^3$

Answer: A

489) $11ax^5(7ax^7 - 2x^6 + 12a)$

A) $77a^2x^{12} + 22ax^{11} - 132a^2x^5$ B) $77a^2x^{12} - 22ax^{11} + 132a^2x^5$

C) $77ax^{12} - 22ax^{11} + 132ax^5$ D) $77a^2x^{35} - 22ax^{30} + 132a^2x^5$

Answer: B

490) $-8a^2x^5(-8a^8x^7 + 11x^6 + 12a)$

A) $-64a^{10}x^{12} + 88a^2x^{11} + 96a^3x^5$ B) $64a^{10}x^{12} + 11x^6 + 12a$

C) $64a^{10}x^{12} - 88a^2x^{11} - 96a^3x^5$ D) $64a^{16}x^{35} + 88a^2x^{30} + 96a^2x^5$

Answer: C

491) $5x^3(-4x^6 + 7x^4)$

A) $15x^3$ B) $-20x^9 + 7x^4$ C) $15x^9 + 15x^7$ D) $-20x^9 + 35x^7$

Answer: D

492) $(5m^3z^4)(4m^4z^2)$

A) $20mz^7$ B) $20mz^6$ C) $20m^7z$ D) $20m^7z^6$

Answer: D

493) $(2x + 11)(x + 4)$

A) $x^2 + 19x + 18$ B) $2x^2 + 18x + 44$ C) $x^2 + 44x + 19$ D) $2x^2 + 19x + 44$

Answer: D

494) $(x + 8)(4x - 5)$

A) $4x^2 - 40x + 27$ B) $4x^2 + 27x - 40$ C) $4x^2 + 26x - 40$ D) $x^2 + 27x + 27$

Answer: B

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495) $(x - 11)(5x + 6)$

A) $5x^2 - 49x - 49$ B) $5x^2 - 66x - 49$ C) $5x^2 - 51x - 66$ D) $5x^2 - 49x - 66$

Answer: D

496) $(x - 12y)(x + 10y)$

A) $x^2 - 5xy - 120y^2$ B) $x^2 - 2xy - 2y^2$ C) $x^2 - 2xy - 120y^2$ D) $x - 2xy - 120y$

Answer: C

497) $(6a + 7b)(-7a + 2b)$

A) $-42a^2 - 37ab + 14b^2$ B) $-42a^2 + 14b^2$

C) $-42a^2 + 37ab + 14b^2$ D) $-42a^2 + 61ab + 14b^2$

Answer: A

498) $(-8 + x)(3x - 1)$

A) $3x^2 - 25x + 8$ B) $x^2 - 25x - 25$ C) $3x^2 - 26x + 8$ D) $3x^2 + 8x - 25$

Answer: A

499) $(x - 3)(5x + 7)$

A) $5x^2 - 10x - 21$ B) $5x^2 - 8x - 21$ C) $5x^2 - 21x - 8$ D) $5x^2 - 8x - 8$

Answer: B

500) $\left(2x + \frac{1}{6}\right)\left(11x - \frac{1}{3}\right)$

A) $22x^2 + \frac{7}{6}x - \frac{1}{18}$ B) $22x^2 + \frac{7}{6}x + \frac{1}{18}$ C) $22x^2 - \frac{5}{2}x - \frac{1}{18}$ D) $22x^2 - \frac{7}{6}x + \frac{1}{18}$

Answer: A

501) $(10p - 1)(100p^2 + 10p + 1)$

A) $1000p^3 - 1$ B) $1000p^3 + 1$ C) $1000p^3 + 110p^2 - 1$ D) $100p^3 - 1$

Answer: A

502) $(9y - 8)(81y^2 + 72y + 64)$

A) $729y^3 - 512$ B) $729y^3 + 512$

C) $81y^3 + 512$ D) $729y^3 + 576y^2 - 512$

Answer: A

503) $(4x^2 - 3x + 4)(x^2 - 2x + 5)$

A) $4x^4 - 11x^3 + 26x^2 - 23x + 20$ B) $4x^4 - 11x^3 + 30x^2 - 23x + 20$

C) $4x^4 - 8x^3 + 30x^2 - 23x + 20$ D) $4x^4 - 8x^3 + 26x^2 - 23x + 20$

Answer: B

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504) $(4y^2 + 4y + 5)(y^2 - 3y - 1)$

A) $4y^4 - 8y^3 - 11y^2 - 19y - 5$

B) $4y^4 - 12y^3 - 16y^2 - 19y - 5$

C) $4y^4 - 12y^3 - 11y^2 - 19y - 5$

D) $4y^4 - 8y^3 - 16y^2 - 19y - 5$

Answer: A

505) $(3y - 4)(2y^3 - 2y^2 + 2y + 4)$

A) $6y^4 - 14y^3 - 2y^2 + 4y - 16$

B) $6y^4 + 2y^3 + 14y^2 + 4y - 16$

C) $6y^4 - 14y^3 + 14y^2 + 4y - 16$

D) $6y^4 - 14y^3 + 14y^2 + 12y - 16$

Answer: C

506) $(4x^3 - x^2 + 3x - 1) (2x + 2)$

A) $7x^4 + 10x^3 + 6x^2 + 6x - 4$

B) $8x^3 + 6x^2 + 4x + 4$

C) $8x^4 + 6x^3 + 4x^2 + 4x - 2$

D) $9x^4 - 6x^3 + 3x^2 - 4x + 2$

Answer: C

507) $3x(4x - 1)(3x + 6)$

A) $12x^3 + 21x^2 - 6x$

B) $34x^2 + 64x - 18$

C) $36x^3 + 63x^2 - 18x$

D) $32x^3 + 65x^2 - 16x$

Answer: C

508) $(4x + 9y)(-3x - 7y + 1)$

A) $-12x^2 - 27xy + 4x - 63y^2 + 9y$

B) $-12x^2 - 28xy + 4x - 63y^2$

C) $-12x^2 - 55xy - 55y^2$

D) $-12x^2 - 55xy + 4x - 63y^2 + 9y$

Answer: D

509) $(-3x^2 - 2y)(2x^2 - 3y + z)$

A) $-6x^4 + 5x^2y - 3x^2z + 6y^2 - 2yz$

B) $-6x^4 + 5x^2y^2 + 6y^2$

C) $-6x^2 + 5xy - 3x^2z + 6y^2 - 2z$

D) $-6x^4 + 5x^2y + 6y^4 - 3x^2yz$

Answer: A

510) $(4x + 2y + 8)(4x + 2y - 8)$

A) $16xy - 32x + 16y - 64$

B) $16x^2 - 16xy - 4y^2 - 128$

C) $16x^2 + 16xy + 4y^2 - 64$

D) $8x^2 + 4y^2 - 128$

Answer: C

511) $n^2\left(2n - \frac{1}{10}\right)\left(11n + \frac{1}{5}\right)$

A) $22n^4 - \frac{7}{10}n^3 - \frac{1}{50}n^2$

B) $22n^4 + \frac{7}{10}n^3 - \frac{1}{50}n^2$

C) $22n^4 - \frac{7}{10}n^3 + \frac{1}{50}n^2$

D) $22n^4 - \frac{3}{2}n^3 - \frac{1}{50}n^2$

Answer: A

512) $(x - 7)(x + 7)(x^2 + 49)$

A) $x^4 - 49$

B) $x^4 - 2401$

C) $x^4 - 14x^2 - 49$

D) $x^4 - 196x^2 + 2401$

Answer: B

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513) $(n - 4)(n - 4)(n + 4)(n + 4)$

A) $n^4 + 32n - 256$ B) $n^4 - 32n + 256$ C) $n^4 - 32n^2 + 256$ D) $n^4 + 32n^2 - 256$

Answer: C

514) $(a - 4)(a + 4)$

A) $a^2 - 16$ B) $a^2 - 8$ C) $a^2 + 8a - 16$ D) $a^2 - 8a - 16$

Answer: A

515) $(m + 3)(m - 3)$

A) $m^2 - 6m - 9$ B) $m^2 - 6m + 9$ C) $m^2 - 6$ D) $m^2 - 9$

Answer: D

516) $(n - 10)(n + 10)$

A) $n^2 - 100$ B) $n^2 - 20n + 100$ C) $n^2 - 20$ D) $n^2 - 20n - 100$

Answer: A

517) $(13p + 10)(13p - 10)$

A) $169p^2 + 260p - 100$ B) $169p^2 - 260p - 100$ C) $169p^2 - 100$ D) $p^2 - 100$

Answer: C

518) $(6r - 11)(6r + 11)$

A) $36r^2 - 121$ B) $36r^2 - 132r - 121$ C) $6r^2 - 121$ D) $36 + 132r - 121r^2$

Answer: A

519) $(p + 13q)(p - 13q)$

A) $p^2 + 26pq - 169q^2$ B) $p^2 - 26q^2$ C) $p^2 - 169q^2$ D) $p^2 - 26pq - 169q^2$

Answer: C

520) $(9y + x)(9y - x)$

A) $81y^2 - 18xy - x^2$ B) $81y^2 + 18xy - x^2$ C) $81y^2 - x^2$ D) $18y^2 - x^2$

Answer: C

521) $(3a + 8c)(3a - 8c)$

A) $3a^2 - 8c^2$ B) $9a^2 - 64c^2$ C) $9a^2 + 48ac - 64c^2$ D) $9a^2 - 48ac - 64c^2$

Answer: B

522) $(3m - 13w)(3m + 13w)$

A) $9m^2 + 78mw - 169w^2$ B) $9m^2 - 78mw - 169w^2$

C) $3m^2 - 13w^2$ D) $9m^2 - 169w^2$

Answer: D

523) $[(2x - y) + 3z][(2x - y) - 3z]$

A) $4x^2 - 4xy + y^2 - 9z^2$ B) $4x^2 + y^2 + 12xz + 6yz - 9z^2$

C) $4x^2 + y^2 - 9z^2$ D) $4x^2 - 4xy + y^2 + 12xz + 6yz - 9z^2$

Answer: A

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524) $(n + 15)^2$

A) $n + 225$ B) $n^2 + 225$ C) $n^2 + 30n + 225$ D) $225n^2 + 30n + 225$

Answer: C

525) $(p + 8)^2$

A) $64p^2 + 16p + 64$ B) $p^2 + 16p + 64$ C) $p + 64$ D) $p^2 + 64$

Answer: B

526) $(w - 15)^2$

A) $225w^2 - 30w + 225$ B) $w^2 - 30w + 225$ C) $w + 225$ D) $w^2 + 225$

Answer: B

527) $(r - 14)^2$

A) $196r^2 - 28r + 196$ B) $r + 196$ C) $r^2 + 196$ D) $r^2 - 28r + 196$

Answer: D

528) $(6m + 11)^2$

A) $6m^2 + 132m + 121$ B) $36m^2 + 132m + 121$ C) $6m^2 + 121$ D) $36m^2 + 121$

Answer: B

529) $(10a - 11)^2$

A) $10a^2 + 121$ B) $100a^2 + 121$ C) $10a^2 - 220a + 121$ D) $100a^2 - 220a + 121$

Answer: D

530) $(-7x - 1)^2$

A) $-7x^2 + 1$ B) $-7x^2 + 14x + 1$ C) $49x^2 + 14x + 1$ D) $49x^2 + 1$

Answer: C

531) $(9x + 5y)^2$

A) $81x^2 + 90xy + 25y^2$ B) $9x^2 + 90xy + 25y^2$ C) $81x^2 + 25y^2$ D) $9x^2 + 25y^2$

Answer: A

532) $(9x - 11y)^2$

A) $81x^2 + 121y^2$ B) $9x^2 - 198xy + 121y^2$

C) $81x^2 - 198xy + 121y^2$ D) $9x^2 + 121y^2$

Answer: C

533) $[(5x + 5) + 3y]^2$

A) $25x^2 + 50x + 25 + 30xy + 30y + 9y^2$ B) $25x^2 + 25x + 25 + 15xy + 15y + 9y^2$

C) $25x^2 + 50x + 30xy + 30y + 9y^2$ D) $25x^2 + 30xy + 9y^2$

Answer: A

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534) $[(2x - 3) + 6y]^2$

A) $4x^2 - 12x + 9 + 12xy + 18y + 36y^2$
B) $4x^2 - 6x + 9 + 12xy + 18y + 36y^2$
C) $4x^2 - 12x + 24xy - 36y + 36y^2$
D) $4x^2 - 12x + 9 + 24xy - 36y + 36y^2$

Answer: D

535) $(x + 2y)^3$

A) $3(x + 2y)$
B) $x^3 + 8y^3$
C) $x^3 + 2x^2y + 4xy + 4xy^2 + 8y^2 + 8y^3$
D) $x^3 + 6x^2y + 12xy^2 + 8y^3$

Answer: D

536) $(5x + 4)^3$

A) $125x^3 + 300x^2 + 300x + 64$
B) $25x^6 + 20x^3 + 4096$
C) $25x^2 + 40x + 16$
D) $125x^3 + 300x^2 + 240x + 64$

Answer: D

537) $(5x + 2)^4$

A) $(25x^2 + 10x + 4)^4$
B) $1250x^4 + 2000x^3 + 600x^2 + 320x + 16$
C) $625x^4 + 1000x^3 + 600x^2 + 160x + 16$
D) $625x^3 + 1000x^2 + 600x + 160$

Answer: C

Divide.

538) $\dfrac{15x^7 - 30x^5}{5x^3}$

A) $3x^4 - 6x^2$
B) $3x^4 - 30x^5$
C) $-3x^9$
D) $15x^7 - 6x^2$

Answer: A

539) $\dfrac{12x^8 - 18x^4}{-6x^8}$

A) $-2 - 18x^4$
B) $-2 + \dfrac{3}{x^4}$
C) $-2 + 3x^4$
D) $12x^8 + \dfrac{3}{x^4}$

Answer: B

540) $\dfrac{-25x^7 - 10x^6 - 30x^5}{-5x^6}$

A) $5x + 2$
B) $5x - 10x^6 + \dfrac{6}{x}$
C) $11x + 2$
D) $5x + 2 + \dfrac{6}{x}$

Answer: D

541) $\dfrac{15x^5 - 24x^4 + 9x^3}{3x^4}$

A) $5x - 8 + \dfrac{3}{x}$
B) $8x - 8$
C) $5x - 24x^4 + \dfrac{3}{x}$
D) $5x - 8$

Answer: A

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542) $\frac{12x^7 + 18x^5 + 15x^3}{3x^5}$

A) $4x + 6 + \frac{5}{x^2}$ B) $4x^2 + 6 + \frac{5}{x^2}$ C) $4x^2 + 6 + \frac{5}{x}$ D) $4x + 6 + \frac{5}{x}$

Answer: B

543) $\frac{64st^3 - 10t^4 + 256st^2}{8st^2}$

A) $8t - \frac{t^2}{s} + 32$ B) $8t - \frac{5t^2}{4s} + 32$ C) $8st - \frac{5t^2}{4s} + 32$ D) $8t - st^2 + 32$

Answer: B

544) $\frac{x^2 + 11x + 30}{x + 5}$

A) $x^3 - 25$ B) $x - 25$ C) $x^2 + 6$ D) $x + 6$

Answer: D

545) $\frac{x^2 + 2x - 8}{x + 4}$

A) $x^2 + 3x - 4$ B) $x^2 - 2$ C) $x + 2$ D) $x - 2$

Answer: D

546) $\frac{4m^2 + 12m - 16}{m + 4}$

A) $4m - 4 + \frac{9}{m - 4}$ B) $m - 4$ C) $4m - 4$ D) $4m + 4$

Answer: C

547) $\frac{y^2 + 14y + 49}{y + 7}$

A) $y - 7$ B) $y^2 + 7$ C) $y + \frac{7}{y + 7}$ D) $y + 7$

Answer: D

548) $\frac{x^2 + 7x + 5}{x + 3}$

A) $\frac{x + 4}{x + 3}$ B) $x + 4 + \frac{7}{x + 3}$ C) $x + 4 - \frac{7}{x + 3}$ D) $x + 5$

Answer: C

549) $\frac{x^2 - 12x + 27}{x - 9}$

A) $x + 3$ B) $x + 9$ C) $3 - x$ D) $x - 3$

Answer: D

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550) $\frac{12x^3 + 11x^2 + 22x + 5}{4x + 1}$

A) $3x^2 + 2x + 5$ B) $3x^2 + 5$ C) $x^2 - 2x - 5$ D) $x^2 + 2x + 5$

Answer: A

551) $\frac{16y^4 + 20y^3 + 5y - 1}{4y^2 + 1}$

A) $4y^2 + 5y - 1$ B) $4y^2 + 5y$ C) $4y^2 - 5y + 1$ D) $4y^2 - 1$

Answer: A

552) $\frac{x^4 + 3x^2 + 4}{x^2 + 1}$

A) $x^2 + 2x + \frac{1}{2}$ B) $x^2 + 2 + \frac{2}{x^2 + 1}$ C) $x^2 + 2x + 2$ D) $x^2 + 2$

Answer: B

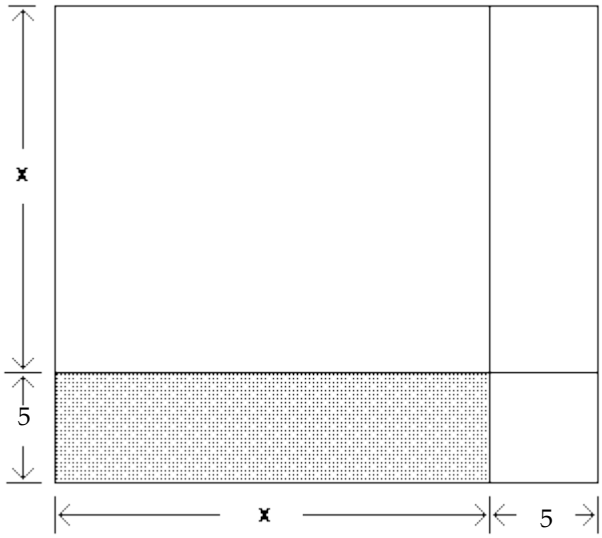
553) $\frac{25y^4 + 30y^3 + 6y - 1}{5y^2 + 1}$

A) $5y^2 - 1$ B) $5y^2 + 6y$ C) $5y^2 + 6y - 1$ D) $5y^2 - 6y + 1$

Answer: C

Provide an appropriate response.

554) Consider the following figure, which is a square divided into two squares and two rectangles.



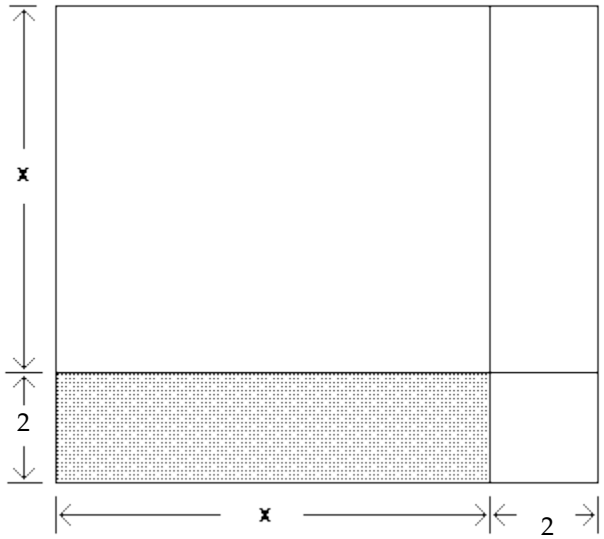
The length of each side of the large square is x + 5. Use the formula for the area of a square to write the area of the largest square as a power.

