Intermediate Algebra - Concepts and Applications 11th edition Bittinger Test Bank

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

Use mathematical symbols to translate the phrase. Use x to represent the unknown number. If there are two unknown numbers, use x and y to represent the numbers.

1) 3 more than some number

A) $x - 3$

B) $x + 3$

C) $\frac{3}{x}$

D) $3x$

Answer: B

2) 7 times a number

A) $7 - x$

B) $7x$

C) $7 + x$

D) $\frac{7}{x}$

Answer: B

3) Twice some number

A) $2 + x$

B) $2 - x$

C) $\frac{2}{x}$

D) $2x$

Answer: D

4) 6 less than a number

A) $6 - x$

B) $x - 6$

C) 6

D) $x - (-6)$

Answer: B

5) 26 percent of some number

A) $\frac{x}{26}$

B) $26x$

C) $\frac{26}{x}$

D) $0.26x$

Answer: D

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6) 13 more than half of some number

A) $\frac{x+13}{2}$

B) $x+\frac{13}{2}$

C) $\frac{13x}{2}$

D) $\frac{x}{2}+13$

Answer: D

7) 7 more than 26 percent of some number

A) $0.26x+7$

B) $\frac{0.07}{x+b}$

C) $26x+7$

D) $7x+26$

Answer: A

8) 3 less than the product of two numbers.

A) $xy-3$

B) $3x-3$

C) $x+y-3$

D) $3-xy$

Answer: A

9) 9 more than the difference of two numbers.

A) $\frac{x}{y}+9$

B) $x-y+9$

C) $9(x-y)$

D) $x+y-9$

Answer: B

10) 134 miles per every 7 gallons of gas.

A) $\frac{7}{134}$

B) $134 \cdot 7$

C) $134-7$

D) $\frac{134}{7}$

Answer: D

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Find the area of a square flower garden with the given length of a side.

11) Side = 4 ft

A) 17 ft^2

B) 16 ft^2

C) 9 ft^2

D) 8 ft^2

Answer: B

12) Side = 19 m

A) 3610 m^2

B) 38 m^2

C) 362 m^2

D) 361 m^2

Answer: D

13) Side = 0.8 ft

A) 0.64 ft^2

B) 0.064 ft^2

C) 6.4 ft^2

D) 64 ft^2

Answer: A

14) Side = 4.6 m

A) 2.116 m^2

B) 211.6 m^2

C) 21.16 m^2

D) 9.2 m^2

Answer: C

Find the area of a triangular window with the given base and height.

15) Base = 6 ft, height = 14 ft

A) 20 sq ft

B) 42 sq ft

C) 84 sq ft

D) 10 sq ft

Answer: B

16) Base = 4.4 ft, height = 6.5 ft

A) 28.6 sq ft

B) 14.3 sq ft

C) 10.9 sq ft

D) 5.45 sq ft

Answer: B

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17) Base = 19 m, height = 9.3 m

A) 28.3 sq m

B) 14.15 sq m

C) 88.35 sq m

D) 176.7 sq m

Answer: C

18) Base = 11 m, height = 11.8 m

A) 11.4 sq m

B) 64.9 sq m

C) 22.8 sq m

D) 129.8 sq m

Answer: B

Evaluate the expression.

19) $7x - y$, for $x = 10$ and $y = 19$

A) 51

B) 89

C) 123

D) 6

Answer: A

20) $12b \div 15a$, for $a = 6$ and $b = 5$

A) 900

B) $\frac{1}{4}$

C) $\frac{4}{25}$

D) 24

Answer: D

21) $10 - r^3 + s$, for $r = 4$ and $s = 17$

A) 15

B) - 37

C) - 4899

D) - 71

Answer: B

22) $6m^2p + 2p^4$, for $m = 3$ and $p = 4$

A) 5216

B) 546

C) 728

D) 140

Answer: C

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23) $5x \div (16 + x - y)$, for $x = 9$ and $y = 10$

A) $\frac{25}{9}$

B) $\frac{80}{3}$

C) 3

D) 36

Answer: C

24) $18 - (a - b)^2$, for $a = 2$ and $b = 4$

A) - 18

B) 14

C) 22

D) - 14

Answer: B

25) $m + n(6 + n^2)$, for $m = 11$ and $n = 18$

A) 13

B) 3197

C) 1415

D) 5951

Answer: D

26) $7(m + 12n) \div m$, for $m = 6$ and $n = 4$

A) 133

B) 138

C) 63

D) 68

Answer: C

27) $a^2 - 8(a - b)$, for $a = 2$ and $b = 9$

A) 28

B) 60

C) 25

D) - 21

Answer: B

28) $x - [y(2 - x)]^2$, for $x = 7$ and $y = 4$

A) 407

B) - 13

C) 27

D) - 393

Answer: D

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Use roster notation to write the set.

29) The set of natural numbers that are multiples of 4

A) {4, 8, 12, · · · }

B) {4, 16, 64, · · · }

C) {1, 2, 3, · · · }

D) {4, 8, 16, · · · }

Answer: A

30) The set of all odd natural numbers between 20 and 30

A) {22, 24, 26, 28}

B) {21, 29}

C) {21, 23, 25, 27, 29}

D) {21, 25, 29}

Answer: C

31) The set consisting of the first 5 even natural numbers

A) {1, 3, 5, 7, 9}

B) {0, 2, 4, 6, 8}

C) {1, 2, 3, 4, 5}

D) {2, 4, 6, 8, 10}

Answer: D

32) The set consisting of the first 5 odd natural numbers

A) {1, 2, 3, 4, 5}

B) {0, 1, 3, 5, 7}

C) {1, 3, 5, 7, 9}

D) {3, 5, 7, 9, 11}

Answer: C

33) The set of all integers that are not natural numbers

A) {0}

B) {0, 1, 2, 3, . . .}

C) {. . ., - 3, - 2, - 1, 0}

D) {. . ., - 3, - 2, - 1}

Answer: C

34) The integers

A) { 0, 1, 2, 3, . . . }

B) {- 3, - 2, - 1, 0, 1, 2, 3}

C) { 0, 1, 2, 3}

D) {. . ., - 3, - 2, - 1, 0, 1, 2, 3, . . . }

Answer: D

35) The integers between - 4 and 2

A) { - 1, 0, 1, 2}

B) {- 3, - 2, - 1, 0, 1}

C) {- 4 ,- 3, - 2, - 1, 0, 1, 2}

D) {- 4 ,- 3, - 2, 0, 1, 2}

Answer: B

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36) The integers between 8 and 14

A) {8,14}
B) {8, 9, 10, 11, 12, 13, 14}
C) {8, 9, 10, 11, 12, 13}
D) {9, 10, 11, 12, 13}

Answer: D

37) The natural- number multiples of 9 greater than 26 and less than 136

A) {27, 36, 45, ..., 135}
B) {27, 45, ..., 135}
C) {36, 45, ..., 135}
D) {26, 136}

Answer: A

Use set- builder notation to write the set.

38) The set of all odd numbers between - 20 and - 8

A) {- 19, - 17, - 15, - 13, - 11, - 9}
B) {- 18, - 16, - 14, - 12, - 10, - 8}
C) {x | x is an odd number between - 20 and - 8}
D) {- 20, - 18, - 16, - 14, - 12, - 10, - 8}

Answer: C

39) The set of all multiples of 6 between 24 and 56

A) {30, 36, 42, 48, 54}
B) {x | x is a multiple of 6 between 24 and 56}
C) {x | x = 6n, n is a whole number}
D) {24, 30, 36, 42, 48, 54}

Answer: B

40) {- 1, 0, 1, 2, 3}

A) {x | x is an integer greater than - 1 and less than 3}
B) {x | x is an integer greater than - 2 and less than 4}
C) {x | x is a natural number greater than - 2 and less than 4}
D) {x | x is a number between - 1 and 3}

Answer: B

41) {0, 1, 2, . . . , 7}

A) {x | x is an integer less than 8}
B) {x | x is a whole number less than 8}
C) {x | x is a natural number less than 8}
D) {x | x is a whole number less than 7}

Answer: B

42) {- 5, - 4, - 3, - 2, - 1, 0, 1, 2, 3, 4}

A) {x | x is an integer between, but not including, - 6 and 5}
B) {x | x is an integer between, but not including, - 5 and 4}
C) {x | x is a whole number between, but not including, - 6 and 5}
D) {x | x is a whole number between, but not including, - 5 and 4}

Answer: A

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Classify the number as one or more of the following: whole number, integer, rational number, irrational number, or real number.

43) 36

A) Whole number, integer, real number
B) Real number
C) Whole number, integer
D) Whole number, integer, rational number, real number

Answer: D

44) - 6

A) Whole number, integer, rational number, real number
B) Whole number, integer
C) Integer, rational number
D) Integer, rational number, real number

Answer: D

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

A) Rational number
B) Rational number, real number
C) Integer, rational number, real number
D) Real number

Answer: B

46) $\frac{7}{6}$

A) Rational number, real number
B) Rational number, irrational number, real number
C) Real number
D) Rational number

Answer: A

47) - 1.6

A) Rational number
B) Integer, rational number, real number
C) Rational number, real number
D) Real number

Answer: C

48) $-\sqrt{5}$

A) Rational number, real number
B) Irrational number, real number
C) Irrational number
D) Real number

Answer: B

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49) $1.\overline{72}$

A) Rational number
B) Irrational number
C) Irrational number, real number
D) Rational number, real number

Answer: D

Classify the statement as true or false. Consult the following list as needed.

$\mathbb{N}$ = the set of natural numbers
$\mathbb{W}$ = the set of whole numbers
$\mathbb{Z}$ = the set of integers
$\mathbb{Q}$ = the set of rational numbers
$\mathbb{H}$ = the set of irrational numbers
$\mathbb{R}$ = the set of real numbers

50) $87 \in \mathbb{N}$

A) True
B) False

Answer: A

51) $10.5 \in \mathbb{N}$

A) True
B) False

Answer: B

52) $\sqrt{33} \in \mathbb{Q}$

A) True
B) False

Answer: B

53) $22.8 \notin \mathbb{H}$

A) True
B) False

Answer: A

54) $282.7 \in \mathbb{Z}$

A) True
B) False

Answer: B

55) $48 \in \mathbb{R}$

A) True
B) False

Answer: A

56) $\mathbb{W} \subset \mathbb{N}$

A) True
B) False

Answer: B

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57) $\mathbb{W} \not\subset \mathbb{Z}$

A) True

B) False

Answer: B

58) $\mathbb{Q} \not\subset \mathbb{R}$

A) True

B) False

Answer: B

59) $\mathbb{Q} \subset \mathbb{Z}$

A) True

B) False

Answer: B

Find the absolute value.

