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

**Evaluate the expression for the given value or values.**

1) $42 + y$   for $y = 43$
   A) 76                     B) 58                     C) 85                     D) 67
   Answer: C

2) $x - x$   for $x = 45$
   A) 1                      B) 45                     C) 0                      D) –1
   Answer: C

3) $x \div 6$   for $x = 342$
   A) 60                     B) 55                     C) 57                     D) 59
   Answer: C

4) $y \div y$   for $y = 6$
   A) 0                      B) –1                     C) 1                      D) 6
   Answer: C

5) $0 \div x$   for $x = 354$
   A) –1                     B) 0                      C) 1                      D) 354
   Answer: B

6) $6x$, for $x = 9$
   A) $\dfrac{6}{9}$          B) $\dfrac{9}{6}$          C) 15                     D) 54
   Answer: D

7) $x(9)$, for $x = 3$
   A) $\dfrac{3}{9}$          B) $\dfrac{9}{3}$          C) 12                     D) 27
   Answer: D

8) $x + y$   for $x = 15, y = 12$
   A) 72                     B) 27                     C) 36                     D) 63
   Answer: B

9) $x \div y$   for $x = 440, y = 8$
   A) 58                     B) 53                     C) 55                     D) 57
   Answer: C

10) $xy$, for $x = 5, y = 6$
    A) $\dfrac{5}{6}$         B) 30                     C) 11                     D) $\dfrac{6}{5}$
    Answer: B

11) $x \cdot y$   for $x = 4, y = 85$
    A) 320                    B) 440                    C) 340                    D) 329
    Answer: C

**Solve the problem.**

1

12) Each ounce of gold is worth $45.

(i) Complete the table to find an expression that describes the total value (in dollars) of n ounces of gold. Show the arithmetic to help you see a pattern.

(ii) Evaluate the expression you found in part (i) for n =8. What does your result mean in this situation?

Number of Ounces and Total Value

| Number of Ounces | Total Value (dollars) |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| n | |

A) (i)

Number of Ounces and Total Value

| Number of Ounces | Total Value (dollars) |
|---|---|
| 1 | 45 – 1 |
| 2 | 45 – 2 |
| 3 | 45 – 3 |
| 4 | 45 – 4 |
| n | 45 – n |

(ii) 37; $37 is the total value of 8 ounces of gold priced at $45 per ounce.

B) (i)

Number of Ounces and Total Value

| Number of Ounces | Total Value (dollars) |
|---|---|
| 1 | 45 + 1 |
| 2 | 45 + 2 |
| 3 | 45 + 3 |
| 4 | 45 + 4 |
| n | 45 + n |

(ii) 53; $53 is the total value of 8 ounces of gold priced at $45 per ounce.

C) (i)

Number of Ounces and Total Value

| Number of Ounces | Total Value (dollars) |
|---|---|
| 1 | 45 ÷ 1 |
| 2 | 45 ÷ 2 |
| 3 | 45 ÷ 3 |
| 4 | 45 ÷ 4 |
| n | 45 ÷ n |

(ii) 5.63; $5.63 is the total value of 8 ounces of gold priced at $45 per ounce.

D) (i)

| Number of Ounces and Total Value | |
| --- | --- |
| Number of Ounces | Total Value (dollars) |
| 1 | 45 · 1 |
| 2 | 45 · 2 |
| 3 | 45 · 3 |
| 4 | 45 · 4 |
| n | 45n |

(ii) 360; $360 is the total value of 8 ounces of gold priced at $45 per ounce.

Answer: D

13) Each customer of a photography studio pays a sitting fee of $20.
(i) Complete the table to find an expression that describes the total cost (in dollars) of a photograph package plus the sitting fee if a customer pays p dollars for a photograph package. Show the arithmetic to help you see a pattern.
(ii) Evaluate the expression you found in part (i) for p = 171. What does your result mean in this situation?

| Cost of Photograph Package and Total Cost | |
| --- | --- |
| Cost of Photograph Package | Total Cost (dollars) |
| 128 | |
| 129 | |
| 130 | |
| 131 | |
| p | |

A) (i)

| Cost of Photograph Package and Total Cost | |
| --- | --- |
| Cost of Photograph Package | Total Cost (dollars) |
| 128 | 128 + 20 |
| 129 | 129 + 20 |
| 130 | 130 + 20 |
| 131 | 131 + 20 |
| p | p + 20 |

(ii) 191; If the photograph package is $171, then the total cost is $191.