A) $x^2 - 5^2$ B) $x^2 + 5^2$ C) $(x + 5)^2$ D) $(x - 5)^2$

Answer: C

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555) Consider the following figure, which is a square divided into two squares and two rectangles.

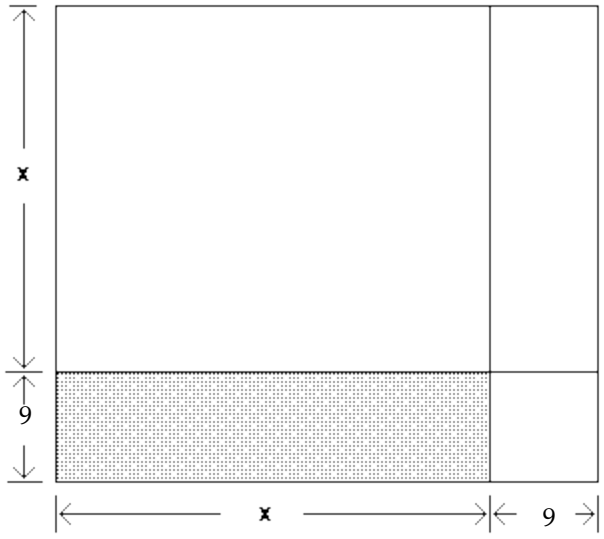


The length of each side of the large square is x + 2. Find a formula for the area of the largest square as a binomial raised to a power. Write the expansion of this binomial.

A) $x^2 - 4x + 4$ B) $x^2 + 4$ C) $x^2 + 4x + 4$ D) $x^2 - 4$

Answer: C

556) Consider the following figure, which is a square divided into two squares and two rectangles.



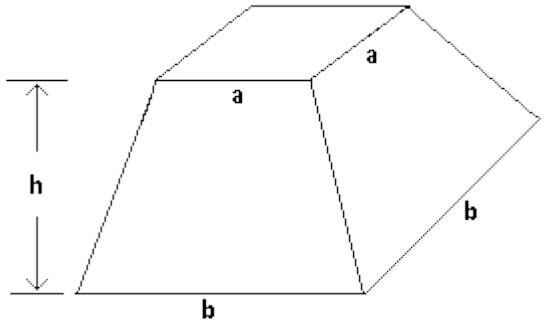
The length of each side of the large square is x + 9, which means that the area of the largest square is $(x + 9)^2$. Use the formulas for the area of a square and the area of a rectangle to write the area of the largest square as a trinomial that represents the sum of the areas of the four figures that comprise it.

A) $x^2 + x + 81$ B) $x^2 - 2x + 81$ C) $x^2 + 9x + 81$ D) $x^2 + 18x + 81$

Answer: D

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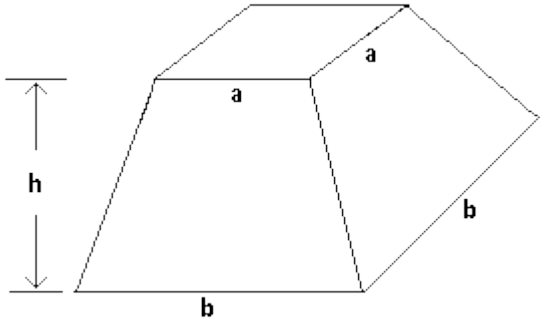
557) The formula used to find the volume of the frustum of a square pyramid is $V = \frac{1}{3} h (a^2 + ab + b^2)$, where b is the length of the base, a is the length of the top, and h is the height. Calculate the volume if a = 232 feet , b = 604 feet , and h = 222 feet.



A) 41,349,832 cubic feet
B) 41,358,832 cubic feet
C) 41,348,832 cubic feet
D) 124,046,496 cubic feet

Answer: C

558) The formula used to find the volume of the frustum of a square pyramid is $V = \frac{1}{3} h (a^2 + ab + b^2)$, where b is the length of the base, a is the length of the top, and h is the height. Try to visualize the figure if a = b = h. Calculate the volume if a = 238 feet, b = 238 feet, and h = 238 feet.

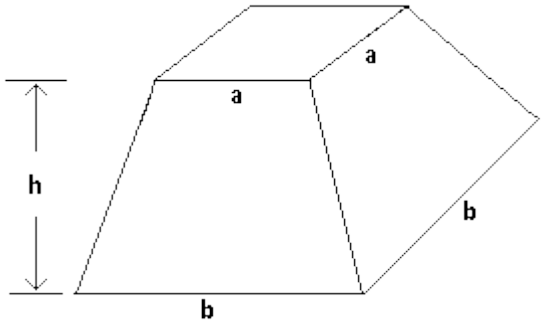


A) 13,481,272 cubic feet
B) 13,481,372 cubic feet
C) 13,482,272 cubic feet
D) 56,644 cubic feet

Answer: A

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559) The formula used to find the volume of the frustum of a square pyramid is $V = \frac{1}{3} h (a^2 + ab + b^2)$, where b is the length of the base, a is the length of the top, and h is the height. Visualize the figure if a = b = h. What would the figure be?



A) A cylinder B) A cone C) A cube D) A sphere

Answer: C

560) The number of farms in a certain country since 1940, in millions, can be approximated by evaluating the polynomial $0.000026045689x^3 - 0.1522580959x^2 + 296.5669762x - 192{,}464.713$, where x is the year in question. Evaluate the polynomial for x = 2010 to determine the number of farms in 2010. Round the answer to the nearest million farms.

A) 7 million farms B) 4 million farms C) 3 million farms D) 6 million farms

Answer: B

Factor out the greatest common factor. Simplify the factors, if possible.

561) $4x^3 + 20x$

A) $4x(x^2 + 16x)$ B) $4x^2(x + 5)$ C) $4x(x^2 + 5)$ D) $4x(x^2 + 5x)$

Answer: C

562) $5t^2 - 10t - 25$

A) $5(t^2 - 5t - 20)$ B) $5t(t^2 - 2t - 5)$ C) $5(t^2 - 2t - 5)$ D) $5(t^2 - 10t - 25)$

Answer: C

563) $12wx - 20wy - 8wz$

A) $4w(3x - 5y - 2z)$ B) $4(3wx - 5wy - 2wz)$

C) $12w(x - 20y - 8z)$ D) $4w(3x - 20wy - 8wz)$

Answer: A

564) $28x^9y^8 - 20x^4y^6 + 28x^7y^3$

A) $x^4y^3(28x^5y^5 - 20y^3 + 28x^3)$ B) $4(7x^9y^8 - 5x^4y^6 + 7x^7y^3)$

C) $4x^4(7x^5y^8 - 5y^6 + 7x^3y^3)$ D) $4x^4y^3(7x^5y^5 - 5y^3 + 7x^3)$

Answer: D

565) $5x(3x - 2) - 4(3x - 2)$

A) $(15x + 4)(x + 2)$ B) $(15x - 4)(x - 2)$ C) $(5x + 4)(3x + 2)$ D) $(5x - 4)(3x - 2)$

Answer: D

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566) $t(2 - m) + s(2 - m)$

A) $(t + s)(2 - m)$ B) $t(2 - m) + s$ C) $(t + s)(2 + m)$ D) $(t - s)(2 - m)$

Answer: A

567) $2m(3 - m) + 3n(3 - m)$

A) $(2m - 3n)(3 - m)$ B) $2(m + n)(3 - m)$ C) $(2m + 3n)(3 - m)$ D) $m(2 + 3n)(3 - m)$

Answer: C

568) $(x - 5)(x + 7) + (x - 5)(x + 7)$

A) $2(x - 5)(x + 7)$ B) $(x - 5)(x + 14)$ C) $2(x - 5)(2x + 14)$ D) $(x - 5)(2x + 14)$

Answer: A

Factor by grouping.

569) $10x^2 - 15x - 12x + 18$

A) $(5x + 6)(2x + 3)$ B) $(10x + 6)(x + 3)$ C) $(10x - 6)(x - 3)$ D) $(5x - 6)(2x - 3)$

Answer: D

570) $10x^2 + 15xy + 12xy + 18y^2$

A) $(10x + 6y)(x + 3y)$ B) $(5x + 6)(2x + 3)$ C) $(5x + 6y)(2x + 3y)$ D) $(5x - 6y)(2x + 3y)$

Answer: C

571) $10a^3 - 6a^2b + 25ab^2 - 15b^3$

A) $(2a^2 + 5b)(5a - 3b)$ B) $(2a^2 + 5b^2)(5a - 3b)$

C) $(10a^2 + 5b^2)(a - 3b)$ D) $(2a^2 - 5b^2)(5a + 3b)$

Answer: B

572) $12x^6 + 9x^3y^2 - 16x^3y^2 - 12y^4$

A) $(3x^3 + 4y^2)(4x^3 - 3y^2)$ B) $(3x^3 - 4y^2)(4x^3 + 3y^2)$

C) $(12x^3 - 4y^2)(x^3 + 3y^2)$ D) $(3x^3 - 4y)(4x^3 + 3y^4)$

Answer: B

573) $15x^2 - 18x - 20x + 24$

A) $(3x - 4)(5x - 6)$ B) $(15x + 4)(x + 6)$ C) $(15x - 4)(x - 6)$ D) $(3x + 4)(5x + 6)$

Answer: A

574) $12x^4 + 8x^2 - 15x^2 - 10$

A) $(4x^2 - 5)(3x^2 + 2)$ B) $(4x^2 + 5)(3x^2 - 2)$ C) $(12x^2 + 5)(x^2 - 2)$ D) $(4x^4 - 5)(3x + 2)$

Answer: A

575) $15x^6 + 10x^3 - 9x^3 - 6$

A) $(5x^3 - 3)(3x^3 + 2)$ B) $(5x^6 - 3)(3x + 2)$ C) $(15x^3 + 3)(x^3 - 2)$ D) $(5x^3 + 3)(3x^3 - 2)$

Answer: A

576) $20x^2 + 15xy + 8xy + 6y^2$

A) $(5x + 2y)(4x + 3y)$ B) $(5x - 2y)(4x + 3y)$ C) $(5x + 2)(4x + 3)$ D) $(20x + 2y)(x + 3y)$

Answer: A

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577) $x^3 - 2x^2 + 9x - 18$

A) $(x + 9)(x^2 - 2x)(x - 2)$ B) $(x^2 + 9)(x - 2)$

C) $x(x^2 - 2x + 9) - 18$ D) $(x^2 - 2x) + 9(x - 2)$

Answer: B

Factor the trinomial, if possible.

578) $x^2 - x - 12$

A) $(x + 4)(x - 3)$ B) $(x + 3)(x - 4)$ C) $(x + 1)(x - 7)$ D) $(x - 4)(x + 4)$

Answer: B

579) $x^2 - x - 40$

A) $(x - 40)(x + 1)$ B) $(x + 5)(x - 8)$ C) $(x - 5)(x + 8)$ D) prime

Answer: D

580) $x^2 + 5xy - 14y^2$

A) $(x - 7y)(x + y)$ B) $(x - 7y)(x + 2y)$ C) $(x - y)(x + 2y)$ D) $(x + 7y)(x - 2y)$

Answer: D

581) $u^2 - 2uv - 35v^2$

A) $(u - 5v)(u + v)$ B) $(u - 5v)(u + 7v)$ C) $(u + 5v)(u - 7v)$ D) $(u - v)(u + 7v)$

Answer: C

582) $u^2 - 5uv - 50v^2$

A) $(u + 5v)(u - 10v)$ B) $(u - 5v)(u + v)$ C) $(u - 5v)(u + 10v)$ D) prime

Answer: A

583) $x^2 + 4xy - 165y^2$

A) $(x - 15y)(x + y)$ B) prime C) $(x + 15y)(x - 11y)$ D) $(x - 15y)(x + 11y)$

Answer: C

584) $4x^2 - 12xy - 16y^2$

A) $4(x + y)(x - 4y)$ B) $(x - y)(4x + 12y)$ C) $4(x - y)(x + 4y)$ D) $(4x - 4y)(x + 4y)$

Answer: A

585) $2x^2 - 12x + 16$

A) $(2x - 4)(x - 4)$ B) $(x - 2)(2x - 8)$ C) $2(x - 8)(x + 1)$ D) $2(x - 2)(x - 4)$

Answer: D

586) $5x^3 + 15x^2y - 50xy^2$

A) $(x - 2y)(5x^2 + 25xy)$ B) $5x(x - 2y)(x + 5y)$ C) $5x(x + 2y)(x - 5y)$ D) $(5x^2 + 10xy)(x - 5y)$

Answer: B

587) $5x^3 + 10x^2 - 40x$

A) $(x - 2)(5x^2 + 20)$ B) $5x(x + 2)(x - 4)$ C) $5x(x - 2)(x + 4)$ D) $(5x^2 + 10x)(x - 4)$

Answer: C

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588) $27x^2 - 117x - 90$

A) $(27x + 18)(x - 5)$ B) $9(3x + 2)(x - 5)$ C) $9(3x - 2)(x + 5)$ D) $(3x + 2)(9x - 45)$

Answer: B

589) $4x^2 - 14x - 8$

A) $(2x - 1)(2x + 8)$ B) $2(2x + 1)(x - 4)$ C) $(4x - 2)(x + 4)$ D) $2(2x - 1)(x + 4)$

Answer: B

590) $-18x^2 - 15x + 18$

A) $3(3x + 2)(-2x + 3)$ B) $(-9x + 6)(2x + 3)$ C) $(-3x + 2)(6x + 9)$ D) $-3(3x - 2)(2x + 3)$

Answer: D

591) $84x^2 + 49xy + 7y^2$

A) $7(3x - y)(4x - y)$ B) $7(3x + y)(4x + y)$ C) $(3x + y)(7x + 3y)$ D) $(21x + 7y)(4x + y)$

Answer: B

592) $-2x^3 - 8x^2 + 24x$

A) $-2x(x - 2)(x + 6)$ B) $2x(x + 2)(x + 6)$ C) $-2x(x + 2)(x - 6)$ D) $-2x^2(x - 2)(x - 6)$

Answer: A

593) $-2x^2 - 8x + 24$

A) $-2(x + 2)(x + 6)$ B) $2(x - 2)(x + 6)$ C) $-2(x - 2)(x + 6)$ D) $-2(x + 2)(x - 6)$

Answer: C

594) $15x^2 + 22x + 8$

A) $(3x - 2)(5x - 4)$ B) $(15x + 1)(x + 8)$ C) $(15x + 2)(x + 4)$ D) $(3x + 2)(5x + 4)$

Answer: D

595) $15y^2 + 26y + 8$

A) $(3y - 4)(5y - 2)$ B) $(3y + 4)(5y + 2)$ C) $(15y + 1)(y - 8)$ D) $(15y + 4)(y + 2)$

Answer: B

596) $7x^2 - 3x + 4$

A) prime B) $(7x - 1)(x + 4)$ C) $(7x + 4)(x - 1)$ D) $(7x - 4)(x + 1)$

Answer: A

597) $20z^2 + 7z - 6$

A) $(4z - 3)(5z + 2)$ B) $(20z + 1)(z - 6)$ C) $(20z + 3)(z - 2)$ D) $(4z + 3)(5z - 2)$

Answer: D

598) $9z^2 + 6z - 8$

A) $(9z - 2)(z - 8)$ B) $(3z - 2)(3z + 4)$ C) $(3z + 2)(3z - 4)$ D) $(9z - 2)(z + 4)$

Answer: B

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599) $14m^2 + 61mn + 42n^2$

A) $(2m + 7n)(7m + 6n)$ B) $(2m + 7n^2)(7m + 6)$ C) $(2m - 7n)(7m - 6n)$ D) $(2m + 6n)(7m + 7n)$

Answer: A

600) $6x^2 + 7xy + y^2$

A) $(6x + y)(x + 6y)$ B) $(6x - y)(x - y)$ C) prime D) $(6x + y)(x + y)$

Answer: D

601) $7x^2 - 39xy - 18y^2$

A) $y(7x + 3)(x - 6)$ B) $(7x + 6y)(x - 3y)$ C) prime D) $(7x + 3y)(x - 6y)$

Answer: D

602) $6x^2 - 17xy + 12y^2$

A) prime B) $(2x - 3y)(3x - 4y)$ C) $(2x + 3y)(3x + 4y)$ D) $(6x - 3y)(x - 4y)$

Answer: B

603) $49m^2 - 112m + 64$

A) $(7m + 8)(7m - 8)$ B) $(7m - 8)^2$ C) $(7m + 8)^2$ D) $(7m - 9)^2$

Answer: B

604) $9m^2 + 12m + 4$

A) $(3m + 2)(3m - 2)$ B) $(3m - 2)^2$ C) $(3m - 3)^2$ D) $(3m + 2)^2$

Answer: D

605) $25m^2 + 50m + 25$

A) $25(m + 1)^2$ B) $(5m - 2)^2$ C) $25(m - 1)^2$ D) $(5m + 2)^2$

Answer: A

606) $64m^2 - 224mn + 196n^2$

A) $4(4m + 7n)^2$ B) $(16m - 28n)^2$ C) $4(4m - 7n)^2$ D) $(16m + 7n)^2$

Answer: C

607) $75m^2 + 180mn + 108n^2$

A) $3(5m - 6n)^2$ B) $(15m + 18n)^2$ C) $3(5m + 6n)^2$ D) $(15m - 3n)^2$

Answer: C

608) $4a^2 + 8ab + 4b^2$

A) $4(a + b)^2$ B) $4(a - b)^2$ C) $(2a - 2b)^2$ D) $(2a + 2b)^2$

Answer: A

609) $(m - 2n)^2 - 10(m - 2n) + 25$

A) $(m - 2n + 5)(m + 2n - 5)$ B) $(m - 2n - 5)^2$

C) $(m - 2n)^2$ D) $(m + 2n + 5)^2$

Answer: B

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610) $(m + 3n)^2 - 4(m + 3n) + 4$

A) $(m + 3n + 2)^2$ B) $(m + 3n - 2)^2$ C) $(m - n - 6)^2$ D) $(m - 3n - 2)^2$

Answer: B

611) $(x + 3y)^2 + 4(x + 3y) + 4$

A) $(x - 3y + 2)^2$ B) $(x + 3y - 2)(x - 3y + 2)$

C) $(x + 3y + 2)^2$ D) $(x + 3y - 2)^2$

Answer: C

612) $(x - 2y)^2 + 4(x - 2y) + 4$

A) $(x + 2y + 2)^2$ B) $(x - 2y + 2)^2$

C) $(x + 2y - 2)(x - 2y + 2)$ D) $(x - 2y - 2)^2$

Answer: B

Factor by any method.