60) $|-23|$

A) - 23

B) ±23

C) 0

D) 23

Answer: D

61) $|6|$

A) ±6

B) 6

C) 0

D) - 6

Answer: B

62) $|-11|$

A) - 11

B) 0

C) ±11

D) 11

Answer: D

63) $|-4|$

A) - 4

B) 0

C) 4

D) ±4

Answer: C

64) $|-21|$

A) 0

B) ±21

C) - 21

D) 21

Answer: D

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65) $|0|$

A) Not defined

B) 1

C) 0

D) - 1

Answer: C

66) $\left|\frac{17}{5}\right|$

A) $\pm\frac{17}{5}$

B) 0

C) $-\frac{17}{5}$

D) $\frac{17}{5}$

Answer: D

67) $|-3.72|$

A) ±3.72

B) 3.72

C) - 3.72

D) 0

Answer: B

68) $|5.7|$

A) ±5.7

B) 5.7

C) 0

D) - 5.7

Answer: B

69) $\left|3\frac{1}{2}\right|$

A) 0

B) $\pm 3\frac{1}{2}$

C) $3\frac{1}{2}$

D) $-3\frac{1}{2}$

Answer: C

Identify the inequality as true or false.

70) $-22 < 0$

A) True

B) False

Answer: A

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71) $27 < 0$
A) True
B) False
Answer: B

72) $-6 > -98$
A) True
B) False
Answer: A

73) $3 \leq 1$
A) True
B) False
Answer: B

74) $-9 \leq -12$
A) True
B) False
Answer: B

75) $2 \geq 18$
A) True
B) False
Answer: B

76) $-7 > 5$
A) True
B) False
Answer: B

77) $-9 \leq 5$
A) True
B) False
Answer: A

78) $4 \leq 4$
A) True
B) False
Answer: A

79) $-9 > -9$
A) True
B) False
Answer: B

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Add.

80) 8 + (- 11)

A) - 3
B) 3
C) - 19
D) 19

Answer: A

81) - 18 + 12

A) - 6
B) 6
C) - 30
D) 30

Answer: A

82) - 17 + (- 3)

A) - 20
B) 14
C) - 14
D) 20

Answer: A

83) - 9.7 + (- 6.7)

A) 3
B) - 16.4
C) 16.4
D) - 3

Answer: B

84) $\frac{1}{2} + \left(- \frac{1}{5} \right)$

A) $\frac{7}{10}$

B) $- \frac{3}{10}$

C) $\frac{3}{10}$

D) $- \frac{7}{10}$

Answer: C

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85) $\frac{13}{44} + \left(-\frac{13}{44}\right)$

A) $\frac{13}{22}$

B) $\frac{13}{11}$

C) $-\frac{13}{22}$

D) 0

Answer: D

86) $\left(-\frac{1}{3}\right) + \left(\frac{1}{12}\right)$

A) $-\frac{1}{18}$

B) $-\frac{1}{4}$

C) $\frac{1}{4}$

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

Answer: B

87) $\left(-\frac{1}{3}\right) + \left(\frac{1}{5}\right)$

A) $-\frac{2}{15}$

B) $\frac{2}{15}$

C) $-\frac{1}{5}$

D) $\frac{1}{30}$

Answer: A

88) (0.3) + (- 2.2)

A) 2.5

B) - 1.9

C) - 0.66

D) - 2.5

Answer: B

89) - 3.62 + (- 6.51)

A) 23.566

B) - 2.89

C) - 10.13

D) 10.13

Answer: C

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Find the opposite, or additive inverse.

90) 10

A) 0
B) - 10
C) - 1
D) 10

Answer: B

91) - 16

A) 16
B) - 1
C) - 16
D) 0

Answer: A

92) $-\frac{4}{5}$

A) 0
B) $\frac{4}{5}$
C) - 1
D) $-\frac{4}{5}$

Answer: B

93) 0

A) Not Defined
B) 1
C) 0
D) - 10

Answer: C

94) $2\frac{1}{3}$

A) $-2\frac{1}{3}$
B) 0
C) $2\frac{1}{3}$
D) $\frac{3}{7}$

Answer: A

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95) $3\frac{1}{5}$

A) - 35

B) $\frac{5}{16}$

C) $-3\frac{1}{5}$

D) 0

Answer: C

96) 4.35

A) 3.65

B) 4.35

C) - 3.65

D) - 4.35

Answer: D

Find - x.

97) x = - 16

A) - 16

B) 0

C) 16

D) $\frac{1}{-16}$

Answer: C

98) x = 41

A) - 41

B) 0

C) 41

D) $\frac{1}{41}$

Answer: A

99) x = 0

A) Not defined

B) - 10

C) 0

D) - 1

Answer: C

100) x = - 1.5

A) 0

B) - 2.5

C) - 1.5

D) 1.5

Answer: D

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101) x = 0.12
A) 0.12
B) - 0.88
C) 0
D) - 0.12

Answer: D

Subtract.

102) 2 - 9
A) 7
B) - 11
C) 11
D) - 7

Answer: D

103) - 11 - 15
A) 26
B) - 26
C) 4
D) - 4

Answer: B

104) - 14 - (- 11)
A) 3
B) - 25
C) - 3
D) 25

Answer: C

105) 14 - (- 6)
A) - 20
B) 8
C) 20
D) - 8

Answer: C

106) - 6.8 - 13.1
A) 19.9
B) - 19.9
C) 6.3
D) - 6.3

Answer: B

107) - 11.9 - (- 10.2)
A) 22.1
B) - 1.7
C) 1.7
D) - 22.1

Answer: B

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108) $\frac{1}{10} - \left(-\frac{1}{5}\right)$

A) $-\frac{3}{10}$

B) $\frac{3}{10}$

C) $-\frac{1}{10}$

D) $\frac{1}{10}$

Answer: B

109) $-\frac{3}{4} - \frac{5}{8}$

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

B) $-\frac{11}{8}$

C) $\frac{11}{8}$

D) - 1

Answer: B

110) $-\frac{3}{4} - \left(-\frac{5}{8}\right)$

A) $\frac{1}{8}$

B) - 1

C) $-\frac{1}{4}$

D) $-\frac{1}{8}$

Answer: D

111) $-\frac{3}{5} - \frac{4}{3}$

A) $-\frac{7}{8}$

B) $-\frac{29}{15}$

C) $-\frac{11}{15}$

D) $\frac{29}{15}$

Answer: B

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Multiply.

112) $(50)(-22)$

A) 1100
B) -1200
C) -1100
D) -1150

Answer: C

113) $(-38)(-5)$

A) 228
B) 190
C) 1900
D) 90

Answer: B

114) $(-30) \cdot 0$

A) 0
B) -30
C) 1
D) 30

Answer: A

115) $\frac{8}{3}(-1)$

A) $\frac{8}{3}$

B) $\frac{3}{8}$

C) $\frac{-3}{8}$

D) $\frac{-8}{3}$

Answer: D

116) $\left(-\frac{8}{7}\right)\left(\frac{5}{9}\right)$

A) $\frac{40}{63}$

B) $-\frac{1}{21}$

C) $-\frac{40}{63}$

D) $-\frac{72}{35}$

Answer: C

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117) $\left(\frac{5}{7}\right)\left(-\frac{2}{3}\right)$

A) $\frac{10}{21}$

B) $-\frac{10}{21}$

C) $-\frac{1}{63}$

D) $-\frac{15}{14}$

Answer: B

118) $\frac{8}{7}\left(\frac{7}{3}\right)$

A) $\frac{8}{3}$

B) $-\frac{8}{21}$

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

D) $\frac{49}{24}$

Answer: A

119) (- 6)(- 5.4)

A) 32.4

B) 3.24

C) - 3.24

D) - 32.4

Answer: A

120) (- 6.2) · 0

A) 1

B) 0

C) - 6.2

D) 6.2

Answer: B

121) 22.99 × 0

A) 0

B) 22.99

C) 0.2299

D) 1

Answer: A

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Divide.

122) $\frac{-91}{7}$

A) -23
B) 13
C) $-\frac{1}{13}$
D) -13

Answer: D

123) $\frac{28}{-2}$

A) 14
B) -24
C) -14
D) $-\frac{1}{14}$

Answer: C

124) $\frac{-150}{-5}$

A) 30
B) -30
C) $\frac{1}{30}$
D) 20

Answer: A

125) $\frac{0}{-77}$

A) Undefined
B) Indeterminate
C) 0
D) -77

Answer: C

126) $\frac{-49}{0}$

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

Answer: D

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Find the reciprocal, or multiplicative inverse.

127) - 8

A) $-\frac{1}{8}$

B) 1

C) $\frac{1}{8}$

D) 8

Answer: A

128) - 4

A) 4

B) $\frac{1}{4}$

C) 0

D) $-\frac{1}{4}$

Answer: D

129) $\frac{9}{8}$

A) $\frac{8}{9}$

B) $-\frac{8}{9}$

C) 1

D) $-\frac{9}{8}$

Answer: A

130) $-\frac{5}{9}$

A) $\frac{5}{9}$

B) $\frac{9}{5}$

C) 1

D) $-\frac{9}{5}$

Answer: D

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Divide.

131) $\frac{8}{15} \div \left(-\frac{1}{2}\right)$

A) $\frac{16}{15}$

B) $-\frac{16}{15}$

C) $-\frac{4}{15}$

D) $\frac{15}{16}$

Answer: B

132) $\frac{5}{8} \div \frac{10}{9}$

A) $\frac{7}{40}$

B) $\frac{7}{9}$

C) $\frac{3.518437209e+15}{5.066549581e+15}$

D) $\frac{9}{16}$

Answer: D

133) $-\frac{8}{9} \div \frac{1}{5}$

A) $-\frac{4}{7}$

B) $-\frac{9}{40}$

C) $-\frac{40}{9}$

D) $-\frac{8}{45}$

Answer: C

134) $\left(-\frac{6}{5}\right) \div (-24)$

A) 20

B) $\frac{5.066549581e+15}{1.759218604e+14}$

C) $\frac{1.759218604e+14}{5.066549581e+15}$

D) $\frac{1}{20}$

Answer: D

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135) $\left(-\frac{7}{6}\right) \div (-1)$

A) $-\frac{7}{6}$

B) $\frac{6}{7}$

C) $\frac{7}{6}$

D) $-\frac{6}{7}$

Answer: C

Calculate using the rules for order of operations.

136) $9 - (10 - 2 \cdot 10^2)$

A) - 181

B) 199

C) 399

D) - 201

Answer: B

137) $\frac{4 \cdot 9 - 6^3}{7 + -5 \cdot 10}$

A) $-\frac{3.166593488e+15}{1.002754605e+15}$

B) $-\frac{4.433230883e+15}{7.564639999e+14}$

C) $\frac{3.571213767e+15}{7.564639999e+14}$

D) $\frac{3.166593488e+15}{7.564639999e+14}$

Answer: D

138) $\frac{8^2 - (9 - 4^2)}{5^4 - 7}$

A) $\frac{5.488762046e+15}{8.69757678e+16}$

B) $\frac{8.022036836e+14}{8.69757678e+15}$

C) $\frac{4.996180837e+15}{4.34878839e+16}$

D) $\frac{9.147936743e+14}{1.44959613e+16}$

Answer: C

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139) $7^2 - [3(4^2 - 4^2 - 6)]^2$

A) - 627
B) 157
C) - 275
D) - 59

Answer: C

140) $\left|2^2 - 7\right|^3 - 5$

A) 22
B) 1326
C) - 2
D) 334

Answer: A

141) $\left|7 + 2\right| \cdot 8^3 - 1$

A) 4607
B) 2561
C) 2559
D) - 2561

Answer: C

142) $50 - (-3)^2 + 32 \div (-3) \cdot 2$

Round to two decimal places, if necessary.