B) (i)

| Cost of Photograph Package and Total Cost | |
| --- | --- |
| Cost of Photograph Package | Total Cost (dollars) |
| 128 | 128 + 20 |
| 129 | 129 + 20 |
| 130 | 130 + 20 |
| 131 | 131 + 20 |
| p | p + 20 |

(ii) 151; If the photograph package is $171, then the total cost is $151.

C) (i)

| Cost of Photograph Package and Total Cost | |
|---|---|
| Cost of Photograph Package | Total Cost (dollars) |
| 128 | 128 + 20 |
| 129 | 129 + 20 |
| 130 | 130 + 20 |
| 131 | 131 + 20 |
| p | p + 20 |

(ii) 3420;  If the photograph package is $171, then the total cost is $3420.

D) (i)

| Cost of Photograph Package and Total Cost | |
|---|---|
| Cost of Photograph Package | Total Cost (dollars) |
| 128 | 128 + 20 |
| 129 | 129 + 20 |
| 130 | 130 + 20 |
| 131 | 131 + 20 |
| p | p + 20 |

(ii) 8.55;  If the photograph package is $171, then the total cost is $8.55.

Answer: A

**Let x be a number. Translate the English phrase or sentence into a mathematical expression.**

14) The total of 145 and a number

    A) $145 - x$          B) $145$          C) $145x$          D) $145 + x$

Answer: D

15) The sum of a number and 52

    A) $52$          B) $x - 52$          C) $52x$          D) $x + 52$

Answer: D

16) 5 times a number

    A) $5 + x$          B) $5x$          C) $5 \div x$          D) $5 - x$

Answer: B

17) 9 less than a number

    A) $9 - x$          B) $x - 9$          C) $x + 9$          D) $9 \div x$

Answer: B

18) The product of 4 and a number

    A) $4x$          B) $4 - x$          C) $4 \div x$          D) $4 + x$

Answer: A

19) Subtract 72 from a number

    A) $72$          B) $72 - x$          C) $72x$          D) $x - 72$

Answer: D

20) The difference of a number and 68
    A) 68                    B) 68x                    C) x – 68                    D) 68 – x

    Answer: C

21) 49 decreased by a number
    A) x – 49                B) 49 – x                 C) 49 + x                   D) 49 ÷ x

    Answer: B

22) Divide a number by 27
    A) 27x                   B) 27 ÷ x                 C) x – 27                   D) x ÷ 27

    Answer: D

23) The quotient of 53 and a number
    A) 53 ÷ x                B) 53 – x                 C) x ÷ 53                   D) x – 53

    Answer: A

24) A number increased by 65
    A) 65x                   B) 65 ÷ x                 C) x + 65                   D) x – 65

    Answer: C

25) Two more than a number
    A) 2x                    B) x ÷ 2                  C) x + 2                    D) x – 2

    Answer: C

26) Four less than a number
    A) 4x                    B) x – 4                  C) x ÷ 4                    D) 4 – x

    Answer: B

27) Divide a number by seven
    A) 7x                    B) 7 – x                  C) 7 ÷ x                    D) x ÷ 7

    Answer: D

28) A number decreased by six
    A) $\dfrac{6}{x}$        B) x – 6                  C) 6 – x                    D) x + 6

    Answer: B

**Let x be a number. Translate the expression into an English phrase.**

29) 135 + x
    A) The total of 135 and a number              B) The difference of 135 and a number
    C) Divide 135 by a number.                    D) Multiply 135 by a number.