613) $6x^2 + 4x + 15x + 10$

A) $(6x + 5)(x + 2)$ B) $(2x + 5)(3x + 2)$ C) $(2x - 5)(3x - 2)$ D) $(6x - 5)(x - 2)$

Answer: B

614) $20x^2 + 15xy + 16xy + 12y^2$

A) $(5x - 4y)(4x + 3y)$ B) $(5x + 4)(4x + 3)$ C) $(20x + 4y)(x + 3y)$ D) $(5x + 4y)(4x + 3y)$

Answer: D

615) $15a^3 - 18a^2b + 20ab^2 - 24b^3$

A) $(3a^2 - 4b^2)(5a + 6b)$ B) $(3a^2 + 4b^2)(5a - 6b)$

C) $(15a^2 + 4b^2)(a - 6b)$ D) $(3a^2 + 4b)(5a - 6b)$

Answer: B

616) $15x^8 - 25x^4y^2 + 18x^4y^2 - 30y^4$

A) $(5x^4 - 6y^2)(3x^4 + 5y^2)$ B) $(5x^4 + 6y)(3x^4 - 5y^4)$

C) $(15x^4 + 6y^2)(x^4 - 5y^2)$ D) $(5x^4 + 6y^2)(3x^4 - 5y^2)$

Answer: D

617) $15x^4 + 29x^2 + 12$

A) $(5x^2 - 3)(3x^2 - 4)$ B) $(3x^2 + 4)(5x^2 + 3)$ C) $(15x^2 + 4)(x^2 + 3)$ D) $(3x^2 + 1)(5x^2 + 12)$

Answer: B

618) $15z^6 + 4z^3 - 4$

A) $15(z^3 - 2)(z^3 + 2)$ B) $(3z^3 + 1)(5z^3 - 4)$ C) $(3z^3 + 2)(5z^3 - 2)$ D) $(5z^3 + 2)(3z^3 - 2)$

Answer: C

619) $15z^4 - 14z^2 - 8$

A) $(3z^2 + 4)(5z^2 - 2)$ B) $(3z^4 + 4)(5z - 2)$ C) $(5z^2 + 2)(3z^2 - 4)$ D) $(5z^4 + 2)(3z - 4)$

Answer: C

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620) $10(m-3)^2 - 13(m-3) - 3$

A) $(2m+3)(5m+1)$ B) $(2m-9)(5m-14)$ C) $(2m+6)(5m+4)$ D) $(2m+7)(5m+18)$

Answer: B

621) $16x^2 + 8x + 1 - y^2$

A) prime B) $(4x-1+y)(4x-1-y)$

C) $(4x+1+y)(4x+1-y)$ D) $(4x+1+y)(4x-1-y)$

Answer: C

622) $(r+s)^2 + 4(r+s) + 4$

A) $(r+s+4)(r+s)$ B) $(r+s+2)(r+s-2)$ C) $(r+s+2)^2$ D) prime

Answer: C

Solve the problem.

623) Find all values of a that will make the polynomial a perfect square trinomial.

$16x^2 + ax + 36$

A) 24, –24 B) 48 C) 48, –48 D) 24

Answer: C

624) Find all values of b that will make the polynomial a perfect square trinomial.

$36x^2 + 24x + b$

A) 48 B) 3 C) 3, –3 D) 4

Answer: D

Factor by any method.

625) $y^2 - 4$

A) $(y-2)(y-2)$ B) $(y+4)(y-4)$ C) $(y^2+2)(y^2-2)$ D) $(y+2)(y-2)$

Answer: D

626) $y^2 - \frac{49}{121}$

A) $\left(y+\frac{49}{11}\right)\left(y-\frac{49}{11}\right)$ B) $\left(y+\frac{7}{11}\right)\left(y-\frac{7}{11}\right)$ C) $\left(y^2+\frac{7}{11}\right)\left(y^2-\frac{7}{11}\right)$ D) $\left(y-\frac{7}{11}\right)\left(y-\frac{7}{11}\right)$

Answer: B

627) $36x^2 - 36y^2$

A) $36(x-y)^2$ B) $(6x+y)(6x-y)$ C) $6(x+y)(x-y)$ D) $36(x+y)(x-y)$

Answer: D

628) $64x^2 - 81$

A) $(64x+1)(x-81)$ B) $(8x+9)(8x-9)$ C) $(8x-9)^2$ D) $(8x+9)^2$

Answer: B

629) $64a^3 - 25a$

A) $a(8a+5)(8a-5)$ B) $a(8a-5)^2$ C) $a(64a+1)(a-25)$ D) $(8a^2+5)(8a-5)$

Answer: A

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630) $4k^2 - 25m^2$

A) $(4k + m)(k - 25m)$ B) $(2k + 5m)^2$ C) $(2k + 5m)(2k - 5m)$ D) $(2k - 5m)^2$

Answer: C

631) $100x^4 - 256$

A) $4(25x^4 - 64)$ B) $4(5x^2 - 8)^2$ C) $(20x^2 - 32)(5x^2 + 8)$ D) $4(5x^2 - 8)(5x^2 + 8)$

Answer: D

632) $(q - 3)^2 - 49$

A) $(q + 4)(q - 10)$ B) $[(q - 3)^2 + 7][(q - 3)^2 - 7]$

C) $(q + 4)^2$ D) $(q + 10)(q - 10)$

Answer: A

633) $(r + s)^2 - 16$

A) $(r + s + 4)(r - s - 4)$ B) $(r^2 + 4)(s^2 - 4)$ C) $(r + s + 4)(r + s - 4)$ D) $(r - s + 4)(r - s - 4)$

Answer: C

634) $(5x + 1)^2 - y^2$

A) $(5x - 1 + y)(5x - 1 - y)$ B) $(5x + 1 + y)(5x - 1 - y)$

C) prime D) $(5x + 1 + y)(5x + 1 - y)$

Answer: D

635) $216p^3 - 1$

A) $(216p - 1)(p^2 + 6p + 1)$ B) $(6p - 1)(36p^2 + 1)$

C) $(6p + 1)(36p^2 - 6p + 1)$ D) $(6p - 1)(36p^2 + 6p + 1)$

Answer: D

636) $x^3 - 64$

A) $(x - 4)(x^2 + 16)$ B) $(x + 64)(x^2 - 1)$ C) $(x - 4)(x^2 + 4x + 16)$ D) $(x + 4)(x^2 - 4x + 16)$

Answer: C

637) $64a^3 - 125b^3$

A) $(4a - 5b)(16a^2 + 25b^2)$ B) $(4a + 5b^2)(16a^2 - 20ab + 25b^2)$

C) $(64a - 5b)(a^2 + 20ab + 25b^2)$ D) $(4a - 5b)(16a^2 + 20ab + 25b^2)$

Answer: D

638) $128k^3m - 54m^4$

A) $2m(4k - 3m)(16k^2 + 12km + 9m^2)$ B) $2m(4k + 3m^2)(16k^2 - 12km + 9km^2)$

C) $(8km - 6m^2)(16k^2 + 9m^2)$ D) $2m(64k - 3m)(k^2 + 12km + 9m^2)$

Answer: A

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639) $512s^3 + 1$

A) $(8s - 1)(64s^2 + 8s + 1)$ B) $(512s + 1)(s^2 - 8s + 1)$

C) $(8s + 1)(64s^2 + 1)$ D) $(8s + 1)(64s^2 - 8s + 1)$

Answer: D

640) $t^3 + 512$

A) $(t + 8)(t^2 - 8t + 64)$ B) $(t - 8)(t^2 + 8t + 64)$ C) $(t - 512)(t^2 - 1)$ D) $(t + 8)(t^2 + 64)$

Answer: A

641) $125c^3 + 27$

A) $(5c + 3)(25c^2 - 15c + 9)$ B) $(125c + 3)(c^2 - 15c + 9)$

C) $(5c + 3)(25c^2 + 9)$ D) $(5c - 3)(25c^2 + 15c + 9)$

Answer: A

642) $x^6 + 1$

A) $(x + 1)(x - 1)(x^2 + x + 1)(x^2 - x + 1)$ B) $(x^3 + 1)(x^3 - 1)$

C) $(x + 1)(x - 1)(x^4 - x^2 + 1)$ D) $(x^2 + 1)(x^4 - x^2 + 1)$

Answer: D

643) $z^6 - 1$

A) $(z^2 + 1)(z^4 - z^2 + 1)$ B) $(z + 1)(z - 1)(z^2 + z + 1)(z^2 - z + 1)$

C) $(z + 1)(z - 1)(z^4 + z^2 + 1)$ D) $(z^3 + 1)(z^3 - 1)$

Answer: B

644) $x^6 - 64z^6$

A) $(x + 2z)(x - 2z)(x^2 + 2xz + 4z^2)(x^2 - 2xz + 4z^2)$ B) $(x + 2z)(x - 2z)(x^4 + 4x^2z^2 + 16z^4)$

C) $(x^2 - 4z^2)(x^4 + 4x^2z^2 + 16z^4)$ D) $(x^3 + 8z^3)(x^3 - 8z^3)$

Answer: A

Factor the polynomial by substitution.

645) $8x^4 + 18x^2 + 9$

A) $(8x^2 + 3)(x^2 + 3)$ B) $(4x^2 - 3)(2x^2 - 3)$ C) $(4x^2 + 1)(2x^2 + 9)$ D) $(4x^2 + 3)(2x^2 + 3)$

Answer: D

646) $12y^4 - 11y^2 - 15$

A) $(3y^2 + 1)(4y^2 - 15)$ B) $(4y - 3)(3y + 5)$ C) $(3y^2 - 5)(4y^2 + 3)$ D) $(12y^2 - 5)(y^2 + 3)$

Answer: C

647) $9z^6 + 6z^3 - 8$

A) $9(z^3 - 2)(z^3 + 4)$ B) $(3z^3 + 1)(3z^3 - 8)$ C) $(3z^3 + 2)(3z^3 - 4)$ D) $(3z^3 + 4)(3z^3 - 2)$

Answer: D

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648) $10z^4 - 7z^2 - 12$

A) $(5z^4 + 4)(2z - 3)$ B) $(2z^4 + 3)(5z - 4)$ C) $(5z^2 + 4)(2z^2 - 3)$ D) $(2z^2 + 3)(5z^2 - 4)$

Answer: C

649) $8z^6 + 16z^4 + 6z^2$

A) $2z^2(2z^2 + 1)(2z^2 + 3)$ B) $(4z^3 + 2)(2z^3 + 3)$

C) $2z^2(2z^2 - 3)(2z^2 - 1)$ D) $2(2z^4 + 1)(2z^2 + 3)$

Answer: A

650) $60z^8 + 88z^5 + 32z^2$

A) $4(3z^6 + 2)(5z^2 + 4)$ B) $4z^2(5z^3 - 4)(3z^3 - 2)$

C) $(3z^4 + 3)(5z^4 + 4)$ D) $4z^2(3z^3 + 2)(5z^3 + 4)$

Answer: D

651) $8(p + 3)^2 + 22(p + 3) + 15$

A) $(4p + 5)(2p + 3)$ B) $(4p + 17)(2p + 9)$ C) $(4p + 15)(2p + 11)$ D) $(4p + 8)(2p + 6)$

Answer: B

652) $a^2(a + b)^2 - ab(a + b)^2 - 6b^2(a + b)^2$

A) $(a + b)^2(a - 3)(a + 2)$ B) $(a + b)^2(a - 2b)(a + 3b)$

C) $(a + b)^2(a - 3b)(a + 2b)$ D) $(a - 3b)(a + 2b)(a + b)$

Answer: C

Find the domain of the expression.

653) $\frac{3}{p + 9}$

A) all real numbers B) $\{p \mid p \neq 3\}$ C) $\{p \mid p \neq 9\}$ D) $\{p \mid p \neq -9\}$

Answer: D

654) $\frac{3}{y + 5}$

A) $\{y \mid y \neq 5\}$ B) all real numbers C) $\{y \mid y > 3\}$ D) $\{y \mid y \neq -5\}$

Answer: D

655) $\frac{x - 4}{8 + x}$

A) all real numbers B) $\{x \mid x \neq 8\}$ C) $\{x \mid x \neq 4\}$ D) $\{x \mid x \neq -8\}$

Answer: D

656) $\frac{9x}{x - y}$

A) $\{x \mid x \neq y\}$ B) $\{x \mid x \neq 0 \text{ and } y \mid y \neq 0\}$

C) $\{x \mid x \neq 1 \text{ and } y \mid y \neq 1\}$ D) $\{x \mid x \neq -y\}$

Answer: A

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657) $\frac{4x - 5}{(2x - 1)(x + 2)}$

A) $\left\{\{x \mid x \neq \frac{2}{1}, -2\}\right\}$ B) $\left\{\{x \mid x \neq -\frac{1}{2}, 2\}\right\}$ C) $\left\{\{x \mid x \neq \frac{1}{2}, -2\}\right\}$ D) all real numbers

Answer: C

658) $\frac{x^2 - 49}{x^2 + 14x + 45}$

A) $\{x \mid x \neq -5$ and $x \neq -9\}$ B) $\{x \mid x \neq -7$ and $x \neq +7\}$
C) $\{x \mid x \neq 5$ and $x \neq 9\}$ D) $\{x \mid x \neq 0\}$

Answer: A

659) $\frac{y}{y^2 - 16}$

A) $\{y \mid y \neq 4$ and $y \neq -4\}$ B) $\{y \mid y \neq 256$ and $y \neq -256\}$
C) $\{y \mid y \neq 0\}$ D) $\{y \mid y \neq 16$ and $y \neq -16\}$

Answer: A

Write the expression in lowest terms.

660) $\frac{14k^2}{23k}$

A) $\frac{14}{23}k$ B) $\frac{7}{11}k$ C) $\frac{14}{23}$ D) $\frac{7}{11}$

Answer: A

661) $\frac{9m + 36}{6m + 24}$

A) $\frac{m + 4}{m + 24}$ B) 1 C) $\frac{3}{2}$ D) $m + 4$

Answer: C

662) $\frac{-4(m + 3)}{(m + 3)(m - 4)}$

A) $\frac{-4}{m - 4}$ B) $\frac{1}{m - 4}$ C) $\frac{m + 3}{m - 4}$ D) $\frac{-4}{m + 3}$

Answer: A

663) $\frac{z^2 - 10z + 24}{z^2 - 5z - 6}$

A) $\frac{z - 6}{z + 6}$ B) $\frac{z - 3}{z + 2}$ C) $\frac{z - 4}{z + 1}$ D) $\frac{z + 4}{z - 1}$

Answer: C

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664) $\frac{3x^2 + 7x + 2}{4x^2 + 13x + 10}$

A) $\frac{3x + 2}{4x - 2}$ B) $\frac{3x + 1}{4x + 5}$ C) $\frac{x - 1}{x - 5}$ D) $\frac{x + 2}{x + 6}$

Answer: B

665) $\frac{8x^3 + 12x}{16x^2}$

A) $\frac{2x^2 + 3}{4x}$ B) $2x^2 + 3$ C) $\frac{2x^2}{4x + 3}$ D) $\frac{2x + 3}{16}$

Answer: A

666) $\frac{x^3 + 8}{x + 2}$

A) $x^2 - 2x + 4$ B) $x^2 - 4x + 2$ C) $x^2 + 4$ D) $x^2 - 2$

Answer: A

667) $\frac{m^3 - 8}{m - 2}$

A) $x^2 + 2x + 4$ B) $x^2 - 2$ C) $x^2 + 4$ D) $x^2 - 4x + 2$

Answer: A

Find the product or quotient.

668) $\frac{4x^2}{3} \cdot \frac{24}{x^3}$

A) $\frac{96}{x}$ B) $\frac{32}{x}$ C) $32x$ D) $\frac{32}{x^2}$

Answer: B

669) $\frac{6p - 6}{p} \cdot \frac{8p^2}{8p - 8}$

A) $\frac{48p^3 - 48p^2}{8p^2 - 8p}$ B) $6p$ C) $\frac{1}{6}p$ D) $\frac{48p^2 + 96p + 48}{8p^3}$

Answer: B

670) $\frac{2x^2}{3} \div \frac{x^3}{12}$

A) $\frac{8}{x}$ B) $\frac{x}{8}$ C) $\frac{24x^2}{3x^3}$ D) $\frac{8x^2}{x^3}$

Answer: A

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671) $\frac{5p-5}{p} \div \frac{6p-6}{8p^2}$

A) $\frac{3}{20}p$ B) $\frac{20}{3}p$ C) $\frac{40p^3-40p^2}{6p^2-6p}$ D) $\frac{30p^2+60p+30}{8p^3}$

Answer: B

672) $\frac{k^2+7k+12}{k^2+12k+32} \cdot \frac{k^2+8k}{k^2+7k+12}$

A) $\frac{k}{k^2+12k+32}$ B) $\frac{k^2+8k}{k+4}$ C) $\frac{k}{k+4}$ D) $\frac{1}{k+4}$

Answer: C

673) $\frac{k^2+9k+18}{k^2+12k+27} \cdot \frac{k^2+9k}{k^2+2k-24}$

A) $\frac{1}{k-4}$ B) $\frac{k}{k-4}$ C) $\frac{k^2+9k}{k-4}$ D) $\frac{k}{k^2+12k+27}$

Answer: B

674) $\frac{z^2+8z+12}{z^2+10z+16} \div \frac{z^2+6z}{z^2+13z+40}$

A) $\frac{z+5}{z^2+8z}$ B) $\frac{z+5}{z}$ C) $\frac{z}{z^2+10z+16}$ D) $z+5$

Answer: B

675) $\frac{z^2+11z+18}{z^2+13z+36} \div \frac{z^2+2z}{z^2+2z-8}$

A) $z-2$ B) $\frac{z-2}{z^2+4z}$ C) $\frac{z-2}{z}$ D) $\frac{z}{z^2+13z+36}$

Answer: C

676) $\frac{(x-y)^2-49}{(x+y)^2-49} \div \frac{x-y-7}{x+y+7}$

A) $x-y+7$ B) $\frac{x+y+7}{x-y-7}$ C) -1 D) $\frac{x-y+7}{x+y-7}$

Answer: D

677) $\frac{8x^2+25x-28}{2x-10} \cdot \frac{x^2-5x}{64x^2-49} \div \frac{3x+12}{5x^3}$

A) $\frac{5x^3}{6(8x+7)}$ B) $\frac{5x^4}{6(8x+7)}$ C) $\frac{3(x+4)^2}{10x^2(8x+7)}$ D) $\frac{6}{5x^4(8x+7)}$

Answer: B

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Perform the indicated operations.

678) $\frac{2}{3x} + \frac{2}{3x}$

A) $\frac{16}{24x}$ B) $\frac{4}{3x}$ C) $\frac{3}{4x}$ D) 1

Answer: B

679) $\frac{2}{9x} - \frac{2}{3x}$

A) 1 B) $\frac{-2}{9x}$ C) $\frac{9}{-4x}$ D) $\frac{-4}{9x}$

Answer: D

680) $\frac{3}{10x} + \frac{9}{14x^2}$

A) $\frac{12}{140x^2}$ B) $\frac{12}{10x + 14x^2}$ C) $\frac{3(7x + 15)}{70x^2}$ D) $\frac{3(7x + 15)}{70x}$

Answer: C

681) $\frac{x}{x^2 - 16} - \frac{8}{x^2 + 5x + 4}$

A) $\frac{x^2 - 7x + 32}{(x - 4)(x + 4)}$ B) $\frac{x^2 + 7x + 32}{(x - 4)(x + 4)(x + 1)}$ C) $\frac{x^2 - 7}{(x - 4)(x + 4)(x +1)}$ D) $\frac{x^2 - 7x + 32}{(x - 4)(x + 4)(x + 1)}$

Answer: D

682) $\frac{2ab}{a^2 - b^2} - \frac{b}{a - b} + \frac{6}{2}$

A) $\frac{(a - b)(3a + 4b)}{a^2 - b^2}$ B) $\frac{2ab - b + 3}{a + b + 1}$ C) $\frac{3a + 4b}{a^2 - b^2}$ D) $\frac{3a + 4b}{a + b}$

Answer: D

683) $\frac{5}{3r^2 - 8rs - 3s^2} - \frac{3}{6r^2 - 19rs + 3s^2} + \frac{2}{18r^2 + 3rs - s^2}$

A) $\frac{23r - 14s}{(3r + s)(r - 3s)(6r - s)}$ B) $\frac{41r - 14s}{(3r + s)(r - 3s)(6r - s)}$

C) $\frac{41r - 8s}{(3r + s)(r - 3s)(6r - s)}$ D) $\frac{23r - 8s}{(3r + s)(r - 3s)(6r - s)}$

Answer: A

684) $\frac{2ab}{a^2 - b^2} - \frac{b}{a - b} + 4$

A) $\frac{4a + 5b}{a + b}$ B) $\frac{4a + 5b}{a^2 - b^2}$ C) $\frac{(a - b)(4a + 5b)}{a2 - b^2}$ D) $\frac{2ab - b + 4}{a + b + 1}$

Answer: A

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685) $\frac{1}{4x-8}-\frac{6}{5x+5}+\frac{1}{3x+6}$

A) $\frac{-37x^2+25x+13}{12x+19}$

B) $\frac{-37x^2+25x+278}{60(x-2)(x+1)(x+2)}$

C) $\frac{107x^2+25x+278}{12x+19}$

D) $\frac{107x^2+25x+278}{60(x-2)(x+1)(x+2)}$

Answer: B

686) $\frac{16x}{3(4x+1)}-\frac{1}{3x(4x+1)}+\frac{7}{x}$

A) $\frac{4(x+5)}{3x}$

B) $\frac{16x^2+84x+20}{12x^2+3x}$

C) $\frac{16x^2+84x+20}{3x}$

D) $\frac{4(x+5)}{12x^2+3x}$

Answer: A

687) $\frac{-25x}{7(5x+1)}+\frac{1}{7x(5x+1)}-\frac{3}{x}$

A) $\frac{-25x^2-105x-20}{7x}$

B) $\frac{-25x^2-105x-20}{35x^2+7x}$

C) $-\frac{5(x+4)}{7x}$

D) $-\frac{5(x+4)}{35x^2+7x}$

Answer: C

Write the expression with only positive exponents and evaluate if possible. Assume all variables represent nonzero real numbers.