A) - 15.17
B) - 12.17
C) 19.67
D) 37.67

Answer: C

143) $27 - (-4 + 9)^2 + 23 \div -4 \cdot 7$

Round to two decimal places, if necessary.

A) - 2.68
B) - 0.89
C) 11.75
D) - 38.25

Answer: D

144) $16 - \sqrt{-5 + 9} + 5 \div 3 \cdot 10^2$

Round to two decimal places, if necessary.

A) 0.06
B) 14.02
C) 633.33
D) 180.67

Answer: D

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145) $18 - 1 + \sqrt{5 + 2^2} \div 2 + (-3)^3$

Round to two decimal places, if necessary.

A) - 17.00

B) - 8.50

C) 16.88

D) - 0.80

Answer: B

Write an equivalent expression using a commutative or associative law, as indicated.

146) $(6x + 7y) + 7z$; associative

A) $6x + 7y + 7z$

B) $6x + (7y + 7z)$

C) $(6x + 7y + 7z)$

D) $(7y + 6x) + 7z$

Answer: B

147) $7x + 2y$; commutative

A) $2y + 7x$

B) $\frac{x}{7} + 2y$

C) $7x + \frac{y}{2}$

D) $\frac{x}{7} + \frac{y}{2}$

Answer: A

148) $4x$; commutative

A) $4 + x$

B) $x4$

C) $\frac{1}{4}$

D) -4

Answer: B

149) $x + (5y + 2)$; associative

A) $x + (2 + 5y)$

B) $x + (\frac{y}{5} + 2)$

C) $(x + 5y) + 2$

D) $(5y + 2) + x$

Answer: C

150) $5 + x$; commutative

A) $-x - 5$

B) $x + 5$

C) $x - 5$

D) $5 - x$

Answer: B

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151) (5x + 5y) + 2z; associative
A) 5x + 5y + 2z
B) (5x + 5y + 2z)
C) (5y + 5x) + 2z
D) 5x + (5y + 2z)

Answer: D

152) (8p)q; associative
A) 8(pq)
B) p(8q)
C) q(8p)
D) (p8)q

Answer: A

Write an equivalent expression using the distributive law.

153) 4(r + k)
A) 4r + k
B) r(4 + k)
C) 4r + 4k
D) 4r - 4k

Answer: C

154) - 7(x + 1)
A) 7x - 7
B) - 7x + 1
C) - 7x - 7
D) x - 7

Answer: C

155) 7(k - 3)
A) k - 21
B) 7k + 21
C) 7k - 3
D) 7k - 21

Answer: D

156) - 5(x + 8)
A) x - 40
B) - 5x + 8
C) - 5x - 40
D) 5x - 40

Answer: C

157) - 10(8z + 9m)
A) 80z - 90m
B) - 80z - 90m
C) 80z - 9m
D) - 80z + 90m

Answer: B

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158) - 11(6z - m)
A) - 66z - 11m
B) - 66z - m
C) 6z + 11m
D) - 66z + 11m
Answer: D

159) 7z(x - w - y)
A) 7zx - 7w - 7y
B) 7zx - 7zw - 7zy
C) 7zx - w - y
D) 7zx - 7zw - y
Answer: B

Find an equivalent expression by factoring.

160) 10x + 4
A) 2(5x + 4)
B) 10(x + 4)
C) 2(5x + 2)
D) 10(x + 2)
Answer: C

161) 6x + 6y
A) 12xy
B) 12x
C) (6 + 6)(x + y) = 12(x + y)
D) 6(x + y)
Answer: D

162) 2p - 4
A) - 2p
B) 4(p - 1)
C) 2(p - 2)
D) 2(p - 4)
Answer: C

163) 5x - 15y
A) 5(x - 15y)
B) - 10xy
C) 5(1 - 3y)
D) 5(x - 3y)
Answer: D

164) 6x - 6y + 6z
A) - 6(x - y + z)
B) 6(x + y + z)
C) 6z
D) 6(x - y + z)
Answer: D

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165) w + wz
A) w(1 + wz)
B) z(1 + w)
C) w(w + z)
D) w(1 + z)
Answer: D

166) 20a + 5b
A) 5(4a + 5b)
B) 20(a + b)
C) 4(5a + 5b)
D) 5(4a + b)
Answer: D

167) 3m - 6n + 15
A) 3(m - 2n + 5)
B) 3(m - 2n + 15)
C) 3(m - 6n + 15)
D) 6(3m - n + 15)
Answer: A

168) 3 + 12a + 21b
A) 3(1 + 4a + 7b)
B) 3(0 + 4a + 7b)
C) 3(1 + 12a + 21b)
D) 12(1 + a + b)
Answer: A

169) ar - as + at
A) r(a - s + t)
B) a(r + s + t)
C) a(r - s + t)
D) ar(1 - s + t)
Answer: C

Classify the following as either a pair of equivalent equations or a pair of equivalent expressions.

170) 2x - 10, 2(x - 5)
A) Equivalent equations
B) Equivalent expressions
Answer: B

171) 7(y - 5) = 10, 7y - 35 = 10
A) Equivalent expressions
B) Equivalent equations
Answer: B

172) 2(r + 8), 2r + 16
A) Equivalent expressions
B) Equivalent equations
Answer: A

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173) $3x + 24 = 13, 3(x + 8) = 13$
A) Equivalent equations
B) Equivalent expressions
Answer: A

174) $3x - 8 = 5, 3x = 13$
A) Equivalent equations
B) Equivalent expressions
Answer: A

175) $5x - 5, 7x - 5 - 2x$
A) Equivalent expressions
B) Equivalent equations
Answer: A

176) $6t + 6 - 3t + 2, 3t + 8$
A) Equivalent expressions
B) Equivalent equations
Answer: A

177) $8x - 3 + 3x = 5, 11x = 8$
A) Equivalent equations
B) Equivalent expressions
Answer: A

Determine whether the two equations in the pair are equivalent.

178) $6x = 12$ and $7x = 14$
A) Equivalent
B) Not equivalent
Answer: A

179) $8x = 32$ and $5x = 10$
A) Equivalent
B) Not equivalent
Answer: B

180) $8x = 40$ and $x + 7 = 9$
A) Not equivalent
B) Equivalent
Answer: A

181) $9x = 54$ and $x + 10 = 16$
A) Not equivalent
B) Equivalent
Answer: B

182) $6 - x = -4$ and $5x = 50$
A) Equivalent
B) Not equivalent
Answer: A

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183) $6x - 5 = 7$ and $3x = 6$

A) Not equivalent

B) Equivalent

Answer: B

184) $7x - 7 = 14$ and $8x = 64$

A) Not equivalent

B) Equivalent

Answer: A

185) $7x - 6 = 8$ and $5x = 45$

A) Equivalent

B) Not equivalent

Answer: B

186) $4x = 8x$ and $\frac{9}{x} = 72$

A) Not equivalent

B) Equivalent

Answer: A

187) $45x = 9x$ and $4 = \frac{6}{5 - x}$

A) Not equivalent

B) Equivalent

Answer: A

Solve the equation.

188) $8x = 32$

A) 4

B) 256

C) 12

D) - 4

Answer: A

189) $8r + 6 = 86$

A) 72

B) 76

C) 10

D) 4

Answer: C

190) $7n - 10 = 53$

A) 9

B) 17

C) 60

D) 56

Answer: A

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191) $-1 = 2x - 7$

A) 4
B) 3
C) 6
D) 8

Answer: B

192) $48 = 8x - 8$

A) 7
B) 52
C) 48
D) 14

Answer: A

193) $\frac{1}{6}f - 4 = 1$

A) - 18
B) 18
C) 30
D) - 30

Answer: C

194) $y + 6.5 = -7.1$

A) - 0.6
B) - 13.6
C) 13.6
D) 0.6

Answer: B

195) $z - 3.7 = -6.9$

A) 3.2
B) 10.6
C) - 3.2
D) - 10.6

Answer: C

Simplify by combining like terms.

196) $-10b + 6b$

A) $-4b$
B) $4b^2$
C) $4b$
D) $16b$

Answer: A

197) $-9xy + 5xy$

A) $-4xy$
B) $-4 + xy$
C) $-4x^2y^2$
D) $14xy$

Answer: A

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198) $5y^2 + y^2$

A) $6y^4$

B) $6y^2$

C) $5y^2$

D) $5y^4$

Answer: B

199) $12z - z$

A) $11z^2$

B) $12z - 1$

C) $-12z^2$

D) $11z$

Answer: D

200) $7x - 3x + 2x$

A) $12x$

B) $8x$

C) $2x$

D) $6x$

Answer: D

201) $10z - 2z^2 + 10z$

A) $20z - 2z^2$

B) $8z^2 + 10z$

C) $18z^2$

D) $18z$

Answer: A

202) $4x + 8x^2 - x + 7x^2$

A) $4x + 15x^2 - x$

B) $3x + 15x^2$

C) $18x^2$

D) $18x$

Answer: B

203) $9p^2 + 8p^3 - 3p^2 - 3p^3$

A) $11p^2$

B) $11p^2p^3$

C) $17p^2 - 6p^3$

D) $6p^2 + 5p^3$

Answer: D

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204) $5x - 4 + 7x + 14$

A) $22x$

B) $12x + 10$

C) 22

D) $12x^2 + 10$

Answer: B

205) $-4x^2 + 4x^3 + 9x - x^2 + 3x - x^3$

A) $3x^3 - 5x^2 + 12x$

B) $4x^3 - 4x^2 + 12x$

C) $3x^3 - 5x^2 + 9x$

D) $4x^3 - 4x^2 + 12x - x^3 - x^2$

Answer: A

Simplify by using the distributive law and combining like terms.