    Answer: A

30) x + 83
    A) The quotient of a number and 83            B) The difference between a number and 83
    C) The product of a number and 83             D) The sum of a number and 83

    Answer: D

31) 6x
    A) 6 times a number                      B) 6 divided by a number
    C) 6 minus a number                      D) 6 plus a number

  Answer: A

32) x – 72
    A) 72 less a number                       B) 72 plus a number
    C) 72 increased by a number             D) 72 less than a number

  Answer: D

33) 9x
    A) The product of 9 and a number          B) Divide a number by 9.
    C) The quotient of 9 and a number        D) The sum of 9 and a number

  Answer: A

34) x – 72
    A) 72 multiplied by a number            B) Subtract 72 from a number
    C) Subtract a number from 72           D) The ratio of 72 and a number

  Answer: B

35) x – 69
    A) The quotient of a number and 69       B) The difference of  69 and a number
    C) The difference of a number and 69      D) The sum of a number and 69

  Answer: C

36) 71 – x
    A)  71 less than a number                B) A number decreased by 71
    C)  A number less 71                  D)  71 decreased by  a number

  Answer: D

37) x ÷ 52
    A) The quotient of 52 and a number       B) Divide 52 by a number.
    C) Divide a number by 52               D) The ratio of 52 to a number

  Answer: C

38)  49 ÷ x
    A) Divide a number by 49.              B) The ratio of a number to 49
    C) The quotient of a number and 49       D) The quotient of 49 and a number

  Answer: D

39) x + 44
    A) A number increased by 44           B) A number multiplied by 44
    C) A number decreased by 44          D) A number divided by 44

  Answer: A

40) x + 10
    A) Ten times a number                B) Ten more than a number
    C) Ten divided by a number           D) Ten less than a number

  Answer: B

41) x – 4
    A) Four minus a number                             B) Four decreased by a number
    C) Four less than a number                          D) Four more than a number

    Answer:  C

42) 5 ÷ x
    A) Five added to a number                           B) Five divided by a number
    C) Five decreased by a number                     D) Five multiplied by a number

    Answer:  B

43) x – 1
    A) A number decreased by one                     B) A number plus one
    C) one minus a number                            D) A number increased by one

    Answer:  A

**Solve the problem.**

44) Translate the phrase into a mathematical expression then evaluate the expression for x = 53 and y = 42.

    The sum of x and y
    A) x + y; 77                 B) x + y; 95                 C) x + y; 86                 D) x + y; 59

    Answer:  B

45) Translate the phrase into a mathematical expression then evaluate the expression for x = 200 and y = 4.

    The quotient of x and y
    A) x ÷ y; 53                 B) x ÷ y; 48                 C) x ÷ y; 52                 D) x ÷ y; 50

    Answer:  D

46) Translate the phrase into a mathematical expression then evaluate the expression for x = 8 and y = 7.

    The product of x and y
    A) xy; 56                 B) $x \div y; \dfrac{8}{7}$            C) x + y; 15             D) $y \div x; \dfrac{7}{8}$

    Answer:  A

47) For the period 2000 – 2006, if M is the average math SAT score (in points) for a certain year, then the average verbal SAT score (in points) for that year is approximately M + t where t is the number of years since 2000. The average math SAT score was 480 points in 2003. Estimate the average verbal SAT score in 2003.
    A) 488 points                 B) 483 points                 C) 493 points                 D) 478 points

    Answer:  B

48) A person drives 38t miles in t hours.
   (i) Evaluate 38t for t = 1, t = 2, t = 3, and t = 4. Describe the meaning of your results.
   (ii) Refer to your results to part (i) to determine at what speed the person is traveling.
   A) (i) 39, 40, 41, 42; The person drives 39 miles in 1 hour, 40 miles in 2 hours, 41 miles in 3 hours, 42 miles in 4 hours.
      (ii) The person is driving 39 miles per hour.
   B) (i) 38, 19.0, 12.7, 9.5; The person drives 38 miles in 1 hour, 19.0 miles in 2 hours, 12.7 miles in 3 hours, 9.5 miles in 4 hours.
      (ii) The person is driving 38 miles per hour.
   C) (i) 76, 114, 152, 190; The person drives 76 miles in 1 hour, 114 miles in 2 hours, 152 miles in 3 hours, 190 miles in 4 hours.
      (ii) The person is driving 38 miles per hour.
   D) (i) 38, 76, 114, 152; The person drives 38 miles in 1 hour, 76 miles in 2 hours, 114 miles in 3 hours, 152 miles in 4 hours.
      (ii) The person is driving 38 miles per hour.