688) $\frac{\frac{x}{6}}{\frac{5}{x+8}}$

A) $30x(x+8)$

B) $\frac{5x}{6(x+8)}$

C) $\frac{x+8}{30x}$

D) $\frac{x(x+8)}{30}$

Answer: D

689) $\frac{\frac{y}{7}}{\frac{4}{y+4}}$

A) $\frac{y+4}{28y}$

B) $\frac{4y}{7(y+4)}$

C) $\frac{y(y+4)}{28}$

D) $28y(y+4)$

Answer: C

690) $\frac{\frac{5}{y}}{\frac{6}{y+3}}$

A) $\frac{y+3}{30y}$

B) $\frac{6y}{5(y+3)}$

C) $\frac{5(y+3)}{6y}$

D) $30y(y+3)$

Answer: C

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691) $\dfrac{\frac{9}{y}}{\frac{6}{y+7}}$

A) $54y(y+7)$ B) $\dfrac{y+7}{54y}$ C) $\dfrac{2y}{3(y+7)}$ D) $\dfrac{3(y+7)}{2y}$

Answer: D

692) $\dfrac{\frac{1}{a}+1}{\frac{1}{a}-1}$

A) $\dfrac{1+a}{1-a}$ B) 1 C) $\dfrac{a}{1-a^2}$ D) $1-a^2$

Answer: A

693) $\dfrac{4+\frac{2}{x}}{\frac{x}{3}+\frac{1}{6}}$

A) 1 B) $\dfrac{12}{x}$ C) $\dfrac{x}{12}$ D) 12

Answer: B

694) $\dfrac{9+\frac{3}{s}}{\frac{s}{4}+\frac{1}{12}}$

A) 1 B) $\dfrac{s}{36}$ C) $\dfrac{36}{s}$ D) 36

Answer: C

695) $\dfrac{\frac{5}{p^2-49}+p}{\frac{1}{p+7}}$

A) $\dfrac{5+p^3+49p}{p}$ B) $\dfrac{5+p^2-49p}{p+49}$ C) $\dfrac{1}{p^2+7}$ D) $\dfrac{5+p^3-49p}{p-7}$

Answer: D

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696) $\dfrac{\dfrac{2}{x-h}+\dfrac{2}{x}}{2x-h}$

A) $\dfrac{2}{x(x-h)}$ B) $\dfrac{2}{x(x+h)}$ C) $\dfrac{1}{x(x-h)}$ D) h

Answer: A

697) $\dfrac{1}{h}\left(\dfrac{1}{(x+h)^2+7}-\dfrac{1}{x^2+7}\right)$

A) $\dfrac{2x}{\left((x+h)^2+7\right)}$ B) $\dfrac{2x+h}{((x+h)^2+7)(x^2+7)}$

C) $\dfrac{-2x-h}{((x+h)^2+7)(x^2+7)}$ D) $\dfrac{-2x+h}{(x+h)^2(x^2+7)}$

Answer: C

Solve the problem. Round to two decimal places unless otherwise indicated.

698) If the average cost per unit C(x) to produce x units of plywood is given by $C(x)=\dfrac{1200}{x+40}$, what is the unit cost for 10 units?

A) \$80.00 B) \$3.00 C) \$24.00 D) \$120.00

Answer: C

699) Suppose the cost per ton, y, to build an oil platform of x thousand tons is approximated by $y=\dfrac{262{,}500}{x+525}$. What is the cost per ton for x = 20?

A) \$13125.00 B) \$12600.00 C) \$25.00 D) \$481.65

Answer: D

700) In the following formula, y is the minimum number of hours of studying required to attain a test score of x: $y=\dfrac{0.54x}{100.5-x}$. How many hours of study are needed to score 86?

A) 5.58 hr B) 32.00 hr C) 100.87 hr D) 3.2 hr

Answer: D

701) If the average cost per unit C(x) to produce x units of plywood is given by $C(x)=\dfrac{1500}{x+50}$, what do 600 units cost?

A) \$1499.92 B) \$240.00 C) \$18000.00 D) \$1384.62

Answer: D

702) Suppose the cost per ton, y, to build an oil platform of x thousand tons is approximated by $y=\dfrac{312{,}500}{x+625}$. What is the cost per ton for x = 200?

A) \$100,000.00 B) \$75,757.58 C) \$378.79 D) \$937.50

Answer: C

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703) In the following formula, y is the minimum number of hours of studying required to attain a test score of x: $y = \frac{0.5x}{100.5 - x}$. How many hours of study are needed to score 95?

A) 8.64 hr B) 86.40 hr C) 17.36 hr D) 99.97 hr

Answer: A

704) Suppose a cost–benefit model is given by $y = \frac{9.5x}{100 - x}$, where y is the cost in thousands of dollars for removing x percent of a given pollutant. Find the cost of removing 90% to the nearest dollar.

A) $8550 B) $85,500 C) $9500 D) $9000

Answer: B

Write in radical form. Assume all variables represent positive real numbers.

705) $(6x)^{1/3}$

A) $\sqrt[3]{6x}$ B) $\sqrt[1/3]{6x}$ C) $\frac{1}{\sqrt[3]{6x}}$ D) $\frac{\sqrt{6x}}{3}$

Answer: A

706) $(-7x)^{1/5}$

A) $\sqrt[1/5]{-7x}$ B) $\sqrt[5]{-7x}$ C) $\frac{1}{\sqrt[5]{-7x}}$ D) $\sqrt{-\frac{7x}{5}}$

Answer: B

707) $10x^{1/5}$

A) $\sqrt[1/5]{10x}$ B) $10\sqrt[5]{x}$ C) $\frac{10}{\sqrt[5]{x}}$ D) $\sqrt[5]{10x}$

Answer: B

708) $(10x)^{1/3}$

A) $\sqrt[1/3]{10x}$ B) $\frac{\sqrt{10x}}{3}$ C) $\sqrt[3]{10x}$ D) $-\sqrt[3]{10x}$

Answer: C

709) $x^{1/5}$

A) x^{-5} B) $\frac{1}{\sqrt[5]{x}}$ C) $\sqrt{x^5}$ D) $\sqrt[5]{x}$

Answer: D

710) $(mn)^{1/7}$

A) $(\sqrt{mn})^7$ B) $\sqrt[7]{mn}$ C) $\frac{1}{\sqrt[7]{mn}}$ D) $(mn)^{-7}$

Answer: B

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711) $m^{4/3}$

A) $\left(\sqrt[3]{m}\right)^4$ B) $\sqrt[4]{m^3}$ C) $\frac{1}{\sqrt[4]{m}}$ D) $\left(\sqrt[4]{m}\right)^3$

Answer: A

712) $(3m^4 + 5k^2)^{4/5}$

A) $\left(\sqrt[4]{3m^4 + 5k^2}\right)^5$ B) $\frac{1}{\left(\sqrt[4]{3m^4 + 5k^2}\right)^5}$ C) $\frac{1}{\left(\sqrt[5]{3m^4 + 5k^2}\right)^4}$ D) $\left(\sqrt[5]{3m^4 + 5k^2}\right)^4$

Answer: D

713) $(4m + n)^{2/3}$

A) $\sqrt[3]{4m + n^2}$ B) $\sqrt[3]{(4m + n)^2}$ C) $\sqrt[2]{4m + n^3}$ D) $\sqrt[2]{(4m + n)^3}$

Answer: B

714) $(2m + 7n)^{3/5}$

A) $\sqrt[3]{(2m + 7n)^5}$ B) $\sqrt[5]{(2m + 7n)^3}$ C) $\sqrt[5]{2m + 7n^3}$ D) $\sqrt[3]{2m + 7n^5}$

Answer: B

Write in exponential form. Assume all variables are positive real numbers.

715) $\sqrt[4]{x^3}$

A) $x^{4/3}$ B) $4x^3$ C) $3x^4$ D) $x^{3/4}$

Answer: D

716) $\sqrt[7]{x^5}$

A) $x^{5/35}$ B) $x^{5/7}$ C) $x^{7/5}$ D) $x^{1/35}$

Answer: B

717) $-\sqrt{27m^7}$

A) $-27m^{7/2}$ B) $-27^{1/2}m^{7/2}$ C) $-729m^{2/7}$ D) $27m^{2/7}$

Answer: B

718) $-9\sqrt{2m^5}$

A) $-9 \cdot 2^{1/2}m^{5/2}$ B) $162m^{2/5}$ C) $-162m^{5/2}$ D) $(-9 \cdot 2)^{1/2}m^{5/2}$

Answer: A

Simplify the expression.

719) $\sqrt{(-49)^2}$

A) 7 B) −49 C) 49 D) −7

Answer: C

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720) $\sqrt{100x^2}$

A) $-10x$ B) $10|x|$ C) $10x^2$ D) $100x$

Answer: B

721) $\sqrt{(z-7)^2}$

A) $|z-7|$ B) $z-7$ C) $|z|-7$ D) $7-z$

Answer: A

722) $\sqrt{(5y+9)^2}$

A) $5y+9$ B) $-5y-9$ C) $|5y+9|$ D) $5|y|+9$

Answer: C

Simplify the expression. Assume all variables represent positive real numbers.

723) $\sqrt[3]{343}$

A) 7 B) ±7 C) 19 D) 49

Answer: A

724) $\sqrt[3]{-64}$

A) -4 B) 16 C) not a real number D) ±4

Answer: A

725) $-\sqrt[4]{1296}$

A) -36 B) not a real number C) -5 D) -6

Answer: D

726) $\sqrt[3]{-\frac{64}{27}}$

A) $\frac{4}{3}$ B) $-\frac{4}{3}$ C) $\frac{16}{9}$ D) $-\frac{64}{27}$

Answer: B

727) $\sqrt[4]{\frac{625}{256}}$

A) $\frac{625}{256}$ B) $\frac{125}{64}$ C) $\frac{25}{16}$ D) $\frac{5}{4}$

Answer: D

728) $\sqrt[8]{(-9)^8}$

A) -9 B) not a real number C) 81 D) 9

Answer: D

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729) $-\sqrt[3]{-27x^3}$

A) not a real number B) $3x^3$ C) $3x$ D) $-3x$

Answer: C

730) $\sqrt[4]{16a^4}$

A) $2a$ B) $2\sqrt{a}$ C) $16a$ D) $2a^2$

Answer: A

731) $\sqrt[3]{27k^6}$

A) $3k^2$ B) $27k^2$ C) $-3k^2$ D) $3k^9$

Answer: A

732) $\dfrac{\sqrt[3]{640}}{\sqrt[3]{10}}$

A) 4 B) $4\sqrt[3]{4}$ C) 64 D) 16

Answer: A

733) $-\sqrt{252}$

A) $-36\sqrt{7}$ B) not a real number C) $-6\sqrt{7}$ D) 15

Answer: C

734) $\sqrt{75}$

A) 5 B) 8 C) $25\sqrt{3}$ D) $5\sqrt{3}$

Answer: D

735) $\sqrt[3]{128}$

A) 11 B) $2\sqrt[3]{4}$ C) $4\sqrt[3]{2}$ D) 5

Answer: C

736) $\sqrt{54x^2y}$

A) $3x^2\sqrt{6y}$ B) $3xy^2\sqrt{6}$ C) $3x\sqrt{6y}$ D) $3xy\sqrt{6}$

Answer: C

737) $\sqrt{320x^2}$

A) $5x^2\sqrt{8}$ B) $8x\sqrt{5}$ C) $8\sqrt{5x}$ D) $320x$

Answer: B

738) $\sqrt{98k^7q^8}$

A) $7k^3q^4\sqrt{2}$ B) $7k^3q^4\sqrt{2k}$ C) $7k^7q^8\sqrt{2k}$ D) $7q^4\sqrt{2k^7}$

Answer: B

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739) $\sqrt[3]{216x^4y^5}$

A) $6xy\sqrt[3]{xy^2}$ B) $6xy^2\sqrt[3]{xy}$

C) $2x^2y^2\sqrt[3]{xy^2}$ D) $6xy\sqrt[3]{xy}$

Answer: A

740) $\sqrt[3]{-64a^8b^5}$

A) not a real number B) $4ab\sqrt[3]{a^2b^2}$ C) $-4a^2b\sqrt[3]{a^2b^2}$ D) $4ab\sqrt[3]{a^3b^3}$

Answer: C

741) $\sqrt[5]{x^{19}y^7z^{13}}$

A) $x^3yz^2\sqrt[5]{y^2z^3}$ B) $x^{15}y^5z^{10}\sqrt[5]{x^4y^2z^3}$ C) $xyz\sqrt[5]{x^4y^2z^3}$ D) $x^3yz^2\sqrt[5]{x^4y^2z^3}$

Answer: D

742) $\sqrt[3]{\sqrt{49}}$

A) $\sqrt[3]{7}$ B) $\sqrt{7}$ C) 7 D) $\sqrt[5]{49}$

Answer: A

743) $\sqrt{\frac{40}{27}}$

A) $\frac{3}{2}$ B) $\frac{2}{\sqrt{27}}$ C) $\frac{2\sqrt{30}}{9}$ D) $\frac{\sqrt{5}}{3}$

Answer: C

744) $\sqrt{\frac{26}{x^4}}$

A) $\frac{\sqrt{26}}{x}$ B) $\frac{26}{x^2}$ C) $\frac{\sqrt{26}}{x^2}$ D) $\frac{\sqrt{26}}{x^4}$

Answer: C

745) $\sqrt[5]{\frac{z^3}{32}}$

A) $\sqrt{\frac{5z^3}{32}}$ B) $\frac{\sqrt[5]{z^3}}{2}$ C) $\frac{z}{2}$ D) $\frac{\sqrt[5]{z}}{2}$

Answer: B

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746) $\sqrt{\frac{80x^2y}{49}}$

A) $\frac{4\sqrt{5x^2y}}{7}$ B) $\frac{4x\sqrt{5y}}{7}$ C) $x\sqrt{\frac{80y}{7}}$ D) $16x\sqrt{5y}$

Answer: B

747) $\sqrt{\frac{54a^2b}{c^2}}$

A) $\frac{a\sqrt{54b}}{c}$ B) $\frac{9a\sqrt{6b}}{c}$ C) $\frac{3a\sqrt{6b}}{c}$ D) $\frac{3\sqrt{6a^2b}}{c}$

Answer: C

748) $\sqrt[3]{\frac{y^{16}}{64}}$

A) $y^5 - 4\sqrt[3]{y}$ B) $\frac{y^5\sqrt[3]{y}}{4}$ C) $\frac{y^5 + \sqrt[3]{y}}{4}$ D) $4y^5\sqrt[3]{y}$

Answer: B

749) $-\sqrt{\frac{9}{40}}$

A) -40 B) $-3\sqrt{10}$ C) $-\frac{3\sqrt{10}}{10}$ D) $-\frac{3\sqrt{10}}{20}$

Answer: D

750) $\sqrt{\frac{81}{11}}$

A) 130 B) $\frac{81\sqrt{11}}{11}$ C) $9\sqrt{11}$ D) $\frac{9\sqrt{11}}{11}$

Answer: D

751) $\sqrt{\frac{50}{x}}$

A) $\frac{5\sqrt{2x}}{x}$ B) $\frac{\sqrt{5x}}{x}$ C) $5\sqrt{\frac{2}{x}}$ D) $5\sqrt{2x}$

Answer: A

752) $-\sqrt{\frac{50x^3}{y^5}}$

A) $-\frac{5x^3\sqrt{2}}{y^5}$ B) $-\frac{5x}{y^2}\sqrt{\frac{2x}{y}}$ C) $-\frac{5x\sqrt{2xy}}{y^3}$ D) $-\frac{x\sqrt{50xy}}{y^3}$

Answer: C

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753) $\sqrt[3]{\frac{4}{3}}$

A) $\frac{\sqrt[3]{108}}{3}$ B) $\frac{\sqrt[3]{12}}{3}$ C) $\frac{\sqrt[3]{36}}{3}$ D) $\frac{36}{3}$

Answer: C

754) $\sqrt[4]{\frac{7}{6}}$

A) $\frac{\sqrt[4]{216}}{6}$ B) $6\sqrt[4]{1512}$ C) $\frac{\sqrt[4]{1512}}{6}$ D) $\frac{\sqrt[4]{252}}{6}$

Answer: C

755) $\sqrt[3]{\frac{5}{9x^2}}$

A) $\frac{\sqrt[3]{45x}}{9x}$ B) $\frac{\sqrt[3]{15x}}{3x}$ C) $\frac{\sqrt[3]{405x^2}}{9x}$ D) $\frac{\sqrt[3]{405x}}{81}$

Answer: B

756) $-\sqrt[3]{\frac{5x}{y}}$

A) $-\frac{\sqrt[3]{5x^2y^2}}{y}$ B) $-\frac{\sqrt[3]{5x^2y}}{y}$ C) $-\frac{\sqrt[3]{5xy}}{y}$ D) $-\frac{\sqrt[3]{5xy^2}}{y}$

Answer: D

757) $\sqrt[4]{\frac{16}{y}}$

A) $\frac{2\sqrt[4]{y^3}}{y}$ B) $\frac{2\sqrt[4]{y^2}}{y}$ C) $\frac{2\sqrt[4]{y}}{y}$ D) $\frac{2\sqrt[4]{y^3}}{y^2}$

Answer: A

758) $\sqrt{225} + \sqrt{100}$

A) 5 B) $5\sqrt{13}$ C) 12.5 D) 25

Answer: D

759) $\sqrt{100} - \sqrt{144}$

A) $-\sqrt{2}$ B) -2 C) -1 D) $-2\sqrt{11}$

Answer: B

760) $6\sqrt{3} + 4\sqrt{3}$

A) $10\sqrt{6}$ B) $10\sqrt{3}$ C) 30 D) $24\sqrt{3}$

Answer: B

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761) $16\sqrt{13} - 13\sqrt{13}$