206) $x - (10x + 2)$

A) $-9x + 2$

B) $-11x$

C) $-9x - 2$

D) $9x - 2$

Answer: C

207) $8x - (7 - 2x)$

A) $10x + 7$

B) $6x - 7$

C) $8x - 9$

D) $10x - 7$

Answer: D

208) $8x - 5 - (7 - 2x)$

A) $10x - 2$

B) $6x - 2$

C) $10x - 12$

D) $6x - 12$

Answer: C

209) $8x - (5x - 6) - (-6x + 1)$

A) $9x - 7$

B) $19x + 5$

C) $9x + 7$

D) $9x + 5$

Answer: D

210) $6x - 2(-6x - 4)$

A) $-12x - 8$

B) $12x + 8$

C) $18x - 4$

D) $18x + 8$

Answer: D

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211) $4(3m + 5) - 5(4m - 3)$

A) $-8m + 5$

B) $-8m + 2$

C) $-8m + 35$

D) $7m + 35$

Answer: C

212) $-3(2t + 4) + 5(3t + 2) + 4t$

A) $18t - 2$

B) $13t + 18$

C) $18t + 6$

D) $13t - 2$

Answer: D

213) $3x - [4 - 6(8x - 2)]$

A) $51x - 6$

B) $-45x - 16$

C) $-45x + 8$

D) $51x - 16$

Answer: D

214) $3\{-5y + 2[6 - 2(5y + 6)]\}$

A) $-45y + 108$

B) $-75y + 108$

C) $-75y - 36$

D) $-45y - 18$

Answer: C

215) $4p - \{3[5(5p - 9) - (4p + 5)] + 9\}$

A) $-59p + 141$

B) $-83p + 141$

C) $-59p + 33$

D) $-83p + 159$

Answer: A

Solve the equation.

216) $8y - 1 = 8 - 5y$

A) $\frac{9}{13}$

B) $\frac{13}{9}$

C) $\frac{3}{7}$

D) $-\frac{13}{9}$

Answer: A

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217) $8x + 2x = 70$

A) 8.5
B) 7
C) 8
D) 60

Answer: B

218) $3x - 7x = -68$

A) 18
B) - 64
C) - 20.333
D) 17

Answer: D

219) $7x - 8 + 2x = 9x + 1 - 3x$

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

Answer: B

220) $\frac{1}{2}a - \frac{1}{2} = -2$

A) - 5
B) - 3
C) 5
D) 3

Answer: B

221) $\frac{1}{4}p - \frac{3}{8}p = 3$

A) 21
B) - 24
C) 24
D) - 21

Answer: B

Solve.

222) $38(x - 152) = 76$

A) 76
B) 152
C) 154
D) 150

Answer: C

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223) $8x - (7x - 1) = 2$

A) $-\frac{1}{15}$

B) 1

C) - 1

D) $\frac{1}{15}$

Answer: B

224) $3(4x - 1) = 12$

A) $\frac{11}{12}$

B) $\frac{3}{4}$

C) $\frac{5}{4}$

D) $\frac{13}{12}$

Answer: C

225) $12(8t - 7) = 7t - 8$

A) $\frac{76}{89}$

B) $-\frac{76}{89}$

C) $\frac{92}{89}$

D) $\frac{76}{103}$

Answer: A

226) $2(2z - 5) = 3(z + 5)$

A) 7

B) 25

C) - 5

D) 5

Answer: B

227) $5x + 5(-3x - 5) = -33 - 2x$

A) $\frac{29}{4}$

B) 1

C) $\frac{29}{6}$

D) - 1

Answer: B

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228) $3x - (4 - x) = 7[3 - (9 + 7x - 5)]$

A) $-\frac{73}{51}$

B) $-\frac{3}{53}$

C) $\frac{1}{15}$

D) $-\frac{73}{53}$

Answer: B

229) $-[x - (-9x + 1)] = 6 - (-4x + 1)$

A) $-\frac{8}{13}$

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

C) $-\frac{3}{7}$

D) $-\frac{2}{7}$

Answer: D

230) $\frac{1}{5}(r + 6) = \frac{1}{7}(r + 8)$

A) 2
B) - 2
C) - 1
D) 1

Answer: C

231) $\frac{1}{2}(4x - 10) = \frac{1}{4}(20x - 8)$

A) 1
B) - 10
C) - 1
D) $\frac{1}{10}$

Answer: C

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

232) $28m + 16 = 4(5m + 8)$

A) Identity; {all real numbers}
B) Contradiction; ∅
C) Conditional; {- 6}
D) Conditional; {2}

Answer: D

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233) 4(12t + 4) = 8(4t - 4)
A) Identity; {all real numbers}
B) Conditional; {- 3}
C) Contradiction; ∅
D) Conditional; {1}

Answer: B

234) 5(2f - 31) = 10f - 155
A) Identity; {all real numbers}
B) Contradiction; ∅
C) Conditional; {0}
D) Identity; ∅

Answer: A

235) 6(x - 2) + (- 12x) = - 6(x - 2) + 12
A) Conditional; {0}
B) Identity; {all real numbers}
C) Contradiction; ∅
D) Conditional; {4}

Answer: C

236) 24(x + 1) = 2(12x + 1) + 22
A) Conditional; {24}
B) Conditional; {0}
C) Contradiction; ∅
D) Identity; {all real numbers}

Answer: D

237) 4(3g + 35) - 12g - 140 = 0
A) Contradiction; ∅
B) Conditional; {3}
C) Identity; {all real numbers}
D) Conditional; {0}

Answer: C

238) 12k + 71 = 3(4k + 23)
A) Conditional; {- 4}
B) Conditional; {4}
C) Identity; {all real numbers}
D) Contradiction; ∅

Answer: D

239) - 8s - 71 + 4(2s + 20) = 0
A) Identity; {all real numbers}
B) Conditional; {2}
C) Conditional; {1}
D) Contradiction; ∅

Answer: D

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240) $3x + 9(x + 1) + 2 = 11 - 5x$

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

Answer: A

241) $2[3 - (5 - 5r)] - r = -10 + 3(2 + 3r)$

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

Answer: B

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1) B
2) B
3) D
4) B
5) D
6) D
7) A
8) A
9) B
10) D
11) B
12) D
13) A
14) C
15) B
16) B
17) C
18) B
19) A
20) D
21) B
22) C
23) C
24) B
25) D
26) C
27) B
28) D
29) A
30) C
31) D
32) C
33) C
34) D
35) B
36) D
37) A
38) C
39) B
40) B
41) B
42) A
43) D
44) D
45) B
46) A
47) C
48) B
49) D
50) A

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51) B
52) B
53) A
54) B
55) A
56) B
57) B
58) B
59) B
60) D
61) B
62) D
63) C
64) D
65) C
66) D
67) B
68) B
69) C
70) A
71) B
72) A
73) B
74) B
75) B
76) B
77) A
78) A
79) B
80) A
81) A
82) A
83) B
84) C
85) D
86) B
87) A
88) B
89) C
90) B
91) A
92) B
93) C
94) A
95) C
96) D
97) C
98) A
99) C
100) D

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

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151) D
152) A
153) C
154) C
155) D
156) C
157) B
158) D
159) B
160) C
161) D
162) C
163) D
164) D
165) D
166) D
167) A
168) A
169) C
170) B
171) B
172) A
173) A
174) A
175) A
176) A
177) A
178) A
179) B
180) A
181) B
182) A
183) B
184) A
185) B
186) A
187) A
188) A
189) C
190) A
191) B
192) A
193) C
194) B
195) C
196) A
197) A
198) B
199) D
200) D

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201) A
202) B
203) D
204) B
205) A
206) C
207) D
208) C
209) D
210) D
211) C
212) D
213) D
214) C
215) A
216) A
217) B
218) D
219) B
220) B
221) B
222) C
223) B
224) C
225) A
226) B
227) B
228) B
229) D
230) C
231) C
232) D
233) B
234) A
235) C
236) D
237) C
238) D
239) D
240) A
241) B

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

Translate the situation into mathematical language. You need not actually solve the problem.

1) The sum of two numbers is 65. One of the numbers is 9 more than the other. What are the numbers?
   A) Let x and x + 9 represent the numbers; $x + (x + 9) = 65$
   B) Let x and 9x represent the numbers; $x + 9x = 65$
   C) Let x and x - 9 represent the numbers; $x + (x + 9) = 65$
   D) Let x and x + 9 represent the numbers; $x(x + 9) = 65$

   Answer: A

2) One number is less than another by 66. The sum of the numbers is 90. What are the numbers?
   A) Let x and x - 66 represent the numbers; $x(x - 66) = 90$
   B) Let x and 66 - x represent the numbers; $x + (66 + x) = 90$
   C) Let x and x - 66 represent the numbers; $x + (x - 66) = 90$
   D) Let x and 66 - x represent the numbers; $x(66 - x) = 90$

   Answer: C

3) A rectangle's length is three times its width and its perimeter is 47 m. Find the dimensions of the rectangle.
   A) Let w represent the rectangle's width; $47 = 2w + 2(3w)$
   B) Let w represent the rectangle's width; $47 = w(3w)$
   C) Let w represent the rectangle's width; $47 = 2w + 2w$
   D) Let w represent the rectangle's width; $47 = w + 3w$

   Answer: A

4) A rectangle's width is one- sixth its length and its perimeter is 41 m. Find the dimensions of the rectangle.
   A) Let x represent the rectangle's length; $41 = x\left(\frac{1}{6}x\right)$
   B) Let x represent the rectangle's length; $41 = 2x + 2\left(\frac{1}{6}x\right)$
   C) Let x represent the rectangle's length; $41 = 2x + 2(6x)$
   D) Let x represent the rectangle's length; $41 = x + \frac{1}{6}x$

   Answer: B

5) Find two consecutive integers such that 2 times the first plus 6 times the second is 78.
   A) Let h be the first integer; $2h + 6(h + 1) = 78$
   B) Let h be the first integer; $6h(2(h + 1)) = 78$
   C) Let h be the first integer; $6h + 2(h + 1) = 78$
   D) Let h be the first integer; $2h - 6(h + 1) = 78$

   Answer: A

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6) Dan's scores on five tests are 80, 91, 93, 90, and 78. What must the score on his next test be so that the average will be 79?

A) Let p be the score on the next test; $\frac{80 + 91 + 93 + 90 + 78 + p}{5} = 79$

B) Let p be the score on the next test; $\frac{80 + 91 + 93 + 90 + 78 - p}{5} = 79$

C) Let p be the score on the next test; $\frac{80 + 91 + 93 + 90 + 78 + p}{6} = 79$

D) Let p be the score on the next test; $\frac{80 + 91 + 93 + 90 + 78 + 79}{6} = p$

Answer: C

7) A piece of wire 19 m long is to be cut into two pieces, one of them $\frac{4}{5}$ as long as the other. How should the wire be cut?

A) Let c be the length of the longer piece of wire; $c\frac{4}{5}c = 19$

B) Let c be the length of the longer piece of wire; $c + \frac{4}{5}c = 19$

C) Let c be the length of the longer piece of wire; $c - \frac{4}{5}c = 19$

D) Let c be the length of the longer piece of wire; $(\frac{4}{5}c) = 19$

Answer: B

8) The Music Store prices its blank audiotapes by raising the wholesale price 30% and adding 25 cents. What must the tape's wholesale price be if the tape is to sell for $2.88?

A) Let w represent the tape's wholesale price; $0.25 = w + 0.30w - 2.88$

B) Let w represent the tape's wholesale price; $2.88 = w + 0.30w - 0.25$

C) Let w represent the tape's wholesale price; $2.88 = 0.30w + 0.25$

D) Let w represent the tape's wholesale price; $2.88 = w + 0.30w + 0.25$

Answer: D

9) A commercial jet has been instructed to climb from its present altitude of 10,000 feet to a cruising altitude of 30,000 feet. If the plane ascends at a rate of 3000 ft/min, how long will it take to reach cruising altitude?