   Answer: D

49) Kevin and Amir share in the profits of a pet supplies store. If the total profit is $40,000 and p is the amount of profit Kevin receives, write an expression for the amount Amir receives.
   A) p + $40,000          B) $40,000 – p          C) p – $40,000          D) $40,000 + p

   Answer: B

50) Keerti found that he had y nickels in his pocket. Write an expression that represents this quantity of money in cents.

   A) $\frac{y}{5}$          B) 5y          C) y + 5          D) $\frac{5}{y}$

   Answer: B

51) A motorcycle shop maintains an inventory of three times as many new bikes as used bikes so that if n is the number of new bikes, there are n ÷ 3 used bikes at the shop. If there are 120 new bikes, how many used bikes are now in stock?
   A) 80 used bikes          B) 360 used bikes          C) 60 used bikes          D) 40 used bikes

   Answer: D

**Write the number as a product of primes.**
52) 63
   A) 3 · 7          B) 7 · 7          C) 9 · 3          D) 3 · 3 · 7

   Answer: D

53) 539
   A) 7 · 11          B) 7 · 7 · 11          C) 7 · 11 · 11          D) 7 · 7

   Answer: B

54) 69
   A) 4 · 25          B) 3 · 25          C) 3 · 23          D) 22 · 5

   Answer: C

55) 70
   A) 5 · 5 · 2          B) 2 · 2 · 7          C) 2 · 5 · 7 · 7          D) 2 · 5 · 7

   Answer: D

56) 350

    A) $2 \cdot 2 \cdot 5 \cdot 7$          B) $2 \cdot 5 \cdot 5 \cdot 7$          C) $2 \cdot 5 \cdot 7$          D) $5 \cdot 5 \cdot 5 \cdot 7$

    Answer: B

**Simplify.**

57) $\dfrac{5}{20}$

    A) $\dfrac{4}{5}$          B) $\dfrac{1}{4}$          C) $\dfrac{1}{5}$          D) $\dfrac{5}{20}$

    Answer: B

58) $\dfrac{24}{54}$

    A) $\dfrac{4}{6}$          B) $\dfrac{6}{9}$          C) $\dfrac{24}{54}$          D) $\dfrac{4}{9}$

    Answer: D

59) $\dfrac{65}{117}$

    A) $\dfrac{5}{9}$          B) $\dfrac{13}{9}$          C) $\dfrac{5}{13}$          D) $\dfrac{65}{117}$

    Answer: A

60) $\dfrac{70}{90}$

    A) $\dfrac{70}{90}$          B) $\dfrac{7}{9}$          C) $\dfrac{10}{9}$          D) $\dfrac{7}{10}$

    Answer: B

61) $\dfrac{75}{125}$

    A) $\dfrac{25}{5}$          B) $\dfrac{3}{5}$          C) $\dfrac{3}{25}$          D) $\dfrac{75}{125}$

    Answer: B

62) $\dfrac{65}{90}$

    A) $\dfrac{13}{5}$          B) $\dfrac{65}{90}$          C) $\dfrac{13}{18}$          D) $\dfrac{5}{18}$

    Answer: C

63) $\dfrac{51}{42}$

    A) $\dfrac{14}{17}$          B) $\dfrac{17}{14}$          C) $\dfrac{14}{3}$          D) $\dfrac{51}{42}$

    Answer: B

64) $\dfrac{27}{36}$

    A) $\dfrac{3}{4}$          B) $\dfrac{9}{4}$          C) $\dfrac{4}{3}$          D) $\dfrac{1}{9}$

    Answer: A

**Perform the indicated operation.**

65) $\dfrac{1}{5} \cdot \dfrac{1}{8}$

    A) $\dfrac{1}{40}$          B) $\dfrac{5}{8}$          C) 40          D) $\dfrac{2}{13}$