A) $29\sqrt{13}$ B) $-4\sqrt{13}$ C) $-28\sqrt{13}$ D) $3\sqrt{13}$

Answer: D

762) $3\sqrt{5} + 5\sqrt{20}$

A) $8\sqrt{5}$ B) $13\sqrt{5}$ C) $-13\sqrt{5}$ D) $7\sqrt{5}$

Answer: B

763) $\sqrt{2x} + 2\sqrt{32x} + 4\sqrt{8x}$

A) $6\sqrt{42x}$ B) $17\sqrt{2x}$ C) $7\sqrt{42x}$ D) $16\sqrt{2x}$

Answer: B

764) $6\sqrt{32x^2} - 3\sqrt{18x^2} - \sqrt{2x^2}$

A) $15x\sqrt{2}$ B) $14x\sqrt{2}$ C) $2x\sqrt{14}$ D) $3x\sqrt{14}$

Answer: B

765) $2\sqrt[3]{3} + 13\sqrt[3]{3}$

A) $11\sqrt[3]{3}$ B) $15\sqrt[3]{6}$ C) $15\sqrt[3]{9}$ D) $15\sqrt[3]{3}$

Answer: D

766) $8\sqrt[4]{x^7} - 5x\sqrt[4]{x^3}$

A) $3x\sqrt[4]{x^3}$ B) $3x\sqrt[4]{x^7}$ C) $8\sqrt[4]{x^7} - 5x\sqrt[4]{x^3}$ D) $13\sqrt[4]{x^3}$

Answer: A

767) $5\sqrt[3]{a} + \sqrt[3]{64a}$

A) $5\sqrt[3]{a} + \sqrt[3]{64a}$ B) $9\sqrt[3]{a}$ C) $6\sqrt[3]{64a}$ D) $20\sqrt[3]{a}$

Answer: B

768) $3\sqrt[3]{27x} + 3\sqrt[3]{125x}$

A) $24x$ B) $8\sqrt[3]{x}$ C) $24\sqrt[3]{x}$ D) $3\sqrt[3]{152x}$

Answer: C

769) $6\sqrt[5]{m^{11}p^7} - 4m^2p\sqrt[5]{mp^2}$

A) $2m^2p\sqrt[5]{mp^2}$ B) $10mp^2\sqrt[5]{mp^2}$

C) cannot be simplified D) 2

Answer: A

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770) $3\sqrt[5]{x^6y} - 2x\sqrt[5]{xy}$

A) $x\sqrt[5]{xy}$

B) cannot be simplified

C) $(3 - 2x)\sqrt[5]{xy}$

D) $2x\sqrt[5]{xy}$

Answer: A

771) $2\sqrt[3]{2} - 5\sqrt[3]{250}$

A) $23\sqrt[3]{2}$ B) $-3\sqrt[3]{2}$ C) $-23\sqrt[3]{2}$ D) $2\sqrt[3]{2} - 5\sqrt[3]{250}$

Answer: C

772) $\sqrt{15} \cdot \sqrt{12}$

A) $-6\sqrt{5}$ B) $-10\sqrt{3}$ C) $6\sqrt{5}$ D) $10\sqrt{3}$

Answer: C

773) $\sqrt[3]{175} \cdot \sqrt[3]{25}$

A) $5\sqrt[3]{25}$ B) $10\sqrt[3]{35}$ C) $5\sqrt[3]{35}$ D) $10\sqrt[3]{15}$

Answer: C

774) $\sqrt{14m^5} \cdot \sqrt{7m^5}$

A) $7m^5\sqrt{2}$ B) $14m^2\sqrt{7}$ C) $7m^6$ D) $7m^4\sqrt{2}$

Answer: A

775) $\sqrt[3]{xy^5} \cdot \sqrt[3]{x^{16}y^8}$

A) $x^5y^4\sqrt[3]{x^2y}$ B) $x^5y^4\sqrt[3]{xy^2}$ C) $x^5y^6\sqrt[3]{x^2y^2}$ D) $x^5y^5\sqrt[3]{xy}$

Answer: A

776) $(\sqrt{7} + 4)(\sqrt{7} - 4)$

A) 3 B) $7 - 2\sqrt{4}$ C) 23 D) -9

Answer: D

777) $(\sqrt{2} + \sqrt{11})(\sqrt{2} - \sqrt{11})$

A) -9 B) 13 C) $2 - 2\sqrt{22}$ D) $2 + 2\sqrt{22}$

Answer: A

778) $(4\sqrt{5} + 8\sqrt{2})(2\sqrt{5} + 2\sqrt{2})$

A) $8\sqrt{5} + 16\sqrt{2} + 24\sqrt{10}$

B) $8 + 24\sqrt{10}$

C) $8\sqrt{5} + 16\sqrt{2}$

D) $72 + 24\sqrt{10}$

Answer: D

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779) $(\sqrt{2} - 6)(\sqrt{6} - 4)$

A) $\sqrt{12} + 24$

B) $\sqrt{12} - 10\sqrt{6} + 24$

C) $-9\sqrt{12} + 24$

D) $\sqrt{12} - 4\sqrt{2} - 6\sqrt{6} + 24$

Answer: D

780) $\left(\sqrt[3]{5} - 2\right)\left(\sqrt[3]{5^2} + 2\sqrt[3]{5} + 4\right)$

A) 13

B) -3

C) $4\sqrt[3]{5^2} + 8\sqrt[3]{5} - 3$

D) $4\sqrt[3]{5^2} - 8\sqrt[3]{5} + 13$

Answer: B

781) $\dfrac{\sqrt[3]{x^2y} \cdot \sqrt[3]{x}}{\sqrt[3]{y^2}}$

A) $\dfrac{x\sqrt[3]{y^2}}{y}$

B) $x\sqrt[3]{y^2}$

C) $x\sqrt[3]{y}$

D) $\dfrac{x\sqrt[3]{y}}{y}$

Answer: A

782) $\dfrac{\sqrt[3]{27xy^2} \cdot \sqrt[3]{3y^2}}{\sqrt[3]{243xy^4}}$

A) $\sqrt[3]{3}$

B) $\dfrac{\sqrt[3]{9}}{9}$

C) $\dfrac{\sqrt[3]{9}}{3}$

D) $\dfrac{\sqrt[3]{3}}{3}$

Answer: C

783) $\dfrac{1}{\sqrt{5}} + \dfrac{4}{\sqrt{20}} - \dfrac{2}{\sqrt{45}}$

A) $-\dfrac{8}{15}\sqrt{5}$

B) $\dfrac{7}{15}\sqrt{5}$

C) $\dfrac{8}{15}\dfrac{1}{\sqrt{5}}$

D) $\dfrac{7}{15}\sqrt{35}$

Answer: B

784) $\dfrac{\sqrt{98}}{7} - \dfrac{6\sqrt{2}}{7} + \dfrac{\sqrt{2}}{\sqrt{49}}$

A) $\dfrac{2\sqrt{2}}{49}$

B) $\dfrac{2\sqrt{2}}{7}$

C) $\dfrac{4\sqrt{2}}{7}$

D) $-\dfrac{\sqrt{96}}{7}$

Answer: B

785) $\sqrt{\dfrac{2}{3}} - \sqrt{\dfrac{50}{75}}$

A) 0

B) -5

C) $-\dfrac{1}{5}$

D) -1

Answer: A

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786) $\frac{\sqrt{147}}{3} - \frac{4\sqrt{3}}{3} + \frac{\sqrt{3}}{\sqrt{9}}$

A) $\frac{6\sqrt{3}}{3}$ B) $\frac{4\sqrt{3}}{9}$ C) $\frac{4\sqrt{3}}{3}$ D) $-\frac{\sqrt{144}}{3}$

Answer: C

787) $\frac{5}{\sqrt[3]{3}} - \frac{32}{\sqrt[3]{24}} + \frac{1}{\sqrt[3]{81}}$

A) $-\frac{37}{9}\sqrt[3]{3}$ B) $-\frac{67}{18}\sqrt[3]{9}$ C) $\frac{31}{9}\sqrt[3]{3}$ D) $-\frac{32}{9}\sqrt[3]{9}$

Answer: D

788) $\frac{-5}{\sqrt[3]{2}} + \frac{37}{\sqrt[3]{54}} - \frac{1}{\sqrt[3]{16}}$

A) $\frac{41}{12}\sqrt[3]{4}$ B) $\frac{11}{3}\sqrt[3]{4}$ C) $\frac{41}{6}\sqrt[3]{2}$ D) $\frac{73}{12}\sqrt[3]{2}$

Answer: A

Rationalize the denominator. Assume that all variables represent nonnegative numbers and that the denominator is not zero.

789) $\frac{7}{8-\sqrt{5}}$

A) $\frac{56+7\sqrt{5}}{3}$ B) $\frac{56+7\sqrt{5}}{59}$ C) $\frac{7}{8} - \frac{7}{\sqrt{5}}$ D) $\frac{56-7\sqrt{5}}{59}$

Answer: B

790) $\frac{\sqrt{3}}{\sqrt{7}+2}$

A) $\frac{3\sqrt{21}+73}{14}$ B) $\frac{\sqrt{21}-2\sqrt{3}}{3}$ C) $\frac{\sqrt{21}-2\sqrt{3}}{9}$ D) $\frac{\sqrt{21}+2\sqrt{3}}{3}$

Answer: B

791) $\frac{7-\sqrt{2}}{7+\sqrt{2}}$

A) $\frac{51-14\sqrt{2}}{47}$ B) -1 C) $\frac{47-14\sqrt{2}}{51}$ D) $\frac{51+14\sqrt{2}}{47}$

Answer: A

792) $\frac{\sqrt{7}}{7\sqrt{6}-\sqrt{7}}$

A) $\frac{\sqrt{42}+1}{43}$ B) $\frac{\sqrt{42}+1}{41}$ C) $\frac{\sqrt{6}+1}{41}$ D) $\frac{\sqrt{42}-1}{41}$

Answer: B

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793) $\dfrac{4\sqrt{x}}{\sqrt{x}-2\sqrt{y}}$

A) $\dfrac{4\sqrt{x}(\sqrt{x}+2\sqrt{y})}{x-2y}$ B) $\dfrac{4\sqrt{x}(\sqrt{x}+2\sqrt{y})}{x-4y}$ C) $\dfrac{4\sqrt{x}(\sqrt{x}+2\sqrt{y})}{x+2y}$ D) $\dfrac{4\sqrt{x}(\sqrt{x}-2\sqrt{y})}{x+4y}$

Answer: B

794) $\dfrac{\sqrt{x}-\sqrt{y}}{\sqrt{3x}+\sqrt{2y}}$

A) $\dfrac{\sqrt{3x}-\sqrt{5xy}+\sqrt{2y}}{3x+2y}$ B) $\dfrac{\sqrt{3x}-\sqrt{5xy}+\sqrt{2y}}{3x-2y}$

C) $\dfrac{x\sqrt{3}-\sqrt{2xy}-\sqrt{3xy}+y\sqrt{2}}{3x-2y}$ D) $\dfrac{x\sqrt{3}-\sqrt{2xy}-\sqrt{3xy}+y\sqrt{2}}{3x+2y}$

Answer: C

795) $\dfrac{4}{\sqrt{x+h}-\sqrt{x}}$

A) $\dfrac{4\sqrt{h}}{h}$ B) $\dfrac{4\sqrt{x+h}+\sqrt{x}}{h}$ C) $\dfrac{4(\sqrt{x+h}+\sqrt{x})}{h}$ D) $\dfrac{4(\sqrt{x+h}-\sqrt{x})}{h}$

Answer: C

796) $\dfrac{a\sqrt{x}-2}{a\sqrt{x}+2}$

A) $\dfrac{a^2x+4a\sqrt{x}-4}{a^2x-4}$ B) $\dfrac{a^2x-4a\sqrt{x}+4}{a^2x+4}$ C) $\dfrac{a^2x-4a\sqrt{x}-4}{a^2x+4}$ D) $\dfrac{a^2x-4a\sqrt{x}+4}{a^2x-4}$

Answer: D

Solve the problem.

797) At an altitude of h feet above the surface of the earth, the approximate distance in miles that a person can see is given by $d = 1.2247\sqrt{h}$. How far can a person see if if he or she is 670 feet above the earth's surface? Round your answer to the nearest tenth of a mile.

A) 37.4 mi B) 34.1 mi C) 31.7 mi D) 32.8 mi

Answer: C

798) The formula $T = 0.07D^{1.5}$ can be used to approximate the duration of a storm, where is the time in hours and D is the diameter of the storm in miles. A storm that is 14.5 miles in diameter is heading toward a city. How long can the residents of the city expect the storm to last? Round you answer to the nearest hundredth of an hour.

A) 5.10 hr B) 3.87 hr C) 5.40 hr D) 3.30 hr

Answer: B

799) A formula for calculating the distance, d, one can see from an airplane to the horizon on a clear day is $d = 1.22x^{1/2}$, where x is the altitude of the plane in feet and d is given in miles. How far can one see in a plane flying at 27,000 feet? Round your answer to the nearest tenth mile, if necessary.

A) 1647 mi B) 181.5 mi C) 200.5 mi D) 16,470 mi

Answer: C

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800) The cost of manufacturing clocks is given by $c = 64(n + 4)^{1/2}$, where c is the cost in dollars and n is the number produced. What is the cost when no clocks are produced?

A) \$16 B) \$256 C) \$64 D) \$128

Answer: D

801) The length of the diagonal of a rectangle is given by $D = \sqrt{L^2 + W^2}$ where L and W are the length and width of the rectangle. What is the length of the diagonal, D, of a rectangle that is 92 inches long and 45 inches wide? Round your answer to the nearest tenth of an inch, if necessary.

A) 64.3 in. B) 102.4 in. C) 80.2 in. D) 11.7 in.

Answer: B

802) The length of the diagonal of a box is given by $D = \sqrt{L^2 + W^2 + H^2}$ where L, W, and H are the length, width, and height of the box. Find the length of the diagonal, D, of a box that is 1 ft long, 6 ft high, and 3 ft wide. Give the exact value.

A) 18 ft B) $\sqrt{46}$ ft C) 10 ft D) $3\sqrt{2}$ ft

Answer: B

803) The radius of a sphere is given by the formula $r = \sqrt{\frac{S}{4\pi}}$, where S is the surface area. If the surface area is 6856 square inches, what is the radius? Use 3.14 for π, and round your answer to the nearest tenth of an inch.

A) 23.4 in. B) 73.4 in. C) 41.4 in. D) 0 in.

Answer: A

804) The radius of a right circular cone is given by the formula $r = \sqrt{\frac{3V}{\pi h}}$, where V is the volume and h is the height. If the volume is 1553 cubic inches and the height is 15 inches, what is the radius? Use 3.14 for π, and round your answer to the nearest tenth of an inch.

A) 5.7 in. B) 10.4 in. C) 9.9 in. D) 0.1 in.

Answer: C

805) A simple exercise machine can be constructed by mounting a stiff spring securely to a wall and attaching a "T" handle to the free end of the spring. The arms can be exercised simply by pulling the "T" handle towards the torso. For a particular spring, the stretch distance is related to the work exerted by the equation $x = \sqrt{\frac{2W}{85000}}$, where W is the work exerted in joules and x is the stretch distance in cm. How far will you stretch the spring if you exert 623 joules of work? Round your answer to three decimal places.

A) 0.129 cm B) 0.015 cm C) 0.121 cm D) 0.086 cm

Answer: C

806) When determining appropriate doses of medication, it is sometimes important to estimate the body surface area (BSA) of a patient. This surface area (in m^2) can be approximated using the Mosteller formula $BSA = \left(\frac{h \cdot w}{3600}\right)^{1/2}$, where h is the patient's height in centimeters and w is the weight in kilograms. Determine the BSA for a patient with height 179 cm and weight 52 kg. Round your answer to two decimal places.

A) 6.69 m^2 B) 1.61 m^2 C) 2.59 m^2 D) 0.03 m^2

Answer: B

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1) D
2) C
3) A
4) C
5) D
6) D
7) D
8) B
9) C
10) C
11) B
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794) C
795) C
796) D
797) C
798) B
799) C
800) D

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801) B
802) B
803) A
804) C
805) C
806) B

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INSTRUCTOR'S TESTING MANUAL

COLLEGE ALGEBRA AND TRIGONOMETRY

SEVENTH EDITION

Margaret L. Lial
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CHAPTER TEST FORMS

College Algebra and Trigonometry 7th edition Lial Test Bank

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CHAPTER R, FORM A
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

1. Let $A=\left\{-9.6, \frac{54}{7}, 6\pi, 0, \sqrt{13}, 2.\overline{15}, \frac{16}{5}, \sqrt{49}\right\}$.

List the elements of A that belong to the given set.

a. Natural numbers

b. Rational numbers

c. Irrational numbers

1. **a.** _____ **b.** _____ **c.** _____

2. Evaluate the expression if $x=-2$, $y=-4$, and $z=1$:

$$\frac{|2y|-|x|^2}{(y-3z)^2}$$

2. _____

3. Identify the property illustrated. Let a, b, and c represent any real numbers.

a. $(a+b)c=ac+bc$

b. $a+[b+(-b)]=a+0$

c. $\left(\frac{1}{2}\cdot\frac{2}{3}\right)\cdot\frac{3}{4}=\frac{1}{2}\cdot\left(\frac{2}{3}\cdot\frac{3}{4}\right)$

d. $\frac{1}{2}(p+3)=(p+3)\cdot\frac{1}{2}$

3. **a.** _____ **b.** _____ **c.** _____ **d.** _____

Perform the indicated operations.

4. $[(3a+b)-2]^2$

4. _____

5. $(3x^2-2x-5)-(2x^3+x-7)+2x^2(x-3)$

5. _____

6. $(x^2-x+2)(2x-3)$

6. _____

7. $[(x-y)-7][(x-y)+7]$

7. _____

8. $(2x+5)^3$

8. _____

9. $\frac{3y^4-5y^3-14y^2+10y}{y^2-2}$

9. _____

10. $\frac{x^2-9}{x^2-x}\cdot\frac{x-1}{x^2-3x}$

10. _____

11. $\frac{3x}{x-4}-\frac{x}{x+4}-\frac{3x+1}{16-x^2}$

11. _____

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12. $\dfrac{3a+4b}{7a-5b}-\dfrac{4a-9b}{5b-7a}$ **12.** _____

13. $\dfrac{xy}{\dfrac{11}{x}+\dfrac{11}{y}}$ **13.** _____

14. $\dfrac{2\cdot 3-4^2}{-3(2+5)}$ **14.** _____

Factor completely.

15. $x^3y^2-4x^3+8y^2-32$ **15.** _____

16. $8a^3+64b^3$ **16.** _____

17. $6x^4-11x^3-35x^2$ **17.** _____

18. $28x^2+4x-9$ **18.** _____

19. Evaluate $\left(\dfrac{125}{27}\right)^{-2/3}$. **19.** _____

20. Simplify $\left(\dfrac{x^{2/3}y^{3/4}z^{-1/2}}{x^{-1/4}z^{-1/6}}\right)^{-6}$ so that there are no negative exponents. Assume that all variables represent positive real numbers. **20.** _____

Simplify. Assume that all variables represent positive real numbers.

21. $\sqrt[3]{8x^5y^3z^4}$ **21.** _____

22. $x\sqrt{112x}+4\sqrt{175x^3}$ **22.** _____

23. $\left(3+4\sqrt[3]{2}\right)\left(5-\sqrt[3]{4}\right)$ **23.** _____

24. Rationalize the denominator of $\dfrac{12}{5-2\sqrt{7}}$ and simplify. **24.** _____

25. Write the fraction $\dfrac{4}{5}$ as a decimal and a percent. **25.** _____

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26. The wind chill factor w is given by the equation
$w = 35.74 + 0.6215T - 35.75V^{0.16} + 0.4275TV^{0.16}$
where T represents the temperature in degrees Fahrenheit and V represents the wind velocity. Find the wind chill factor when the temperature is –40°F and the wind velocity is 15 mph. (Round to the nearest tenth.)