A) Let t represent the number of minutes to reach cruising altitude; $30,000 = 3000t$

B) Let t represent the number of minutes to reach cruising altitude; $30,000 - 10,000 = 3000t$

C) Let t represent the number of minutes to reach cruising altitude; $3000(30,000 - 10,000) = t$

D) Let t represent the number of minutes to reach cruising altitude; $30,000 - 3000 = 10,000t$

Answer: B

10) A television set is on sale for $479. This is 30% off of the original price. What was the original price?

A) Let p be the original price; $p = 0.30(479)$

B) Let p be the original price; $479 = 0.30p$

C) Let p be the original price; $479 = 0.70p$

D) Let p be the original price; $p = 0.70(479)$

Answer: C

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11) The population of Metro City grew 8% for each of 3 consecutive years. At the end of that time, the population was 67,038. Find Metro City's population at the start of the 3 year period.

A) Let p be the initial population; $67{,}038 = 1.08p$

B) Let p be the initial population; $p = 1.08(1.08)(1.08)67{,}038$

C) Let p be the initial population; $67{,}038 = 1.08(1.08)(1.08)p$

D) Let p be the initial population; $67{,}038 = (1.08 + 1.08 + 1.08)p$

Answer: C

12) One angle of a triangle is 3 times as great as a second angle. The third angle measures 3° more than twice the second angle. Find the measures of the angles.

A) Let s be the measure of the second angle; $3s + s + (6s + 3) = 180$

B) Let s be the measure of the second angle; $3s + s + (2s + 3) = 180$

C) Let s be the measure of the second angle; $3(2s - 3) + s + 2s = 180$

D) Let s be the measure of the second angle; $3s + s + (2s - 3) = 180$

Answer: B

13) A piece of wire 33 feet long is to be cut into three pieces, the second piece 3 times as long as the first, and the third piece 5 times as long as the first. How should the wire be cut?

A) Let m be the length of the first piece of wire; $3m + 5m = 33$

B) Let m be the length of the first piece of wire; $m(3m)(5m) = 33$

C) Let m be the length of the first piece of wire; $m(3)(5) = 33$

D) Let m be the length of the first piece of wire; $m + 3m + 5m = 33$

Answer: D

14) A piece of wire 141 in. long is to be cut into two pieces, and those pieces are each to be bent to make a square. The area of one square is to be 100 $in.^2$ greater than that of the other. How should the wire be cut?

A) Let x be the length of one piece of wire; $\left(\frac{x}{4}\right)^2 - \left(\frac{141 - x}{4}\right)^2 = 100$

B) Let x be the length of one piece of wire; $\left(\frac{x}{4}\right)^2 + \left(\frac{141 - x}{4}\right)^2 = 100$

C) Let x be the length of one piece of wire; $x(141 - x) = 100$

D) Let x be the length of one piece of wire; $(x)^2 - (141 - x)^2 = 100$

Answer: A

Solve the problem.

15) An employee earned $23,295 this year. This was a raise of 11% over last year. What was his salary last year? Round to the nearest dollar, if necessary.

A) $23,284

B) $20,733

C) $23,039

D) $20,986

Answer: D

16) A biologist collected 133 fern and moss samples. There were 17 fewer ferns than moss samples. How many fern samples did the biologist collect?

A) 116 fern samples

B) 46 fern samples

C) 58 fern samples

D) 75 fern samples

Answer: C

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17) A high school graduating class is made up of 418 students. There are 132 more girls than boys. How many boys are in the class?
A) 143 boys
B) 418 boys
C) 132 boys
D) 275 boys

Answer: A

18) A baseball team played 164 complete games last season. They had 26 fewer wins than losses. How many games did the team win?
A) 26 games
B) 95 games
C) 164 games
D) 69 games

Answer: D

19) The price that Tia paid for her textbook, $98, is less than what Kalli paid by $20. How much did Kalli pay for her textbook?
A) $78
B) $1960
C) $4.90
D) $118

Answer: D

20) Nathan sold 7 fewer raffle tickets than Kolby. Together they sold 39 tickets. How many tickets did Nathan sell?
A) 23
B) 19.5
C) 32
D) 16

Answer: D

21) The difference between two positive integers is 46. One integer is three times as great as the other. Find the integers.
A) 46 and 69
B) 23 and 46
C) 69 and 115
D) 23 and 69

Answer: D

22) If the first and third of three consecutive odd integers are added, the result is 87 less than five times the second integer. Find the third integer.
A) 31
B) 27
C) 58
D) 29

Answer: A

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23) In a local election, 30,200 people voted. This was an increase of 8% over the last election. How many people voted in the last election?
A) 32,616 people
B) 32,826 people
C) 27,784 people
D) 27,963 people

Answer: D

24) An airplane traveling 425 km/h in still air encounters a head wind of 25 km/h. How long will it take the plane to travel 1600 km into the wind?
A) 2 hr
B) 8 hr
C) 4 hr
D) 3.56 hr

Answer: C

25) A rectangle's length is twice its width and its perimeter is 192 m. Find the dimensions.
A) 64 m by 32 m
B) 192 m by 96 m
C) 32 m by 16 m
D) 96 m by 32 m

Answer: A

26) One angle of a triangle is 5 times as great as a second angle. The third angle measures 28° less than twice the second angle. Find the measures of the angles.
A) 140°, 28°, 28°
B) 130°, 26°, 24°
C) 115°, 23°, 42°
D) 120°, 24°, 36°

Answer: B

27) Find the length of a rectangular lot with a perimeter of 140 meters if the length is 8 meters more than the width. (P = 2L + 2W)
A) 39 m
B) 31 m
C) 70 m
D) 78 m

Answer: A

28) A rectangular Persian carpet has a perimeter of 220 inches. The length of the carpet is 30 inches more than the width. What are the dimensions of the carpet?
A) 70 inches, 100 inches
B) 80 inches, 110 inches
C) 40 inches, 70 inches
D) 95 inches, 125 inches

Answer: C

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29) If Gloria received a 7 percent raise and is now making $25,680 a year, what was her salary before the raise?

A) $24,000
B) $24,680
C) $25,000
D) $23,680

Answer: A

30) Stevie bought a stereo for $225 and put it on sale at his store at a 55% markup rate. What was the retail price of the stereo?

A) $450.00
B) $248.75
C) $348.75
D) $325.00

Answer: C

Solve.

31) $A = bh$, for b

A) $b = \frac{A}{h}$

B) $b = Ab$
C) $b = A - b$
D) $b = \frac{h}{A}$

Answer: A

32) $I = Prt$, for r

A) $r = \frac{P - 1}{It}$

B) $r = \frac{I}{Pt}$

C) $r = \frac{P - I}{1 + t}$

D) $r = P - tI$

Answer: B

33) $w = \frac{y - x}{z}$, for x

A) $x = y - wz$
B) $x = w + z - y$
C) $x = y + wz$
D) $x = w - zy$

Answer: A

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34) $w = \frac{5y - x}{y}$, for y

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

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

C) $y = \frac{5 - x}{w}$

D) $y = \frac{x}{w - 5}$

Answer: A

35) $c = \frac{5t + 6}{t}$, for t

A) $t = \frac{-6}{c - 5}$

B) $t = \frac{c + 5}{6}$

C) $t = \frac{5 + 6}{c}$

D) $t = \frac{6}{c - 5}$

Answer: D

36) $I = \frac{nE}{nr + R}$, for n

A) $n = \frac{IR}{Ir + E}$

B) $n = \frac{R}{E - Ir}$

C) $n = IR(Ir - E)$

D) $n = \frac{IR}{E - Ir}$

Answer: D

37) $\frac{PV}{T} = \frac{pv}{t}$, for P

A) $P = \frac{pv}{tTV}$

B) $P = \frac{tvT}{pV}$

C) $P = \frac{pvV}{tT}$

D) $P = \frac{pvT}{tV}$

Answer: D

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38) $V = 2s^3$, for s^3

A) $s^3 = \frac{2}{V}$

B) $s^3 = \frac{V}{2}$

C) $s^3 = V - 2$

D) $s^3 = 2V$

Answer: B

39) $N = \frac{e + j + y}{9}$, for j

A) $j = 9N - e - y$

B) $j = 9N + 9e + ey$

C) $j = 9N + e + y$

D) $j = 9(N - e - y)$

Answer: A

40) $A = \frac{1}{2}bh$, for h

A) $h = \frac{Ab}{2}$

B) $h = \frac{b}{2A}$

C) $h = \frac{A}{2b}$

D) $h = \frac{2A}{b}$

Answer: D

41) $S = 2\pi rh + 2\pi r^2$, for h

A) $h = \frac{S}{2\pi r} - 1$

B) $h = 2\pi(S - r)$

C) $h = \frac{S - 2\pi r^2}{2\pi r}$

D) $h = S - r$

Answer: C

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42) $V = \frac{1}{3}Bh$, for h

A) $h = \frac{3V}{B}$

B) $h = \frac{V}{3B}$

C) $h = \frac{3B}{V}$

D) $h = \frac{B}{3V}$

Answer: A

43) $nr + R = \frac{nE}{I}$, for n

A) $n = IR(Ir - E)$

B) $n = \frac{-IR}{Ir - E}$

C) $n = \frac{-R}{Ir - E}$

D) $n = \frac{IR}{Ir + E}$

Answer: B

44) $P = s_1 + s_2 + s_3$, for s_2

A) $s_2 = P - s_1 - s_3$

B) $s_2 = s_1 + P - s_3$

C) $s_2 = P + s_1 + s_3$

D) $s_2 = s_1 + s_3 - P$

Answer: A

45) $F = \frac{9}{5}C + 32$, for C

A) $C = \frac{F - 32}{9}$

B) $C = \frac{5}{F - 32}$

C) $C = \frac{5}{9}(F - 32)$

D) $C = \frac{9}{5}(F - 32)$

Answer: C

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46) $A = \frac{1}{2}h(b_1 + b_2)$, for b_1

A) $b_1 = \frac{h(b_2) - 2A}{h}$

B) $b_1 = \frac{2A - (h)(b_2)}{h}$

C) $b_1 = \frac{A - h(b_2)}{2h}$

D) $b_1 = \frac{(b_2)2A - h}{h}$

Answer: B

47) $a + b = s + r$, for s

A) $s = a + b - r$

B) $s = r(a + b)$

C) $s = \frac{a}{r} + b$

D) $s = \frac{a + b}{r}$

Answer: A

48) $A = P(1 + nr)$, for r

A) $r = \frac{Pn}{A - P}$

B) $r = \frac{A}{n}$

C) $r = \frac{A - P}{Pn}$

D) $r = \frac{P - A}{Pn}$

Answer: C

Solve the problem.

49) John wants to invest money to earn $150 in 4 months. He found an investment at 7%. How much must he invest?