26. _____

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CHAPTER R, FORM B
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

1. Let $A=\left\{17, \frac{2}{5}, 0, -\pi, -\frac{12}{3}, \sqrt{3}, -4.\overline{2}, \sqrt{25}\right\}$

List the elements of A that belong to the given set.

a. Natural numbers — **1. a.** _____

b. Integers — **b.** _____

c. Irrational numbers — **c.** _____

2. Evaluate the expression if $x=1$, $y=-2$, and $z=3$: — **2.** _____

$$\frac{-4|2x+3y|}{2y^2-z}$$

3. Identify the property illustrated. Let a, b, and c represent any real numbers.

a. $\frac{1}{2}+\left(-\frac{1}{2}+b\right)=\left[\frac{1}{2}+\left(-\frac{1}{2}\right)\right]+b$ — **3. a.** _____

b. $(a+b)c=c(a+b)$ — **b.** _____

c. $2a+0=2a$ — **c.** _____

d. $\frac{3}{4}\cdot\frac{4}{3}=1$ — **d.** _____

Perform the indicated operations.

4. $[(3x-y)-1]^2$ — **4.** _____

5. $(x^2+2y)(x^2-2y)$ — **5.** _____

6. $x(x^2-1)-x^2(x+2)-x(2x-2)$ — **6.** _____

7. $[(x-3)+y][(x-3)-y]$ — **7.** _____

8. $(2x-3y)^3$ — **8.** _____

9. $\frac{6x^4-7x^3+5x^2-11x}{3x-2}$ — **9.** _____

10. $\frac{3x^2+7x+2}{x^2+2x}\cdot\frac{x^2-x}{3x^2+x}$ — **10.** _____

11. $\frac{2x}{x^2-25}-\frac{x+1}{x^2+5x}$ — **11.** _____

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CHAPTER R, FORM B

12. $\dfrac{9x}{3x-7}+\dfrac{21}{7-3x}$ **12.** _____

13. $\dfrac{\dfrac{x}{x+2}-\dfrac{2}{x-1}}{\dfrac{3}{x+2}+\dfrac{x}{x-1}}$ **13.** _____

14. $\dfrac{7-(8-2)}{3^3\cdot 2+1}$ **14.** _____

Factor completely.

15. $8x^2-53x-21$ **15.** _____

16. $3x^3+3x^2-27x-27$ **16.** _____

17. $x^3y^3-16x^3y-y^3+16y$ **17.** _____

18. $12ab^3-3abc^2$ **18.** _____

19. Evaluate $\left(-\dfrac{27}{64}\right)^{-2/3}$. **19.** _____

20. Simplify $\left(\dfrac{a^{2/3}b^{-3/4}c^{-1/5}}{a^{1/2}b^{1/4}}\right)^{10}$ so that there are no negative exponents. Assume that all variables represent positive real numbers. **20.** _____

Simplify. Assume that all variables represent positive real numbers.

21. $\sqrt{75x^{16}y^7z^{10}}$ **21.** _____

22. $2\sqrt{24x}-5\sqrt{54x}+8\sqrt{6x}$ **22.** _____

23. $\left(3+4\sqrt[3]{25}\right)\left(2-3\sqrt[3]{5}\right)$ **23.** _____

24. Rationalize the denominator of $\sqrt[3]{\dfrac{1}{2}}+\sqrt[3]{\dfrac{1}{16}}$ and simplify. **24.** _____

25. Write the fraction $1\dfrac{3}{5}$ as a decimal and a percent. **25.** _____

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26. Police sometimes use the following procedure to estimate the speed at which a car was traveling at the time of an accident: A police officer drives a car that is the same type as the one involved in the accident under conditions similar to those during which the accident took place and then skids to a stop. If the car is driven at 30 mph, then the speed at the time of the accident is given by

$$s = 30\sqrt{\frac{a}{p}},$$

where a is the length of the skid marks left at the time of the accident and p is the length of the skid marks in the police test. Find s, the speed, when a is 325 ft and p is 102 ft. (Round to the nearest tenth.)

26. _____

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CHAPTER R, FORM C
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

1. Let $A=\left\{\frac{70}{10}, -\frac{1}{8}, -2\pi, 0, \sqrt{64}, \sqrt{19}, 1.\overline{23}, -4, 2.76\right\}$.
List the elements of A that belong to the given set.

a. Rational numbers — **1. a.** _____

b. Real numbers — **b.** _____

c. Whole numbers — **c.** _____

2. Evaluate the expression if $x=-2$, $y=-1$, and $z=3$: — **2.** _____

$$\frac{-x^2+3|y|}{x(y+2z)}$$

3. Identify the property illustrated. Let a, b, and c represent any real numbers.

a. $\frac{1}{3}(a+b)=\frac{1}{3}(b+a)$ — **3. a.** _____

b. $\frac{1}{2}+\left(-\frac{1}{2}\right)=0$ — **b.** _____

c. $9(a+b)=9a+9b$ — **c.** _____

d. $2(9a)=(2\cdot 9)a$ — **d.** _____

Perform the indicated operations.

4. $\left[(x-4y)+2\right]^2$ — **4.** _____

5. $-3(x^3-x)+2(x^2+x)+3(x^3-2x)$ — **5.** _____

6. $(3x+2y)(2x^2-3xy+4y^2)$ — **6.** _____

7. $\left[(a+5)-2b\right]\left[(a+5)+2b\right]$ — **7.** _____

8. $(4b-3c)^3$ — **8.** _____

9. $\frac{x^5-2x^3-3x^2+9}{x^3-2}$ — **9.** _____

10. $\frac{6x^2-5x-6}{x^2-4}\div\frac{2x^2-3}{x+2}$ — **10.** _____

11. $\frac{x^2+x-20}{x^2-16}\cdot\frac{x^2-25}{x-5}$ — **11.** _____

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CHAPTER R, FORM C

12. $\dfrac{3a+4b}{7a-5b}+\dfrac{10a-b}{5b-7a}$ **12.** _____

13. $\dfrac{\dfrac{2}{x}-1}{\dfrac{4}{x^2}-1}$ **13.** _____

14. $\dfrac{2(3+4-1)^2}{3-2^3}$ **14.** _____

Factor completely.

15. $10x^2-19xy+6y^2$ **15.** _____

16. x^4-16 **16.** _____

17. $a^3+2a^2b-4ab^2-8b^3$ **17.** _____

18. $2x^4-18x^2y^2$ **18.** _____

19. Evaluate $\left(\dfrac{27}{64}\right)^{-4/3}$. **19.** _____

20. Simplify $\left(\dfrac{a^{-3/8}b^{-1/6}}{a^{5/4}b^{-2/3}c^{-3/4}}\right)^{-12}$ so that there are no negative exponents. Assume that all variables represent positive real numbers. **20.** _____

Simplify. Assume that all variables represent positive real numbers.

21. $\sqrt{80a^5b^{13}}$ **21.** _____

22. $\sqrt[3]{16xy^4}+y\sqrt[3]{2xy}-\sqrt[3]{54xy^4}$ **22.** _____

23. $\left(3\sqrt{x}+2\sqrt{y}\right)\left(3\sqrt{x}-2\sqrt{y}\right)$ **23.** _____

24. Rationalize the denominator of $\dfrac{12}{\sqrt{3}+\sqrt{7}}$ and simplify. **24.** _____

25. Write the fraction $\dfrac{12}{5}$ as a decimal and a percent. **25.** _____

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26. Police sometimes use the following procedure to estimate the speed at which a car was traveling at the time of an accident: A police officer drives a car that is the same type as the one involved in the accident under conditions similar to those during which the accident took place and then skids to a stop. If the car is driven at 30 mph, then the speed at the time of the accident is given by

$$s = 30\sqrt{\frac{a}{p}},$$

where a is the length of the skid marks left at the time of the accident and p is the length of the skid marks in the police test. Find s, the speed, when a is 375 ft and p is 185 ft. (Round to the nearest tenth).

26. _____

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CHAPTER R, FORM D
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

1. Let $A=\left\{\sqrt{5}, -17.8, -3.\overline{6}, 0, -\frac{10}{2}, \sqrt{49}, 3\pi, \frac{5}{3}, 8\right\}$.
List the elements of A that belong to the given set.

a. Natural numbers — **1. a.** _____

b. Rational numbers — **b.** _____

c. Integers — **c.** _____

2. Evaluate the expression if $x=-3$, $y=-4$, and $z=1$: — **2.** _____

$$\frac{|2x+5z|}{(2|x|-y)^2}$$

3. Identify the property illustrated. Let a, b and c represent any real numbers.

a. $a(b+c)=(b+c)a$ — **3. a.** _____

b. $\left(\frac{2}{7}\cdot\frac{1}{5}\right)b=\frac{2}{7}\cdot\left(\frac{1}{5}b\right)$ — **b.** _____

c. $\frac{1}{4}\cdot 1=\frac{1}{4}$ — **c.** _____

d. $4[a+(-a)]=4a+4(-a)$ — **d.** _____

Perform the indicated operations.

4. $[(2x-3y)-2]^2$ — **4.** _____

5. $(2x^2-3x+1)(x^2+x-2)$ — **5.** _____

6. $(3x^3-4x^2+x-7)+(x^4-2x^3+3x^2+5)$ — **6.** _____

7. $[(r+2s)-4][(r+2s)+4]$ — **7.** _____

8. $(2a+b)^3$ — **8.** _____

9. $\frac{2y^4-2y^3-11y^2+6y}{y^2-3}$ — **9.** _____

10. $\frac{2x^2+x-3}{3x^2-7x+4}\div\frac{10x+15}{3x^2-x-4}$ — **10.** _____

11. $\frac{x-4}{x^2-10x+16}-\frac{x+1}{x^2+5x-14}$ — **11.** _____

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CHAPTER R, FORM D

12. $\dfrac{x+3}{x^2-4}+\dfrac{2x+5}{4-x^2}$ **12.** _____

13. $\dfrac{\dfrac{1}{x+2}-3}{\dfrac{4}{x}-x}$ **13.** _____

14. $\dfrac{4+3\cdot 7-1}{2-4\cdot 5}$ **14.** _____

Factor completely.

15. $18x^2-27x+4$ **15.** _____

16. $6x^4+11x^2-10$ **16.** _____

17. $r^4-8rs^3-2r^3s+16s^4$ **17.** _____

18. $8x^3+64y^3$ **18.** _____

19. Evaluate $\left(\dfrac{16}{49}\right)^{-3/2}$. **19.** _____

20. Simplify $\left(\dfrac{x^{3/2}y^{-4/3}z^{5/6}}{x^{2/3}y^{5/4}z^{-1/4}}\right)^6$ so that there are no negative exponents. Assume that all variables represent positive real numbers. **20.** _____

Simplify. Assume that all variables represent positive real numbers.

21. $\sqrt{84a^{14}b^{18}c^5}$ **21.** _____

22. $\sqrt[4]{768x^5}+\sqrt[4]{48x^5}$ **22.** _____

23. $\left(\sqrt{10}+2\sqrt{6}\right)\left(\sqrt{10}-\sqrt{6}\right)$ **23.** _____

24. Rationalize the denominator of $\sqrt{\dfrac{1}{3}}-\sqrt{\dfrac{1}{27}}$ and simplify. **24.** _____

25. Write the fraction $-\dfrac{3}{8}$ as a decimal and a percent. **25.** _____

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26. The length of one leg of a right triangle is $a = \sqrt{c^2 - b^2}$ where c is the length of the hypotenuse and b is the length of the other leg. Find the length of the unknown leg if the length of the hypotenuse is 45 m and the length of the other leg is 28 m. (Round to the nearest tenth.)

26. _____

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CHAPTER R, FORM E
COLLEGE ALGEBRA AND TRIGONOMETERY

NAME_____
DATE_____

1. Let $A = \left\{\frac{5}{8}, -3.\overline{2}, \frac{\pi}{8}, -4, \sqrt{64}, \sqrt{3}, \frac{12}{2}, 0\right\}$.
List the elements of A that belong to the given set.

A. Rational numbers **1. A.** _____

a. $\left\{\frac{5}{8}, -3.\overline{2}, -4, \sqrt{64}, \frac{12}{2}\right\}$ **b.** $\left\{-4, \sqrt{64}, \frac{12}{2}, 0\right\}$

c. $\left\{\frac{5}{8}, -4, \sqrt{64}, \frac{12}{2}, 0\right\}$ **d.** $\left\{\frac{5}{8}, -3.\overline{2}, -4, \sqrt{64}, \frac{12}{2}, 0\right\}$

B. Real numbers **B.** _____

a. $\left\{\frac{\pi}{8}, \sqrt{3}\right\}$ **b.** $\left\{-4, \sqrt{64}, \frac{12}{2}, 0\right\}$

c. $\left\{\frac{5}{8}, -3.\overline{2}, \frac{\pi}{8}, -4, \sqrt{64}, \sqrt{3}, \frac{12}{2}, 0\right\}$ **d.** $\left\{-3.\overline{2}, \frac{\pi}{8}, \sqrt{3}\right\}$

C. Natural numbers **C.** _____

a. $\left\{\frac{5}{8}, -3.\overline{2}, -4, \sqrt{64}, \frac{12}{2}, 0\right\}$ **b.** $\left\{-4, \sqrt{64}, \frac{12}{2}, 0\right\}$

c. $\left\{\sqrt{64}, \frac{12}{2}, 0\right\}$ **d.** $\left\{\sqrt{64}, \frac{12}{2}\right\}$

2. Evaluate the expression if $x = -5$ and $y = -2$: **2.** _____

$$\frac{|x-4|-|2y|}{|-3y-4x|}$$

a. $\frac{5}{23}$ **b.** $\frac{5}{26}$ **c.** $\frac{5}{14}$ **d.** $\frac{1}{2}$

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3. Identify the property illustrated. Let a and b represent any real numbers.

A. $\left(\frac{1}{3}+0\right)\cdot\frac{2}{7}=\frac{1}{3}\cdot\frac{2}{7}$ **3. A.** _____

a. Associative **b.** Inverse
c. Identity **d.** Commutative

B. $8(a+b)=8(b+a)$ **B.** _____

a. Associative **b.** Distributive
c. Identity **d.** Commutative

C. $4(2+3)=4\cdot 2+4\cdot 3$ **C.** _____

a. Associative **b.** Distributive
c. Commutative **d.** Inverse

D. $a+(-a)=0$ **D.** _____

a. Inverse **b.** Identity
c. Associative **d.** Distributive

Perform the indicated operations.

4. $[(2a-b)+7]^2$ **4.** _____

a. $4a^2+b^2+49$ **b.** $4a^2-4ab+b^2+28a-14b+49$
c. $4a^2-b^2+49$ **d.** $4a^2-4ab+b^2+14a-7b+49$

5. $(8x^2+3x-4)+(7x^2+9x+8)$ **5.** _____

a. $15x^2+12x-4$ **b.** $15x^2-12x+4$
c. $15x^2+12x+4$ **d.** $3x^2+17x+11$

6. $(3s-1)(s^2-4s+2)$ **6.** _____

a. $3s^3-13s^2-10s-2$ **b.** $3s^3-13s^2+2s-2$
c. $3s^3-13s^2+10s-2$ **d.** $3s^3-13s^2-2s-2$

7. $[(2s+t)-3][(2s+t)+3]$ **7.** _____

a. $4s^2+t^2-9$ **b.** $4s^2+4st+t^2-9$
c. $4s^2+4st+t^2+9$ **d.** $4s^2+t^2+9$

8. $(4x-3)^3$ **8.** _____

a. $64x^3-96x^2+72x-27$ **b.** $64x^3-27$
c. $64x^3-144x^2+108x-27$ **d.** $64x^3-192x^2+144x-27$

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9. $\dfrac{-2x^3+7x^2-7x+12}{2x-1}$ **9.** _____

a. $-x^2+3x-2+\dfrac{14}{2x-1}$ **b.** $-x^2+4x-11+\dfrac{23}{2x-1}$

c. $-x^2+4x-11+\dfrac{1}{2x-1}$ **d.** $-x^2+3x-2+\dfrac{10}{2x-1}$

10. $\dfrac{2-3\cdot 4^2+15}{-\left(4+(-2)^2\right)}$ **10.** _____

a. $\dfrac{31}{16}$ **b.** $-\dfrac{31}{16}$

c. $\dfrac{31}{8}$ **d.** $-\dfrac{31}{8}$

Factor completely.

11. $x^2+6x-72$ **11.** _____

a. $(x-12)(x+6)$ **b.** $(x+12)(x-6)$

c. $(x-12)(x+1)$ **d.** $(x+12)(x+6)$

12. $8x^3-125$ **12.** _____

a. $(2x+5)\left(4x^2-10x+25\right)$ **b.** $(2x-5)\left(4x^2+20x+25\right)$

c. $(2x-5)\left(4x^2+10x+25\right)$ **d.** $(2x+5)\left(4x^2-20x+25\right)$

13. $75y^4-147y^2$ **13.** _____

a. $3\left(5y^2+7\right)\left(5y^2-7\right)$ **b.** $3y^2(5y+7)(5y-7)$

c. $3y^2(5y-7)^2$ **d.** $3y(5y-7)^2$

14. $4x^2-y^2-6y-9$ **14.** _____

a. $(4x-y+3)(4x+y-3)$ **b.** $(2x-y+3)(2x+y-3)$

c. $(2x-y-3)(2x+y+3)$ **d.** $(4x-y-3)(4x+y+3)$

Perform the indicated operations.

15. $\dfrac{x^2+3x+2}{x^2+x-2}\cdot\dfrac{x^2-4}{x^2-x-2}$ **15.** _____

a. $\dfrac{x+1}{x-2}$ **b.** $\dfrac{x-2}{x-1}$

c. $\dfrac{x-2}{x+1}$ **d.** $\dfrac{x+2}{x-1}$

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CHAPTER R, FORM E

16. $\dfrac{2y-2}{y^2-4y}-\dfrac{y+8}{y^2-16}$ **16.** _____

a. $\dfrac{3y^2+14y-8}{y(y-4)(y+4)}$ **b.** $\dfrac{y^2+14y-8}{y(y-4)(y+4)}$

c. $\dfrac{y+2}{y(y+4)}$ **d.** $\dfrac{y-10}{2(y-4)(y+2)}$

17. $\dfrac{\dfrac{4}{x^2}-\dfrac{1}{4}}{\dfrac{2}{x}-\dfrac{1}{2}}$ **17.** _____

a. $\dfrac{3}{2x}$ **b.** $\dfrac{3}{x-2}$ **c.** $\dfrac{4+x}{2x}$ **d.** $\dfrac{4x}{x-2}$

18. $\dfrac{3x+12}{10}\div\dfrac{5x+20}{20}$ **18.** _____

a. $\dfrac{3x+12}{50x}$ **b.** $\dfrac{8x+32}{30}$ **c.** $\dfrac{3}{40}$ **d.** $\dfrac{6}{5}$

19. Evaluate $\left(\dfrac{49}{25}\right)^{-3/2}$. **19.** _____

a. $-\dfrac{125}{343}$ **b.** $\dfrac{343}{125}$ **c.** $\dfrac{125}{343}$ **d.** $-\dfrac{343}{125}$

20. Simplify $\left(\dfrac{x^{2/5}y^{1/4}z^{-3/4}}{x^{-3/4}y^{1/5}}\right)^{10}$ so that there are no negative exponents. **20.** _____

Assume that all variables represent positive real numbers.

a. $\dfrac{x^{23/2}y^{1/2}}{z^{15/2}}$ **b.** $x^{23/20}y^{1/20}z^{37/4}$

c. $\dfrac{y^{9/2}}{x^{7/2}z^{15/2}}$ **d.** $x^{393/20}y^{409/20}z^{37/4}$

Simplify. Assume that all variables represent positive real numbers.

21. $\sqrt[3]{125x^5y^6}$ **21.** _____

a. $5x^2y^2\sqrt[3]{xy}$ **b.** $5xy\sqrt[3]{xy}$

c. $5xy^2\sqrt[3]{x^2}$ **d.** $5xy\sqrt[3]{x}$

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22. $\sqrt{3x}-2\sqrt{12x}+4\sqrt{18x}$ **22.** _____

a. $9x\sqrt{6}$ **b.** $\sqrt{3x}+8\sqrt{2x}$
c. $-3\sqrt{3x}+12\sqrt{2x}$ **d.** $9\sqrt{3x}$

23. $\left(\sqrt{10}+2\sqrt{5}\right)^2$ **23.** _____

a. 30 **b.** $30+20\sqrt{2}$
c. $30+10\sqrt{2}$ **d.** 20

24. Rationalize the denominator of $\dfrac{15}{2\sqrt{7}-\sqrt{10}}$. **24.** _____

a. $\dfrac{5\left(2\sqrt{7}-\sqrt{10}\right)}{6}$ **b.** $\dfrac{15\left(2\sqrt{7}+\sqrt{10}\right)}{4}$
c. $\dfrac{5\left(2\sqrt{7}+\sqrt{10}\right)}{6}$ **d.** $\dfrac{15\left(2\sqrt{7}-\sqrt{10}\right)}{4}$

25. Write the fraction $\dfrac{5}{4}$ as a decimal and a percent. **25.** _____

a. 1.25, 125% **b.** 1.25, 12.5%
c. 1.45, 145% **d.** 1.45, 14.5%

26. One of the two solutions of a quadratic equation, x, can be found by the formula **26.** _____

$$x=\frac{-b+\sqrt{b^2-4ac}}{2a},$$

where a is the coefficient of the squared term, b is the coefficient of the linear term, and c is the constant term. Find one of the solutions if $a=5$, $b=-7$, and $c=-6$.

a. 2 **b.** $-\dfrac{4}{5}$ **c.** $\dfrac{7-\sqrt{71}}{10}$ **d.** $\dfrac{7+\sqrt{71}}{10}$

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CHAPTER R, FORM F
COLLEGE ALGEBRA AND TRIGONOMETERY

NAME_____
DATE_____

1. Let $B = \left\{\sqrt{10}, -1.\overline{55}, 12, \frac{15}{5}, -\pi, \sqrt{64}, 0, \frac{5}{14}\right\}$.

List the elements of B that belong to the given set.

A. Irrational numbers **1. A.** _____

a. $\left\{\sqrt{10}, -1.\overline{55}, 12, \frac{15}{5}, -\pi, \sqrt{64}, 0, \frac{5}{14}\right\}$ **b.** $\left\{\sqrt{10}, -1.\overline{55}, -\pi, \sqrt{64}, 0\right\}$

c. $\left\{\sqrt{10}, -\pi, 0\right\}$ **d.** $\left\{\sqrt{10}, -\pi\right\}$

B. Natural numbers **B.** _____

a. $\left\{12, \frac{15}{5}, \sqrt{64}, 0\right\}$ **b.** $\left\{12, \frac{15}{5}, \sqrt{64}\right\}$

c. $\left\{12, \frac{15}{5}, 0, -1.\overline{55}, \sqrt{64}\right\}$ **d.** $\left\{12, \frac{15}{5}\right\}$

C. Integers **C.** _____

a. $\left\{12, \frac{15}{5}, \sqrt{64}\right\}$ **b.** $\left\{12, \frac{15}{5}, \sqrt{64}, 0\right\}$

c. $\left\{12, \frac{15}{5}\right\}$ **d.** $\left\{12, \frac{15}{5}, 0, -1.\overline{55}, \sqrt{64}, \frac{5}{14}\right\}$

2. Evaluate the expression if $x = -2$, $y = 1$, and $z = -3$: **2.** _____

$$\frac{|5x - 2y|}{|x| + 2z^2}$$

a. $-\frac{1}{3}$ **b.** $\frac{3}{5}$ **c.** $-\frac{1}{4}$ **d.** $\frac{1}{3}$

3. Identify the property illustrated. Let a and b represent any real numbers.

A. $1 \cdot \sqrt{3} = \sqrt{3}$ **3. A.** _____

a. Associative **b.** Inverse
c. Identity **d.** Distributive

B. $(x + y) + 0 = x + (y + 0)$ **B.** _____

a. Associative **b.** Commutative
c. Identity **d.** Distributive

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C. $\frac{\pi}{3}\cdot\frac{3}{\pi}=1$ **C.** _____

a. Commutative
b. Inverse
c. Identity
d. Distributive

D. $9(a+b)=9(b+a)$ **D.** _____

a. Associative
b. Distributive
c. Commutative
d. Inverse

Perform the indicated operations.

4. $[(3a+2b)-2]^2$ **4.** _____

a. $9a^2+4b^2-4$
b. $9a^2+12ab+4b^2-12a-8b+4$
c. $9a^2+12ab+4b^2-6a-4b+4$
d. $9a^2+4b^2+4$

5. $(-2x-5y)(-2x+8y)$ **5.** _____

a. $4x^2-6xy-6y^2$
b. $4x^2+10xy-40y^2$
c. $4x^2-6xy-40y^2$
d. $4x^2-16xy-40y^2$

6. $(-2x^2+5x+8)-(x^3-7x-2)+4x(x^2-3)$ **6.** _____

a. $3x^3-2x^2-14x+6$
b. $-5x^3-2x^2-14x+6$
c. $5x^3-2x^2-14x+6$
d. $3x^3-2x^2+10$

7. $[(r-2)+3s][(r-2)-3s]$ **7.** _____

a. r^2+4-9s^2
b. r^2-4-9s^2
c. $r^2-4r-4-9s^2$
d. $r^2-4r+4-9s^2$

8. $(x+3)^4$ **8.** _____

a. $x^4+6x^3+18x^2+54x+81$
b. $x^4+6x^3+36x^2+54x+81$
c. x^4+81
d. $x^4+12x^3+54x^2+108x+81$

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9. $\dfrac{3x^3+5x-8}{x-2}$ **9.** _____

a. $3x^2+11x+22+\dfrac{36}{x-2}$ **b.** $3x^2+11x+\dfrac{14}{x-2}$

c. $3x^2-6x+17-\dfrac{42}{x-2}$ **d.** $3x^2+6x+17+\dfrac{26}{x-2}$

10. $\dfrac{3-4\cdot 2^2+10}{-\left(2+(-3)^2\right)}$ **10.** _____

a. $\dfrac{3}{10}$ **b.** $-\dfrac{3}{10}$

c. $\dfrac{3}{11}$ **d.** $-\dfrac{3}{11}$

Factor completely.

11. $18x^2-78x-60$ **11.** _____

a. $(18x+12)(x-5)$ **b.** $6(3x+2)(x-5)$

c. $6(3x-2)(x+5)$ **d.** $6(3x+2)(x+5)$

12. $125x^3+216y^3$ **12.** _____

a. $(5x-6y)\left(25x^2+30xy+36y^2\right)$ **b.** $(5x+6y)\left(25x^2-30xy+36y^2\right)$

c. $(5x+6y)\left(25x^2-60xy+36y^2\right)$ **d.** $(5x-6y)\left(25x^2+60xy+36y^2\right)$

13. $100a^2-16$ **13.** _____

a. $(10a-4)(10a+4)$ **b.** $2(5a-2)^2$

c. $4(5a-2)(5a+2)$ **d.** $4(5a-2)^2$

14. $r^3s^2+4r^3-8s^2-32$ **14.** _____

a. $(r-2)(r+2)^2(s-2)(s+2)$ **b.** $(r-2)\left(r^2+2r+4\right)\left(s^2+4\right)$

c. $(r-2)\left(r^2+2r+4\right)(s-2)(s+2)$ **d.** $(r-2)\left(r^2-2r+4\right)(s-2)(s+2)$

Perform the indicated operations.

15. $\dfrac{x^2+5x-14}{x^2-4}\div\dfrac{x^2+12x+35}{x^2+12x+20}$ **15.** _____

a. $\dfrac{x+10}{x+5}$ **b.** $\dfrac{x+5}{x+10}$

c. $\dfrac{x+1}{x+2}$ **d.** $\dfrac{x+2}{x+1}$

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16. $\dfrac{3a+7}{a^2+5a+6}-\dfrac{a-5}{a^2+2a-3}$ **16.** _____

a. $\dfrac{2a^2-3a-17}{(a+2)(a+3)(a-1)}$ **b.** $\dfrac{2a+1}{(a-1)(a+2)}$

c. $\dfrac{2(a+6)}{3(a+3)}$ **d.** $\dfrac{4a^2+a-17}{(a+2)(a+3)(a-1)}$

17. $\dfrac{\dfrac{1}{x+3}-\dfrac{2}{3}}{\dfrac{2}{x+3}-\dfrac{1}{3}}$ **17.** _____

a. $\dfrac{3+2x}{x-3}$ **b.** -1 **c.** $\dfrac{-3-2x}{1+x}$ **d.** $\dfrac{6}{x+3}$

18. $\dfrac{8s+t}{5s-t}-\dfrac{2t+7s}{t-5s}$ **18.** _____

a. $\dfrac{s-t}{5s-t}$ **b.** $\dfrac{t-s}{5s-t}$ **c.** $\dfrac{15s+3t}{5s-t}$ **d.** 3

19. Evaluate $\left(\dfrac{64}{27}\right)^{-2/3}$ **19.** _____

a. $\dfrac{9}{16}$ **b.** $-\dfrac{16}{9}$ **c.** $\dfrac{16}{9}$ **d.** $-\dfrac{9}{16}$

20. Simplify $\left(\dfrac{x^{5/3}y^{-3/2}}{x^{1/6}y^{5/3}z^{-5/6}}\right)^{18}$ so that there are no negative exponents. **20.** _____

Assume that all variables represent positive real numbers.

a. $\dfrac{x^{27}y^{57}}{z^{15}}$ **b.** $\dfrac{x^{27}z^{15}}{y^{57}}$ **c.** $\dfrac{x^{33}y^{3}}{z^{15}}$ **d.** $\dfrac{z^{15}}{x^{33}y^{3}}$

Simplify. Assume that all variables represent positive real numbers. **21.** _____

21. $\sqrt{625x^8y^7}$

a. $25x^3y^4\sqrt{xy}$ **b.** $25x^4\sqrt{y^7}$

c. $25x^8y^7\sqrt{xy}$ **d.** $25x^4y^3\sqrt{y}$

22. $\sqrt[3]{81x^4y^2}+4x\sqrt[3]{3xy^2}$ **22.** _____

a. $7x\sqrt[3]{3xy^2}$ **b.** $12x^2\sqrt[3]{3xy^2}$

c. $7xy\sqrt[3]{3x}$ **d.** $12x^2y\sqrt[3]{9x^2y}$

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CHAPTER R, FORM F

23. $\left(2\sqrt{15}+5\sqrt{3}\right)\left(-3+\sqrt{5}\right)$ **23.** _____

a. $-\sqrt{15}-5\sqrt{3}$ **b.** $-11\sqrt{15}-5\sqrt{3}$
c. $-11\sqrt{15}-3\sqrt{5}$ **d.** $-\sqrt{15}-3\sqrt{5}$

24. Rationalize the denominator of $\dfrac{9}{\sqrt{17}+3\sqrt{2}}$. **24.** _____

a. $9\left(\sqrt{17}+3\sqrt{2}\right)$ **b.** $-9\left(\sqrt{17}-3\sqrt{2}\right)$
c. $-9\left(\sqrt{17}+3\sqrt{2}\right)$ **d.** $9\left(\sqrt{17}-3\sqrt{2}\right)$

25. Write the decimal 0.23 as a fraction and a percent. **25.** _____

a. $\dfrac{23}{100}, 23\%$ **b.** $\dfrac{23}{100}, 230\%$
c. $\dfrac{23}{10}, 23\%$ **d.** $\dfrac{23}{10}, 2.3\%$

26. One of the two solutions of a quadratic equation, x, can be found by the formula **26.** _____

$$x=\frac{-b+\sqrt{b^2-4ac}}{2a},$$

where a is the coefficient of the squared term, b is the coefficient of the linear term, and c is the constant term. Find one of the solutions if $a=6$, $b=13$, and $c=-8$.

a. 4 **b.** $\dfrac{1}{2}$ **c.** $\dfrac{-13+\sqrt{23}}{12}$ **d.** $\dfrac{-13-\sqrt{23}}{12}$

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CHAPTER 1, FORM A
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

Solve each equation.

1. $5+4(x-1)=2x+2(x+4)$ **1.** _____

2. $\dfrac{2x-9}{4}=2+\dfrac{x}{12}$ **2.** _____

3. $48x^2+12x=90$ **3.** _____

4. $3x^2=2(x-1)$ **4.** _____

5. $\dfrac{3x}{x-2}+\dfrac{1}{x+2}=\dfrac{-4}{x^2-4}$ **5.** _____

6. $\sqrt{x-1}+x=3$ **6.** _____

7. $\sqrt{x+3}+\sqrt{2-x}=3$ **7.** _____

8. $x^4-13x^2+36=0$ **8.** _____

9. $(x-5)^{2/3}+3(x-5)^{1/3}-4=0$ **9.** _____

10. $|x-1|+8=8$ **10.** _____

11. $|x-3|=|2x+3|$ **11.** _____

12. The formula for the surface area of an open topped rectangular box is $S=LW+2LH+2WH$ where S, H, W and L represent surface area, height, width, and length, respectively. Solve this formula for W. **12.** _____

Perform each operation. Give the answer in standard form.

13. $(1-3i)(2+5i)$ **13.** _____

14. $(8+2i)+(1-6i)-(3i-2)$ **14.** _____

15. $\dfrac{2+i}{7-5i}$ **15.** _____

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CHAPTER 1, FORM A

16. Simplify the following power of i: i^{73} **16.** _____

Solve each inequality. Give the answer using interval notation.

17. $x^2 + 4 > 5x$ **17.** _____

18. $0 \le 4 - \frac{1}{3}x < 2$ **18.** _____

19. $\frac{x}{7} - 3 > \frac{x-4}{3} + 1$ **19.** _____

20. $|2x - 1| \ge 3$ **20.** _____

21. $|4 - 2x| > 6$ **21.** _____

Solve each problem.

22. Ben invests $22,000, some at 2% and some at 4% annual interest. If he receives an annual return of $670, how much is invested at each rate? **22.** _____

23. Jack can paint his apartment in 12 hr. His wife Cheryl requires 20 hr to do the same job. How long would it take them to complete the job if they worked together? **23.** _____

24. A baseball is thrown straight upward with an initial speed of 64 ft/sec. The number of feet s above the ground after t seconds is given by the equation $x = -16t^2 + 64t$. At what times will the baseball be 48 ft above the ground? **24.** _____

25. The number y of students attending a local high school between 2008 and 2016 can be approximated by the model $y = 45.28x^2 - 37.6x + 585$, where $x = 0$ corresponds to 2008. Based on this model, in what year did the school have about 1550 students? **25.** _____

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CHAPTER 1, FORM B
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

Solve each equation.

1. $\frac{3}{5}x-2=2+\frac{3}{2}x$ **1.** _____

2. $2x(x+3)=-1$ **2.** _____

3. $\frac{2}{7}(x-4)-x=-4-\frac{3}{5}x$ **3.** _____

4. $(x-3)^2=-4$ **4.** _____

5. $\frac{2}{x+5}-\frac{3}{2x+1}=\frac{5}{6x+3}$ **5.** _____

6. $x^4-3x^2=4$ **6.** _____

7. $\sqrt{x+4}+\sqrt{2x}=2$ **7.** _____

8. $\sqrt[3]{x-1}=\sqrt[3]{x^2+2x-21}$ **8.** _____

9. $|x-2|=|3x+8|$ **9.** _____

10. $|3x-4|=x$ **10.** _____

11. $(x-2)^{2/3}+2(x-2)^{1/3}-8=0$ **11.** _____

12. $\left(\frac{x}{x-2}\right)^2-\frac{2x}{x-2}-15=0$ **12.** _____

Perform each operation. Give the answer in standard form.

13. $-(7-3i)+(4+i)-(-1+i)$ **13.** _____

14. $(4+2i)(-5+4i)$ **14.** _____

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CHAPTER 1, FORM B

15. $\dfrac{4-5i}{2+3i}$ **15.** _____

16. Simplify the following power of i: i^{94} **16.** _____

Solve each inequality. Give the answer using interval notation.

17. $6x^2 - 5x \le -1$ **17.** _____

18. $7 + \dfrac{x}{2} < \dfrac{x}{3} - x$ **18.** _____

19. $\dfrac{-3}{2-x} < 0$ **19.** _____

20. $|2x+5| < 4$ **20.** _____

21. $|2x-1| < 3$ **21.** _____

Solve each problem.

22. What weight of an alloy containing 10% silver must be melted with an alloy containing 60% silver to obtain 10 lb of an alloy containing 40% silver? **22.** _____

23. The cost of installing insulation in a particular two bedroom home is $2400. Present monthly heating costs average $200, but the insulation is expected to reduce heating costs by 10%. How many months will it take to recover the cost of the insulation? **23.** _____

24. The population y of a nearby town between 2010 and 2019 can be approximated by the model $y = 326.5x^2 - 780.3x + 5670$, where $x = 0$ corresponds to 2010. Based on this model, in what year was the population about 6250? **24.** _____

25. A ball is thrown upward from ground level with an initial velocity of 108 ft per sec. Its height h in feet after t seconds is given by the equation $h = -16t^2 + 108t$. At what times will the ball be 180 ft above the ground? **25.** _____

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CHAPTER 1, FORM C
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

Solve each equation.

1. $4x-3=-5x+6$ **1.** _____

2. $\frac{2}{5}+\frac{4}{10x+5}=\frac{7}{2x+1}$ **2.** _____

3. $(4x-1)^2+9=0$ **3.** _____

4. $(x+2)^2-48=1$ **4.** _____

5. $\frac{4x+1}{4}-\frac{x-4}{6}=\frac{2x}{5}-2$ **5.** _____

6. $\sqrt[3]{x^2-1}=2$ **6.** _____

7. $\sqrt{2x+3}-2=x$ **7.** _____

8. $6x^4-7x^2=-2$ **8.** _____

9. $3(2z-1)^2-11(2z-1)+10=0$ **9.** _____

10. $|x+4|=3x-8$ **10.** _____

11. $|7x+3|=11$ **11.** _____

12. Solve the following equation for x: $ax+2by=2az-5bx$ **12.** _____

Perform each operation. Give the answer in standard form.

13. $(-4+2i)-(16+8i)+(13-2i)$ **13.** _____

14. $(3+5i)(2-7i)$ **14.** _____

15. $\frac{4-2i}{-5i}$ **15.** _____

16. Simplify the following power of i: i^{68} **16.** _____

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CHAPTER 1, FORM C

Solve each inequality. Give the answer using interval notation.

17. $x^2 - 5x + 4 > 0$ **17.** _____

18. $\frac{3(4-5x)}{2} + 5x > 1$ **18.** _____

19. $\frac{x}{2x+1} < -4$ **19.** _____

20. $|7 - 3x| \le 2$ **20.** _____

21. $\left|\frac{2x+5}{3}\right| < 1$ **21.** _____

Solve each problem.