A) $6428.57

B) $1.17

C) $14.00

D) $535.71

Answer: A

50) The area of a parallelogram is 253 cm^2. The height is 23 cm. What is the length of the base?

A) 5.5 cm

B) 11 cm

C) 22 cm

D) 242 cm

Answer: B

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51) The area of a trapezoid is 87 cm^2. The height is 6 cm and one base is 14 cm. What is the length of the other base?
A) 7.5 cm
B) 14 cm
C) 15 cm
D) 30 cm

Answer: C

52) The base of a rectangle is 8 cm and the perimeter is 34 cm. What is its area?
A) 144 cm
B) 36 cm
C) 72 cm^2
D) 80 cm^2

Answer: C

53) Sue is going to invest $43.73 at simple interest at the rate of 8%. How long will it take for the investment to double?
A) 150 years
B) 12.5 years
C) Impossible. Not enough information
D) 6.25 years

Answer: B

54) Sue is going to invest some money at simple interest at the rate of 10%. How long will it take for the investment to double?
A) 5 years
B) Impossible. Not enough information
C) 120 years
D) 10 years

Answer: D

55) The density of a substance is 3.23 grams per cubic centimeter. An empty cylindrical container has a mass of 44 grams, is 19.2 cm tall, and has a radius of 5 cm. What is the mass of the filled container? Round your answer to the nearest tenth of a gram.
A) 1508.0 grams
B) 1552.0 grams
C) 974.1 grams
D) 4914.7 grams

Answer: D

56) The density of a substance is 3.24 grams per cubic centimeter. An empty box has a mass of 56 grams, is 15.8 cm tall, 17.3 cm wide, and 10.7 cm long. What is the mass of the filled container? Round your answer to the nearest tenth gram.
A) 2928.0 grams
B) 2924.7 grams
C) 9476.2 grams
D) 9532.2 grams

Answer: D

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57) An auto mechanic finds that the interval time I, in minutes, between scheduled appointments must be related to the total number of minutes T that he is open each day and the number of scheduled oil changes N according to the formula $I = 1.09(T/N)$. If he wants to be open 8 hours each day, and feels that he can do each oil change in 10 minutes, how many appointments should he make in one day?

A) 52
B) 1
C) 0
D) 81

Answer: A

58) A garden is being constructed in the shape of a trapezoid. Given that the height of the trapezoid is 10 m, the length of one of the bases is 11 m, and the area of the garden is 175 m^2, what is the length of the unknown base?

A) 24 m
B) 19 m
C) 48 m
D) 23 m

Answer: A

State whether the equation is an example of the product rule, the quotient rule, the power rule, raising a product to a power, or raising a quotient to a power.

59) $(y^2)^4 = y^8$

A) Raising a product to a power rule
B) The power rule
C) The product rule
D) The quotient rule

Answer: B

60) $(8^5)^3 = 8^{15}$

A) The power rule
B) Raising a quotient to a power rule
C) The quotient rule
D) The product rule

Answer: A

61) $r^4 \cdot r^8 = r^{12}$

A) The quotient rule
B) The power rule
C) Raising a product to a power
D) The product rule

Answer: D

62) $\frac{m^8}{m^7} = m^1$

A) Raising a quotient to a power rule
B) The quotient rule
C) The product rule
D) The power rule

Answer: B

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63) $\left(\frac{4}{7}\right)^5 = \frac{4^5}{7^5}$

A) The product rule
B) The quotient rule
C) Raising a quotient to a power rule
D) The power rule

Answer: C

64) $(3m)^8 = 3^8 m^8$

A) The quotient rule
B) The product rule
C) The power rule
D) Raising a product to a power rule

Answer: D

Multiply and simplify. Leave your answer in exponential notation.

65) $4^3 \cdot 4^7$

A) 8^{10}
B) 4^{21}
C) 16^{21}
D) 4^{10}

Answer: D

66) $x^5 \cdot x^0$

A) x^5
B) 0
C) x^0
D) $2x^5$

Answer: A

67) $8a^8 \cdot 5a^3$

A) 13^{11}
B) $40a^{24}$
C) 13^{24}
D) $40a^{11}$

Answer: D

68) $(5n^8) \cdot (-3n^6)$

A) $2n^{48}$
B) $2n^{14}$
C) $-15n^{14}$
D) $-15n^{48}$

Answer: C

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69) $(x^5y^8)(x^4y^2z^0)$

A) x^9y^{10}

B) $x^{20}y^4$

C) $x^9y^{10}z^0$

D) $x^{20}y^4z^0$

Answer: A

70) $(-4m^4z^4)(3m^4z^2)$

A) $-12mz^8$

B) $-12m^8z^6$

C) $-12m^6z^8$

D) $-12mz^6$

Answer: B

Divide and simplify.

71) $\frac{a^7}{a^4}$

A) a^3

B) 1.8

C) $a^{1.8}$

D) a^{11}

Answer: A

72) $\frac{40x^{10}}{4x^4}$

A) $36x^6$

B) $10x^6$

C) $10x^{14}$

D) $10x^{2.5}$

Answer: B

73) $\frac{m^6n^7}{m^3n^4}$

A) m^9n^{11}

B) m^2n^2

C) m^3n^3

D) $(mn)^6$

Answer: C

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74) $\frac{50x^6y^3}{10x^2y}$

A) $5x^3y^3$
B) $5x^4y^3$
C) $5x^4y^2$
D) $40x^4y^3$

Answer: C

75) $\frac{-16x^7y^8}{8x^2y^3}$

A) $-24x^5y^5$
B) $-2x^{3.5}y^{2.7}$
C) $2x^5y^5$
D) $-2x^5y^5$

Answer: D

76) $\frac{12x^5y^8}{-6x^2y^3}$

A) $-2x^{2.5}y^{2.66666667}$
B) $-2x^3y^5$
C) $2x^3y^5$
D) $18x^3y^5$

Answer: B

77) $\frac{-8x^6y^5}{-4x^4y^3}$

A) $-12x^2y^3$
B) $2x^{1.5}y^{1.7}$
C) $-2x^2y^2$
D) $2x^2y^2$

Answer: D

78) $\frac{54x^{10}y^{10}z^{12}}{6x^3y\,z^3}$

A) $9x^7y^{10}z^4$
B) $48x^3y^{10}z^4$
C) $48x^7y^{10}z^9$
D) $9x^7y^9z^9$

Answer: D

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Evaluate.

79) Evaluate $-x^0$ for $x = 4$.

A) 0
B) - 1
C) 1
D) - 4

Answer: B

80) Evaluate $-x^0$ for $x = -5$.

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

Answer: D

81) Evaluate $(-x)^0$ for $x = -7$.

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

Answer: D

82) Evaluate $(6x)^0$ for $x = -3$.

A) 6
B) 1
C) - 18
D) 0

Answer: B

83) Evaluate $(4x)^0$ for $x = 8$.

A) 0
B) 1
C) 32
D) 4

Answer: B

84) Evaluate $7x^0$ for $x = -3$.

A) - 21
B) 0
C) 1
D) 7

Answer: D

85) Evaluate $-8x^0$ for $x = -6$.

A) 48
B) 0
C) - 8
D) 1

Answer: C

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Write an equivalent expression without a negative exponent.

86) x^{-2}

A) $-x^2$

B) x^2

C) $\frac{1}{x^2}$

D) $\frac{2}{x}$

Answer: C

87) x^7y^{-6}

A) $\frac{1}{x^7y^6}$

B) $-6x^7y$

C) $\frac{x^7}{y^6}$

D) $\frac{1}{(xy)^{42}}$

Answer: C

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

A) x^5y^2

B) $\frac{1}{x^5y^2}$

C) $\frac{1}{(xy)^{10}}$

D) $\frac{x^5}{y^2}$

Answer: B

89) $5x^3y^{-6}$

A) $\frac{5}{x^3y^6}$

B) $\frac{5x^3}{y^6}$

C) $-5x^3y^6$

D) $\frac{5x^3}{y^{-6}}$

Answer: B

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90) $\frac{x^{-6}y^4}{z^{-7}}$

A) $x^6y^4z^7$

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

C) $\frac{y^4z^7}{x^6}$

D) $\frac{y^4}{x^6z^7}$

Answer: C

91) $\frac{1}{3^{-10}}$

A) -3^{10}

B) 3^{10}

C) $\frac{1}{3^{10}}$

D) $-\frac{1}{3^{10}}$

Answer: B

92) $2a^{-3}$

A) $\frac{1}{2a^3}$

B) $-\frac{2}{a^3}$

C) $\frac{2}{a^3}$

D) $-2a^3$

Answer: C

Write an equivalent expression with negative exponents.

93) $\frac{1}{9^4}$

A) $-\frac{1}{9^{-4}}$

B) 9^{-4}

C) -36^{-1}

D) -9^{-4}

Answer: B

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94) $\frac{1}{(-5)^3}$

A) $(-5)^{-3}$

B) $\frac{1}{5^{-3}}$

C) $\frac{1}{(-5)^{-3}}$

D) 5^{-3}

Answer: A

95) x^6

A) $\frac{1}{-x^6}$

B) $\frac{1}{x^{-6}}$

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

D) $\frac{1}{-x^{-6}}$

Answer: B

96) $9x^5$

A) $9x^{-5}$

B) $\frac{1}{(9)x^{-5}}$

C) $\frac{1}{9x^{-5}}$

D) $\frac{9}{x^{-5}}$

Answer: D

97) $\frac{1}{(8y)^3}$

A) $-24y^{-3}$

B) $8y^{-3}$

C) $(8y)^{-3}$

D) $\frac{y^{-3}}{8}$

Answer: C

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98) $\frac{1}{9y^5}$

A) $\frac{y^5}{9}$

B) $9y^{-5}$

C) $\frac{y^{-5}}{9}$

D) $-45y^{-5}$

Answer: C

Simplify using only positive exponents. Leave the answer in exponential notation.