22. How many pounds of extra-lean hamburger that is 7% fat must be mixed with 30 pounds of hamburger that is 15% fat to obtain a mixture that is 10% fat? **22.** _____

23. A workman's basic hourly wage is \$44, but he receives one and a half times his hourly rate for any hours worked in excess of 40 hours per week. If his paycheck for the week is \$2352, how many hours of overtime did he work? **23.** _____

24. A ball is thrown upward from ground level with an initial velocity of 108 ft per sec. Its height h in feet after t seconds is given by the equation $h = -16t^2 + 108t$. At what time will the ball hit the ground? **24.** _____

25. The number of visitors y to a nearby state park between 2012 and 2019 can be approximated by the model $y = 172.35x^2 - 303.4x + 6972$, where $x = 0$ corresponds to 2012. Based on this model, in what year did the park have about 8500 visitors? **25.** _____

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CHAPTER 1, FORM D
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

Solve each equation.

1. $\frac{5}{6}(x+8)-\frac{2}{3}(x+6)=2x+10$ **1.** _____

2. $(x-2)(x-3)=(x+3)(x+4)$ **2.** _____

3. $(5x-3)^2=-49$ **3.** _____

4. $5x\left(x+\frac{1}{5}\right)=3$ **4.** _____

5. $\frac{7}{x-2}-\frac{6}{x^2-4}=\frac{3}{2x+4}$ **5.** _____

6. $\sqrt[3]{x^3-7}+1=x$ **6.** _____

7. $\sqrt{7x+2}=6-x$ **7.** _____

8. $x^4=256$ **8.** _____

9. $(x^2-4x)^2-36=9(x^2-4x)$ **9.** _____

10. $|7x-5|=-12$ **10.** _____

11. $|2x-3|=|3x-5|$ **11.** _____

12. Solve the following equation for C: $P+N=\frac{C+2}{C}$ **12.** _____

Perform each operation. Give the answer in standard form.

13. $(3+4i)(2+7i)$ **13.** _____

14. $(5+3i)+(2-4i)-(3-8i)$ **14.** _____

15. $\frac{2-\sqrt{-16}}{3+\sqrt{-1}}$ **15.** _____

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CHAPTER 1, FORM D

16. Simplify the following power of i: i^{-55} **16.** _____

Solve each inequality. Give the answer using interval notation.

17. $x^2 - 5x < -6$ **17.** _____

18. $3(x-2) \le 2(x+5)$ **18.** _____

19. $\dfrac{4}{x+1} < 1$ **19.** _____

20. $1 < |x-2| < 4$ **20.** _____

21. $|3x-9| < 10$ **21.** _____

Solve each problem.

22. How many gallons of a cream that is 22% butterfat must be mixed with milk that is 2% butterfat to get 20 gallons of milk containing 4% butterfat? **22.** _____

23. Kay invested $28,500 in two accounts, one paying 2.5% simple interest, and the other paying 3.5%. She received $877.50 in interest for 1 yr. How much did she invest each time? **23.** _____

24. An arrow is shot upward from a platform 40 ft high with an initial velocity of 224 ft per sec. Its height h in feet after t seconds is given by the equation $h = -16t^2 + 224t + 40$. At what times will the arrow be 424 ft above the ground? **24.** _____

25. The number y of students enrolled in a nearby state college between 2012 and 2018 can be approximated by the model $y = 36.28x^2 - 98.61x + 8605$, where $x = 0$ corresponds to 2012. Based on this model, in what year did the college have about 8800 students? **25.** _____

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CHAPTER 1, FORM E
COLLEGE ALGEBRA AND TRIGONOMETRY

NAME_____
DATE_____

Choose the best answer.

Solve each equation.

1. $2(x-1)+1=3(x-4)+5(1-2x)+6(1+x)$ **1.** _____

a. $\varnothing$ **b.** $\{0\}$ **c.** $\{1\}$ **d.** $\{2\}$

2. $-3x-2+6(x+1)=-5x-3$ **2.** _____

a. $\left\{\frac{7}{3}\right\}$ **b.** $\left\{-\frac{11}{8}\right\}$ **c.** $\left\{-\frac{7}{8}\right\}$ **d.** $\left\{\frac{11}{3}\right\}$

3. $5x\left(x+\frac{1}{5}\right)=3$ **3.** _____

a. $\left\{\frac{-4\pm\sqrt{10}}{12}\right\}$ **b.** $\left\{\frac{-4\pm\sqrt{10}}{6}\right\}$

c. $\left\{\frac{-4\pm\sqrt{22}}{6}\right\}$ **d.** $\left\{\frac{-8\pm\sqrt{10}}{6}\right\}$

4. $x^2+4x-5=0$ **4.** _____

a. $\left\{-\sqrt{5},\sqrt{5}\right\}$ **b.** $\{-5,1\}$

c. $\{-1,5\}$ **d.** $\{-5,0\}$

5. $\frac{9x}{4}-x=\frac{x}{8}-\frac{7}{2}$ **5.** _____

a. $\left\{\frac{28}{11}\right\}$ **b.** $\left\{-\frac{28}{11}\right\}$ **c.** $\left\{\frac{28}{9}\right\}$ **d.** $\left\{-\frac{28}{9}\right\}$

6. $\sqrt{14x-7}=x+3$ **6.** _____

a. $\{2\}$ **b.** $\{-4\}$ **c.** $\{4\}$ **d.** $\{-3\}$

7. $\sqrt[3]{x^2-3x}=\sqrt[3]{3x^2-2}$ **7.** _____

a. $\{3\}$ **b.** $\{-2\}$ **c.** $\left\{-2,\frac{1}{2}\right\}$ **d.** $\varnothing$

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ANSWERS

TO

CHAPTER TEST FORMS

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CHAPTER R, FORM A

1. **a.** $\{\sqrt{49}\}$

b. $\left\{-9.6, \frac{54}{7}, 0, 2.\overline{15}, \frac{16}{5}, \sqrt{49}\right\}$

c. $\{6\pi, \sqrt{13}\}$

2. $\frac{4}{49}$

3. **a.** distributive

b. inverse

c. associative

d. commutative

4. $9a^2+6ab+b^2-12a-4b+4$

5. $-3x^2-3x+2$

6. $2x^3-5x^2+7x-6$

7. $x^2-2xy+y^2-49$

8. $8x^3+60x^2+150x+125$

9. $3y^2-5y-8-\frac{16}{y^2-2}$

10. $\frac{x+3}{x^2}$

11. $\frac{2x^2+19x+1}{(x+4)(x-4)}$

12. 1

13. $\frac{x^2y^2}{11(x+y)}$

14. $\frac{10}{21}$

15. $(x+2)(x^2-2x+4)(y-2)(y+2)$

16. $8(a+2b)(a^2-2ab+4b^2)$

17. $x^2(2x-7)(3x+5)$

18. $(14x+9)(2x-1)$

19. $\frac{9}{25}$

20. $\frac{z^2}{x^{11/2}y^{9/2}}$

21. $2xyz\sqrt{x^2z}$

22. $24x\sqrt{7x}$

23. $7-3\sqrt[3]{4}+20\sqrt[3]{2}$

24. $-20-8\sqrt{7}$

25. 0.8, 80%

26. –70.6°F

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CHAPTER R, FORM B

1. **a.** $\{17, \sqrt{25}\}$

b. $\left\{17, 0, -\frac{12}{3}, \sqrt{25}\right\}$

c. $\{-\pi, \sqrt{3}\}$

2. $-\frac{16}{5}$

3. **a.** associative

b. commutative

c. identity

d. inverse

4. $9x^2 - 6xy + y^2 - 6x + 2y + 1$

5. $x^4 - 4y^2$

6. $-4x^2 + x$

7. $x^2 - 6x + 9 - y^2$

8. $8x^3 - 36x^2y + 54xy^2 - 27y^3$

9. $2x^3 - x^2 + x - 3 - \frac{6}{3x-2}$

10. $\frac{x-1}{x}$

11. $\frac{x^2+4x+5}{x(x+5)(x-5)}$

12. 3

13. $\frac{x^2-3x-4}{x^2+5x-3}$

14. $\frac{1}{19}$

15. $(8x+3)(x-7)$

16. $3(x+3)(x-3)(x+1)$

17. $y(x-1)(x^2+x+1)(y-4)(y+4)$

18. $3ab(2b-c)(2b+c)$

19. $\frac{16}{9}$

20. $\frac{a^{5/3}}{b^{10}c^2}$

21. $5x^8y^3z^5\sqrt{3y}$

22. $-3\sqrt{6x}$

23. $-54 - 9\sqrt[3]{5} + 8\sqrt[3]{25}$

24. $\frac{3\sqrt[3]{4}}{4}$

25. 1.6, 160%

26. approximately 55.6 mph

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CHAPTER R, FORM C

1. a. $\left\{\frac{70}{10}, -\frac{1}{8}, 0, \sqrt{64}, 1.\overline{23}, -4, 2.76\right\}$

b. $\left\{\frac{70}{10}, -\frac{1}{8}, -2\pi, 0, \sqrt{64}, \sqrt{19}, 1.\overline{23}, -4, 2.76\right\}$

c. $\left\{\frac{70}{10}, 0, \sqrt{64}\right\}$

2. $\frac{1}{10}$

3. a. commutative

b. inverse

c. distributive

d. associative

4. $x^2 - 8xy + 16y^2 + 4x - 16y + 4$

5. $2x^2 - x$

6. $6x^3 - 5x^2y + 6xy^2 + 8y^3$

7. $a^2 + 10a + 25 - 4b^2$

8. $64b^3 - 144b^2c + 108bc^2 - 27c^3$

9. $x^2 - 2 + \frac{-x^2 + 5}{x^3 - 2}$

10. $\frac{(2x-3)(3x+2)}{(x-2)(2x^2-3)}$

11. $\frac{(x+5)^2}{x+4}$

12. -1

13. $\frac{x}{2+x}$

14. $-\frac{72}{5}$

15. $(5x-2y)(2x-3y)$

16. $(x-2)(x+2)(x^2+4)$

17. $(a-2b)(a+2b)^2$

18. $2x^2(x-3y)(x+3y)$

19. $\frac{256}{81}$

20. $\frac{a^{39/2}}{b^6c^9}$

21. $4a^2b^6\sqrt{5ab}$

22. 0

23. $9x - 4y$

24. $-3\sqrt{3} + 3\sqrt{7}$

25. 2.4, 240%

26. approximately 42.7 mph

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CHAPTER R, FORM D

1. **a.** $\left\{\sqrt{49}, 8\right\}$

b. $\left\{-17.8, -3.\overline{6}, 0, -\frac{10}{2}, \sqrt{49}, \frac{5}{3}, 8\right\}$

c. $\left\{0, -\frac{10}{2}, \sqrt{49}, 8\right\}$

2. $\frac{1}{100}$

3. **a.** commutative

b. associative

c. identity

d. distributive

4. $4x^2 - 12xy + 9y^2 - 8x + 12y + 4$

5. $2x^4 - x^3 - 6x^2 + 7x - 2$

6. $x^4 + x^3 - x^2 + x - 2$

7. $r^2 + 4rs + 4s^2 - 16$

8. $8a^3 + 12a^2b + 6ab^2 + b^3$

9. $2y^2 - 2y - 5 - \frac{15}{y^2 - 3}$

10. $\frac{x+1}{5}$

11. $\frac{10}{(x-8)(x+7)}$

12. $\frac{1}{2-x}$

13. $\frac{x(3x+5)}{(x-2)(x+2)^2}$

14. $-\frac{4}{3}$

15. $(6x-1)(3x-4)$

16. $(3x^2 - 2)(2x^2 + 5)$

17. $(r-2s)^2(r^2 + 2rs + 4s^2)$

18. $8(x+2y)(x^2 - 2xy + 4y^2)$

19. $\frac{343}{64}$

20. $\frac{x^5 z^{13/2}}{y^{31/2}}$

21. $2a^7b^9c^2\sqrt{21c}$

22. $6x\sqrt[4]{3x}$

23. $-2 + 2\sqrt{15}$

24. $\frac{2\sqrt{3}}{9}$

25. -0.375, -37.5%

26. approximately 35.2 m

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CHAPTER R, FORM E

1. **A.** d **B.** c **C.** d
2. b
3. **A.** c **B.** d **C.** b **D.** a
4. b
5. c
6. c
7. b
8. c
9. d
10. d
11. b
12. c
13. b
14. c
15. d
16. d
17. c
18. c
19. c
20. a
21. c
22. c
23. b
24. c
25. a
26. a

CHAPTER R, FORM F

1. **A.** d **B.** b **C.** b
2. b
3. **A.** c **B.** a **C.** b **D.** c
4. b
5. c
6. d
7. d
8. d
9. d
10. c
11. b
12. b
13. c
14. b
15. a
16. b
17. a
18. c
19. a
20. b
21. d
22. a
23. a
24. b
25. a
26. b

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CHAPTER 1, FORM A

1. $\varnothing$
2. $\left\{\frac{51}{5}\right\}$
3. $\left\{-\frac{3}{2}, \frac{5}{4}\right\}$
4. $\left\{\frac{1}{3} \pm \frac{1}{3} i\sqrt{5}\right\}$
5. $\left\{-\frac{1}{3}\right\}$
6. $\{2\}$
7. $\{-2, 1\}$
8. $\{\pm 2, \pm 3\}$
9. $\{-59, 6\}$
10. $\{1\}$
11. $\{0, -6\}$
12. $W = \frac{S - 2LH}{L + 2H}$
13. $17 - i$
14. $11 - 7i$
15. $\frac{9}{74} + \frac{17}{74} i$
16. i
17. $(-\infty, 1) \cup (4, \infty)$
18. $(6, 12]$
19. $(-\infty, -14)$
20. $(-\infty, -1] \cup [2, \infty)$
21. $(-\infty, -1) \cup (5, \infty)$
22. \$10,500 at 2%; \$11,500 at 4%
23. $7\frac{1}{2}$ hr
24. 1 sec and 3 sec
25. 2013

CHAPTER 1, FORM B

1. $\left\{-\frac{40}{9}\right\}$
2. $\left\{\frac{-3 \pm \sqrt{7}}{2}\right\}$
3. $\{25\}$
4. $\{3 \pm 2i\}$
5. $\{-32\}$
6. $\{\pm 2, \pm i\}$
7. $\{0\}$
8. $\{-5, 4\}$
9. $\left\{-5, -\frac{3}{2}\right\}$
10. $\{1, 2\}$
11. $\{-62, 10\}$
12. $\left\{\frac{3}{2}, \frac{5}{2}\right\}$
13. $-2 + 3i$
14. $-28 + 6i$
15. $-\frac{7}{13} - \frac{22}{13} i$
16. -1
17. $\left[\frac{1}{3}, \frac{1}{2}\right]$
18. $(-\infty, -6)$
19. $(-\infty, 2)$
20. $\left(-\frac{9}{2}, -\frac{1}{2}\right)$
21. $(-1, 2)$
22. 4 lb
23. 120 months
24. 2013
25. 3 sec, 3.75 sec

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CHAPTER 1, FORM C

1. $\{1\}$
2. $\left\{\frac{29}{4}\right\}$
3. v
4. $\{5, -9\}$
5. $\left\{-\frac{175}{26}\right\}$
6. $\{-3, 3\}$
7. $\{-1\}$
8. $\left\{\frac{\pm\sqrt{2}}{2}, \frac{\pm\sqrt{6}}{3}\right\}$
9. $\left\{\frac{4}{3}, \frac{3}{2}\right\}$
10. $\{6\}$
11. $\left\{2, -\frac{8}{7}\right\}$
12. $x = \frac{2az - 3by}{a + 5b}$
13. $-7 - 8i$
14. $41 - 11i$
15. $\frac{2}{5} + \frac{4}{5}i$
16. 1
17. $(-\infty, 1) \cup (4, \infty)$
18. $(-\infty, 2)$
19. $\left(-\frac{1}{2}, -\frac{4}{9}\right)$
20. $\left[\frac{5}{3}, 3\right]$
21. $(-4, -1)$
22. 50 lb
23. 12 hr
24. $6\frac{3}{4}$ sec
25. 2016

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CHAPTER 1, FORM D

1. $\{-4\}$
2. $\left\{-\frac{1}{2}\right\}$
3. $\left\{\frac{3}{5} \pm \frac{7}{5}i\right\}$
4. $\left\{\frac{-1 \pm \sqrt{61}}{10}\right\}$
5. No solution
6. $\{2, -1\}$
7. $\{2\}$
8. $\{\pm 4, \pm 4i\}$
9. $\{-2, 1, 3, 6\}$
10. $\varnothing$
11. $\left\{2, \frac{8}{5}\right\}$
12. $C = \frac{2}{P + N - 1}$
13. $-22 + 29i$
14. $4 + 7i$
15. $\frac{1}{5} - \frac{7}{5}i$
16. i
17. $(-3, 2)$
18. $(-\infty, 16]$
19. $(-\infty, -1) \cup (3, \infty)$
20. $(-2, 1) \cup (3, 6)$
21. $\left(-\frac{1}{3}, \frac{19}{3}\right)$
22. 2 gal
23. \$16,500 at 3.5%; \$12,000 at 2.5%
24. 2 sec and 12 sec
25. 1987

CHAPTER 1, FORM E

1. b
2. c
3. b
4. b
5. d
6. c
7. c
8. c
9. a
10. d
11. d
12. b
13. b
14. b
15. c
16. a
17. a
18. d
19. a
20. c
21. c
22. c
23. b
24. c
25. c

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CHAPTER 1, FORM F

1. a
2. a
3. c
4. c
5. c
6. b
7. d
8. a
9. d
10. d
11. c
12. d
13. c
14. c
15. c
16. a
17. c
18. b
19. b
20. b
21. a
22. c
23. d
24. c
25. b

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CHAPTER 2, FORM A

1. **a.** B

b. G

c. A

d. D

e. A

f. A

g. A

h. B

i. A

j. H

2. $\frac{7}{4}$

3. $\sqrt{65}$

4. $\left(-3, \frac{1}{2}\right)$

5. $7x - 4y = -23$

6. $f(x) = \frac{7}{4}x + \frac{23}{4}$

7. Function; domain: $(-\infty, 0) \cup (0, \infty)$; range: $(0, \infty)$; increasing: $(-\infty, 0)$; decreasing: $(0, \infty)$

8. Not a function; domain: $[-7, \infty)$; range: $[-7, \infty)$

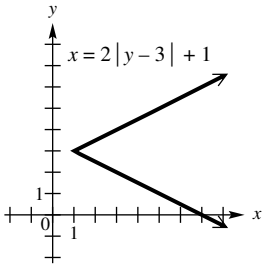
9. **a.** $x = \frac{3}{5}$

b. $y = \frac{4}{7}$

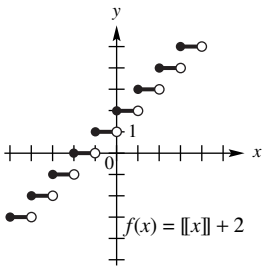
10. **a.** $y = 4x - 3$

b. $y = -\frac{1}{4}x + \frac{11}{2}$

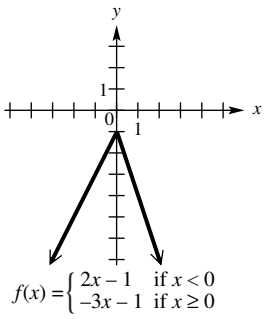
11.



12.



13.



14. Translate the graph of $y = \sqrt{x}$ to the left 3 units, stretch by a factor of $\frac{1}{2}$, reflect across the x-axis, and translate 5 units up.

15. **a.** Yes **b.** Yes **c.** Yes

16. $2x^3 + x^2 - 2x - 1$

17. $x^2 + 2x$

18. $x \neq 1,\ x \neq -1$

19. $2x + h$

20. -3

21. $\frac{3}{5}$

22. $4x^2 + 4x$

23. 8

24. $2x^2 - 1$

25. 7

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