99) $9^{-2} \cdot 9^5$

A) $\frac{1}{9^{10}}$

B) 81^3

C) 81^{10}

D) 9^3

Answer: D

100) $8^{-8} \cdot 8^{-2}$

A) $\frac{1}{16^{10}}$

B) -8^{10}

C) $\frac{1}{8^{16}}$

D) $\frac{1}{8^{10}}$

Answer: D

101) $x^{-8} \cdot x^3 \cdot x^{-4}$

A) $\frac{1}{x^{15}}$

B) $-x^9$

C) x^{96}

D) $\frac{1}{x^9}$

Answer: D

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102) $(y^3)(y^5)(y^{-3})$

A) y^{45}

B) y^5

C) $\frac{1}{y^{45}}$

D) y^7

Answer: B

103) $(7x^{-6}y^{-4})(4xy^{-3})$

A) $\frac{28}{x^5y^7}$

B) $\frac{11}{x^5y^7}$

C) $\frac{28y^{12}}{x^6}$

D) $-28x^5y^7$

Answer: A

104) $\frac{2^{-3}}{2^6}$

A) 2^9

B) $\frac{1}{2^9}$

C) $\frac{1}{2^3}$

D) 2^3

Answer: B

105) $\frac{3^{-4}}{3^{-2}}$

A) $\frac{1}{3^6}$

B) 3^6

C) 3^2

D) $\frac{1}{3^2}$

Answer: D

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106) $\frac{x^3}{x^{-8}}$

A) x^{11}

B) $\frac{1}{x^5}$

C) $\frac{1}{x^{11}}$

D) $-x^5$

Answer: A

107) $\frac{6^{-1}}{6^5}$

A) 6^4

B) 6^6

C) $\frac{1}{6^4}$

D) $\frac{1}{6^6}$

Answer: D

108) $\frac{x^{-4}y^6}{x^{-2}y^4}$

A) $\frac{y^2}{x^2}$

B) $\frac{x^2}{y^2}$

C) $\frac{x^3}{y^3}$

D) $\frac{y^3}{x^3}$

Answer: A

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109) $\frac{42a^{-2}b^5}{6a^{-9}b^7}$

A) $\frac{7a^7}{b^2}$

B) $-7ab^2$

C) $-\frac{a^6}{7b^3}$

D) $\frac{7b^3}{a^7}$

Answer: A

110) $\frac{35x^2y^{-3}z^7}{5x^4y^{-6}z^{-3}}$

A) $\frac{7y^3}{x^2z^{10}}$

B) $\frac{7y^3z^4}{x^2}$

C) $\frac{7y^3z^{10}}{x^2}$

D) $\frac{7x^2z^{10}}{y^3}$

Answer: C

Simplify. Write the answer using only positive exponents. Leave the answer in exponential notation.

111) $(a^5)^5$

A) $\frac{1}{a^{25}}$

B) a^{25}

C) a^{10}

D) $\frac{1}{a^{10}}$

Answer: B

112) $(7^5)^{-7}$

A) $\frac{1}{7^2}$

B) $\frac{1}{7^{35}}$

C) 7^2

D) -7^{35}

Answer: B

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113) $(5^{-3})^7$

A) 5^4

B) -5^{21}

C) $\frac{1}{5^{21}}$

D) $\frac{1}{5^4}$

Answer: C

114) $(xy^3)^4$

A) xy^7

B) x^4y^7

C) xy^{12}

D) x^4y^{12}

Answer: D

115) $(3x^3)^3$

A) $27x^6$

B) $27x^3$

C) $3x^9$

D) $27x^9$

Answer: D

116) $(5xy)^3$

A) $15 \cdot 3x \cdot 3y$

B) $5x^3y^3$

C) $125x^3y^3$

D) $5xy^3$

Answer: C

117) $(x^3y)^5$

A) x^8y^5

B) x^3y^5

C) $x^{15}y^5$

D) xy^{15}

Answer: C

118) $(-2x^3y)^5$

A) $-32x^{15}y^5$

B) $-32x^{15}y$

C) $-2x^{15}y^5$

D) $-32x^8y^5$

Answer: A

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119) $(-3x^{-5}y)^{-5}$

A) $-\dfrac{243x^{25}}{y^5}$

B) $-\dfrac{x^{25}}{243y^5}$

C) $-\dfrac{x^{25}y}{243}$

D) $\dfrac{x^{25}y^5}{243}$

Answer: B

120) $\left(\dfrac{-2w^5}{x}\right)^4$

A) $\dfrac{16w^{20}}{x}$

B) $\dfrac{16w^{20}}{x^4}$

C) $\dfrac{16w^9}{x^4}$

D) $-\dfrac{16w^{20}}{x^4}$

Answer: B

Simplify. Write the answer using positive exponents only. Leave the answer in exponential notation.

121) $(2x^{-4})^3(x^3)^{-5}$

A) $\dfrac{2^3}{x^{27}}$

B) $\dfrac{1}{2^{-12}x^{27}}$

C) 2^3x^{180}

D) $\dfrac{2^3}{x^3}$

Answer: A

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122) $\frac{10r^5(r^{-4})^{-5}}{3(r^{-2})^{-5}}$

A) $\frac{10r^{15}}{3}$

B) $\frac{10}{3r^3}$

C) $\frac{10}{3r^{15}}$

D) $\frac{10r^3}{3}$

Answer: A

123) $\frac{(3x^4y^2)^5}{9xy^2}$

A) $27x^{19}y^8$

B) $27x^8y^5$

C) $\frac{x^{19}y^8}{3}$

D) $\frac{x^8y^5}{3}$

Answer: A

124) $\left(\frac{2x^3y^{-3}}{x^{-5}y^3}\right)^{-4}$

A) $\frac{y^{24}}{2x^8}$

B) $\frac{2x^{32}}{y^{24}}$

C) $\frac{y^{24}}{16x^{32}}$

D) $\frac{y^{24}}{2x^{32}}$

Answer: C

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125) $\left(\frac{6a^2b^{-5}}{3a^{-4}b^6}\right)^0$

A) 1

B) $\frac{2}{a^2b}$

C) 0

D) $\frac{2a^6}{b^{11}}$

Answer: A

126) $\left(\frac{5x^3y^{-5}}{2y^{-2}}\right)^4$

A) $\frac{5^4x^{12}}{2^4y^{12}}$

B) $\frac{5^4x^{12}}{2y^{12}}$

C) $\frac{5^4x^{12}y^{12}}{2^4}$

D) $\frac{5^4x^3}{2^4y^{12}}$

Answer: A

127) $(r^3s)^2(r^2s^5)^5$

A) $r^{16}s^{3127}$

B) $r^{41}s^{3127}$

C) $r^{41}s^{27}$

D) $r^{16}s^{27}$

Answer: D

128) $(2r^4s)^2(2r^2s^{-4})^5$

A) $\frac{2^7r^{18}}{s^{18}}$

B) $\frac{2^{10}r^{18}}{s^{18}}$

C) $\frac{2^7r^{48}}{s^{1022}}$

D) $\frac{2^{10}r^{48}}{s^{1022}}$

Answer: A

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Express the number in scientific notation.

129) 0.000431

A) 4.31×10^{4}

B) 4.31×10^{-5}

C) 4.31×10^{-3}

D) 4.31×10^{-4}

Answer: D

130) 0.000019112

A) 1.9112×10^{-5}

B) 1.9112×10^{-4}

C) 1.9112×10^{4}

D) 1.9112×10^{5}

Answer: A

131) 0.0000081816

A) 8.1816×10^{-7}

B) 8.1816×10^{6}

C) 8.1816×10^{-6}

D) 8.1816×10^{-5}

Answer: C

132) 0.00000090602

A) 9.0602×10^{7}

B) 9.0602×10^{6}

C) 9.0602×10^{-7}

D) 9.0602×10^{-6}

Answer: C

133) 0.0000000926015

A) 9.26015×10^{-8}

B) 9.26015×10^{-9}

C) 9.26015×10^{-7}

D) 9.26015×10^{8}

Answer: A

134) 41,000,000,000

A) 4.1×10^{-10}

B) 4.1×10^{10}

C) 4.1×10^{9}

D) 4.1×10^{-9}

Answer: B

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135) 933,000,000,000,000,000

A) 933×10^{-15}

B) 9.33×10^{-17}

C) 9.33×10^{17}

D) 933×10^{15}

Answer: C

136) 7,100,000,000,000

A) 7.1×10^{12}

B) 7.1×10^{-9}

C) 7.1×10^{-12}

D) 7.1×10^{9}

Answer: A

137) 3,200,000,000

A) 3200×10^{6}

B) 320×10^{7}

C) 3.2×10^{6}

D) 3.2×10^{9}

Answer: D

138) 550,423,000,000

A) 550.423×10^{9}

B) 5.50423×10^{11}

C) 5.50423×10^{9}

D) 5504.23×10^{8}

Answer: B

Express the number in decimal notation.

139) 7.17×10^{5}

A) 71,700

B) 358.5

C) 7,170,000

D) 717,000

Answer: D

140) 3.407×10^{6}

A) 34,070,000

B) 340,700

C) 204.42

D) 3,407,000

Answer: D

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141) 5.7466×10^{4}

A) 5746.6
B) 574,660
C) 229.864
D) 57,466

Answer: D

142) 8.34×10^{-4}

A) 0.00834
B) 0.0000834
C) - 834,000
D) 0.000834

Answer: D

143) 4.817×10^{-5}

A) 0.0004817
B) 0.000004817
C) - 481,700
D) 0.00004817

Answer: D

144) 1.585×10^{-6}

A) 0.000001585
B) 0.0000001585
C) 0.00001585
D) - 1,585,000

Answer: A

145) 7.0848×10^{-7}

A) 0.000000070848
B) 0.0000070848
C) 0.00000070848
D) - 708,480,000

Answer: C

Simplify and write the answer using scientific notation. Use the correct number of significant digits.

146) $(4.3 \times 10^{4})(2.2 \times 10^{5})$

A) 9.46×10^{9}
B) 95×10^{10}
C) 9.5×10^{9}
D) 946×10^{7}

Answer: C

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147) $(7.8 \times 10^{-4})(8.9 \times 10^{6})$

A) 6.9×10^{3}

B) 6.9×10^{2}

C) 1.8×10^{2}

D) 17×10^{10}

Answer: A

148) $(3.3 \times 10^{-6})(2.1 \times 10^{-8})$

A) 6.9×10^{-14}

B) 6.9×10^{14}

C) 6.9×10^{-2}

D) 5.4×10^{14}

Answer: A

149) $(3.46 \times 10^{-3})(4.8 \times 10^{-4})$

A) 17×10^{-7}

B) 16.608×10^{-7}

C) 1.7×10^{-6}

D) 1.7×10^{-8}

Answer: C

150) $(8.52 \times 10^{-6}) \times (8.93 \times 10^{-3})$

A) 7.6×10^{-8}

B) 7.6×10^{18}

C) 7.61×10^{-8}

D) 7.61×10^{18}

Answer: C

151) $(1.135 \times 10^{-2})\ (1.781 \times 10^{10})$

A) 2.021×10^{-20}

B) 2.916×10^{8}

C) 2.916×10^{-20}

D) 2.021×10^{8}

Answer: D

152) $\dfrac{6 \times 10^{2}}{3 \times 10^{6}}$

A) 2×10^{8}

B) 4×10^{-4}

C) 2×10^{-4}

D) 4×10^{8}

Answer: C

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153) $\frac{13.02 \times 10^{-3}}{4.2 \times 10^{7}}$

A) 3.1×10^{4}

B) 6.2×10^{-10}

C) 6.2×10^{4}

D) 3.1×10^{-10}

Answer: D

154) $\frac{3.8 \times 10^{11}}{7.3 \times 10^{6}}$

A) 1.1×10^{6}

B) 5.2×10^{-6}

C) 5.2×10^{4}

D) 5.2×10^{16}

Answer: C

155) $\frac{1.3 \times 10^{-6}}{4.9 \times 10^{-10}}$

A) 2.7×10^{-17}

B) 6.2×10^{4}

C) 2.7×10^{-5}

D) 2.7×10^{3}

Answer: D

156) $\frac{12 \times 10^{-8}}{4.8 \times 10^{1}}$

A) 2.5×10^{-7}

B) 5.0×10^{-7}

C) 2.5×10^{-9}

D) 5.0×10^{-9}

Answer: C

157) $6.3 \times 10^{16} + 7.6 \times 10^{16}$

A) 13.9×10^{17}

B) 1.4×10^{16}

C) 1.4×10^{17}

D) 13.9×10^{16}

Answer: C

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158) $5.8 \times 10^{-12} + 9.3 \times 10^{-12}$

A) 15.1×10^{-12}

B) 15×10^{-12}

C) 1.5×10^{-11}

D) 1.51×10^{-11}

Answer: C

Solve the problem. Use the correct number of significant digits.

159) The national debt of a country is $18,160,000,000 and the population is 4,540,000. What is the amount of debt per person?

A) $400

B) $82,446,400

C) $40,000

D) $4000

Answer: D

160) Assume that the volume of the earth is 2.8×10^{14} cubic meters and the volume of a bacterium is 2.4×10^{-16} cubic meters. If the earth could be filled with bacteria, how many would it contain?

A) 1.2×10^{-31} bacteria

B) 1.2×10^{31} bacteria

C) 1.2×10^{30} bacteria

D) 1.2×10^{-30} bacteria

Answer: C

161) If the speed of light is 3.00×10^{8} m/sec, how long does it take light to travel 2.29×10^{11} m, the distance from the sun to Mars?

A) 7.63×10^{2} sec

B) 7.6×10^{3} sec

C) 76 sec

D) 7.6×10^{2} min

Answer: A

162) A computer can do one calculation in 1.8×10^{-7} seconds. How long would it take the computer to do a trillion (10^{12}) calculations?

A) 1.8×10^{6} sec

B) 1.8×10^{12} sec

C) 1.8×10^{-7} sec

D) 1.8×10^{5} sec

Answer: D

163) Assume that the volume of Earth is 5.0×10^{14} cubic meters and the volume of a bacterium is 2.5×10^{-16} cubic meters. If Earth could be filled with bacteria, how many would it contain?

A) 2.0×10^{-30} bacteria

B) 5.0×10^{-31} bacteria

C) 5.0×10^{31} bacteria

D) 2.0×10^{30} bacteria

Answer: D

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164) A computer can do one calculation in 1.4×10^{-7} seconds. How long would it take the computer to do a trillion (10^{12}) calculations?

A) 1.4×10^{5} sec

B) 1.4×10^{6} sec

C) 1.4×10^{-7} sec

D) 1.4×10^{12} sec

Answer: A

165) The sun is surrounded by an extremely hot plasma called the "corona". The average kinetic energy E of a subatomic particle in the corona can be approximated by the model $E = \frac{3}{2}kT$, where E is in joules, T is the Kelvin temperature of the corona, and k is Boltzmann's constant, $k = 1.38 \times 10^{-23}$ J/K. Find the average kinetic energy for a proton in a coronal region with $T = 7.4 \times 10^{6}$ K.

A) 3.1×10^{-16} J

B) 2.0×10^{-16} J

C) 1.5×10^{-16} J

D) 1.5×10^{-22} J

Answer: C

166) The sun is surrounded by an extremely hot plasma called the "corona". The average kinetic energy E of a subatomic particle in the corona can be approximated by the model $E = \frac{3}{2}kT$, where E is in joules, T is the Kelvin temperature of the corona, and k is Boltzmann's constant, $k = 1.38 \times 10^{-23}$ J/K. At a certain distance above the sun's north pole, a measurement indicates that the average kinetic energy of coronal particles is 0.00 J. Estimate the temperature in this region.

A) 2.13×10^{6} K

B) 3.13×10^{-7} K

C) 3.20×10^{6} K

D) 3.20×10^{5} K

Answer: C

167) The kinetic energy E of an electron in a television picture tube is given by $E = \frac{1}{2}mv^2$, where E is in joules, m is the mass of the electron in kilograms, and v is its speed in meters per second. Find the kinetic energy of an electron if its speed is 2.0×10^{6} m/s. (The mass of an electron is $m = 9.109 \times 10^{-31}$ kg.)

A) 3.6×10^{-18} J

B) 1.8×10^{-20} J

C) 1.8×10^{-18} J

D) 9.1×10^{-25} J

Answer: C

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168) The wavelength λ (in meters) of light of frequency υ (in Hertz) is given by $\lambda = \frac{c}{\upsilon}$, where c is the speed of light ($c = 2.99 \times 10^8$ m/s). Find the wavelength of light with a frequency of 6.2×10^{13} Hz.

A) 4.8×10^4 m

B) 4.8×10^{-6} m

C) 4.8×10^{-14} m

D) 3.0×10^{-5} m

Answer: B

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

Provide an appropriate response.

169) Explain the difference between rational numbers and irrational numbers.

Answer: A rational number can be expressed as a quotient of an integer and a nonzero integer or as a terminating or repeating decimal. A real number that is not rational is irrational.

170) Determine whether the following statement is true or false, and explain why. All integers are rational numbers.

Answer: True; any integer n can be named as $\frac{n}{1}$, a rational number.

171) Determine whether the following statement is true or false, and explain why. All real numbers are rational numbers.

Answer: False; the real numbers consist of the rational numbers and also the irrational numbers.

172) Why is absolute value always non- negative?

Answer: The absolute value of a number is the number's distance from zero on a number line. Since distance is always non- negative, absolute value is always non- negative.

173) Explain how addition and subtraction of real numbers are related.

Answer: To subtract we add the the opposite of the number being subtracted.

174) Most calculators have a key, often appearing as [+,-], for finding opposites. To use this key, enter a number and then press [+,-] to find its opposite. What will happen when you enter a number and press the [+,-] twice? Why?

Answer: You will get the original number. The opposite of the opposite of a number is the number itself.

175) Explain why the product of an even number of negative numbers is positive.

Answer: The numbers can be grouped in pairs. The product of each pair is positive, so the product of all the numbers is positive.

176) Are putting on a shirt, tie, and jacket associative activities? Explain.

Answer: No. The sequence does matter.

177) Is it always true that $c + (a \times b) = (c + a) \times (c + b)$, where a, b, and c are real numbers? If not, provide an example that shows the statement is false.

Answer: It is not true. $3 + (4 \times 5) \neq (3 + 4)(3 + 5)$

178) Give an example which demonstrates that subtraction is not commutative.

Answer: Answers may vary. $8 - 5 = 3$, but $5 - 8 = -3$.

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179) Give an example which demonstrates that division is not commutative.

Answer: Answers may vary. $32 \div 4 = 8$, but $4 \div 32 = \frac{1}{8}$.

180) Explain why $(-1)^n = 1$ for any even number n.

Answer: For any number n,

$(-1)^n = [(-1)(-1)][(-1)(-1)] \ldots [(-1)(-1)]$

($\frac{n}{2}$ pairs of factors)

$= 1 \cdot 1 \cdot 1 \ldots \cdot 1$ ($\frac{n}{2}$ factors of 1)

181) Explain why $(-6)^{-10}$ is positive.

Answer: $(-6)^{-10} = \frac{1}{(-6)^{10}}$ and $(-6)^{10}$ is positive, then $(-6)^{-10}$ is positive.

182) Under what conditions does x^m represent a negative number? Why?

Answer: Any number raised to an even power is non-negative. Any non-negative number raised to an odd power is non-negative. Any negative number raised to an odd power is negative. Thus, x must be a negative number, and m must be an odd number.

183) Use the quotient rule to explain why $9^0 = 1$.

Answer: $9^0 = 9^{1-1} = \frac{9}{9} = 1$; answers may vary.

184) Explain why 32.46×10^5 is not in scientific notation.

Answer: 32.46 is not a number greater than or equal to 1 and less than 10.

185) Scientific notation is useful with very small numbers. Explain another way that scientific notation is useful.

Answer: Scientific notation is useful with very large numbers.

186) In scientific notation, what is the smallest positive integer which can be multiplied by a power of 10?

Answer: 1

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1) A
2) C
3) A
4) B
5) A
6) C
7) B
8) D
9) B
10) C
11) C
12) B
13) D
14) A
15) D
16) C
17) A
18) D
19) D
20) D
21) D
22) A
23) D
24) C
25) A
26) B
27) A
28) C
29) A
30) C
31) A
32) B
33) A
34) A
35) D
36) D
37) D
38) B
39) A
40) D
41) C
42) A
43) B
44) A
45) C
46) B
47) A
48) C
49) A
50) B

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51) C
52) C
53) B
54) D
55) D
56) D
57) A
58) A
59) B
60) A
61) D
62) B
63) C
64) D
65) D
66) A
67) D
68) C
69) A
70) B
71) A
72) B
73) C
74) C
75) D
76) B
77) D
78) D
79) B
80) D
81) D
82) B
83) B
84) D
85) C
86) C
87) C
88) B
89) B
90) C
91) B
92) C
93) B
94) A
95) B
96) D
97) C
98) C
99) D
100) D

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

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151) D
152) C
153) D
154) C
155) D
156) C
157) C
158) C
159) D
160) C
161) A
162) D
163) D
164) A
165) C
166) C
167) C
168) B
169) A rational number can be expressed as a quotient of an integer and a nonzero integer or as a terminating or repeating decimal. A real number that is not rational is irrational.
170) True; any integer n can be named as $\frac{n}{1}$, a rational number.
171) False; the real numbers consist of the rational numbers and also the irrational numbers.
172) The absolute value of a number is the number's distance from zero on a number line. Since distance is always non- negative, absolute value is always non- negative.
173) To subtract we add the the opposite of the number being subtracted.
174) You will get the original number. The opposite of the opposite of a number is the number itself.
175) The numbers can be grouped in pairs. The product of each pair is positive, so the product of all the numbers is positive.
176) No. The sequence does matter.
177) It is not true. $3 + (4 \times 5) \neq (3 + 4)(3 + 5)$
178) Answers may vary. $8 - 5 = 3$, but $5 - 8 = -3$.
179) Answers may vary. $32 \div 4 = 8$, but $4 \div 32 = \frac{1}{8}$.
180) For any number n,

$(-1)^n = [(-1)(-1)][(-1)(-1)] \ldots [(-1)(-1)]$

($\frac{n}{2}$ pairs of factors)

$= 1 \cdot 1 \cdot 1 \ldots \cdot 1$ ($\frac{n}{2}$ factors of 1)

181) $(-6)^{-10} = \frac{1}{(-6)^{10}}$ and $(-6)^{10}$ is positive, then $(-6)^{-10}$ is positive.
182) Any number raised to an even power is non- negative. Any non- negative number raised to an odd power is non- negative. Any negative number raised to an odd power is negative. Thus, x must be a negative number, and m must be an odd number.
183) $9^0 = 9^{1-1} = \frac{9}{9} = 1$; answers may vary.
184) 32.46 is not a number greater than or equal to 1 and less than 10.

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185) Scientific notation is useful with very large numbers.
186) 1

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