    Answer: A

66) $\dfrac{7}{5} \cdot \dfrac{4}{7}$

    A) $\dfrac{4}{5}$          B) $\dfrac{14}{5}$          C) $\dfrac{43}{35}$          D) $\dfrac{2}{5}$

    Answer: A

67) $\dfrac{49}{18} \cdot 2$

    A) $\dfrac{40}{9}$          B) $\dfrac{85}{18}$          C) $\dfrac{49}{9}$          D) 4

    Answer: C

68) $\dfrac{5}{13} \div \dfrac{7}{15}$

    A) $\dfrac{75}{91}$          B) $\dfrac{75}{89}$          C) $\dfrac{73}{91}$          D) $\dfrac{74}{91}$

    Answer: A

69) $\dfrac{1}{13} \div \dfrac{3}{17}$

    A) $\dfrac{17}{37}$          B) $\dfrac{17}{39}$          C) $\dfrac{16}{39}$          D) $\dfrac{15}{39}$

    Answer: B

70) $\dfrac{7}{19} \div \dfrac{1}{9}$

    A) $\dfrac{7}{171}$          B) $\dfrac{171}{7}$          C) $\dfrac{2}{7}$          D) $\dfrac{63}{19}$

    Answer: D

71) $\frac{21}{10} \div \frac{35}{6}$

    A) $\frac{9}{35}$                B) $\frac{9}{25}$                C) $\frac{18}{50}$                D) $\frac{9}{10}$

    Answer: B

72) $\frac{18}{5} \div \frac{2}{5}$

    A) 8                B) $\frac{15}{2}$                C) 10                D) 9

    Answer: D

73) $\frac{20}{9} \div 10$

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

    Answer: A

**Add or subtract. Simplify the answer.**

74) $\frac{10}{11} + \frac{1}{11}$

    A) 1                B) $\frac{1}{2}$                C) $\frac{11}{22}$                D) $\frac{11}{11}$

    Answer: A

75) $\frac{3}{8} + \frac{3}{8}$

    A) $\frac{2}{3}$                B) $\frac{2}{4}$                C) $\frac{3}{4}$                D) $\frac{4}{5}$

    Answer: C

76) $\frac{4}{11} + \frac{6}{11}$

    A) $\frac{11}{12}$                B) $\frac{9}{10}$                C) $\frac{10}{11}$                D) $\frac{9}{11}$

    Answer: C

77) $\frac{3}{8} - \frac{2}{8}$

    A) $\frac{1}{4}$                B) $\frac{1}{8}$                C) $\frac{3}{16}$                D) $\frac{1}{2}$

    Answer: B

78) $\dfrac{9}{10} - \dfrac{1}{10}$

    A) $\dfrac{4}{5}$          B) $\dfrac{8}{0}$          C) $\dfrac{8}{20}$          D) $\dfrac{8}{10}$

    Answer: A

79) $\dfrac{25}{60} - \dfrac{24}{60}$

    A) $\dfrac{1}{60}$          B) $\dfrac{1}{120}$          C) $\dfrac{49}{60}$          D) 10

    Answer: A

80) $\dfrac{8}{17} + \dfrac{4}{17}$

    A) $\dfrac{11}{16}$          B) $\dfrac{13}{18}$          C) $\dfrac{12}{17}$          D) $\dfrac{11}{17}$

    Answer: C

81) $\dfrac{11}{62} + \dfrac{13}{62}$

    A) $\dfrac{13}{32}$          B) $\dfrac{11}{30}$          C) $\dfrac{11}{31}$          D) $\dfrac{12}{31}$

    Answer: D

82) $\dfrac{7}{8} + \dfrac{1}{10}$

    A) $\dfrac{4}{9}$          B) $\dfrac{39}{9}$          C) $\dfrac{39}{40}$          D) $\dfrac{4}{40}$

    Answer: C

83) $\dfrac{6}{7} - \dfrac{4}{8}$

    A) $\dfrac{1}{28}$          B) $\dfrac{20}{7}$          C) $\dfrac{5}{14}$          D) $\dfrac{2}{7}$

    Answer: C

84) $\dfrac{1}{5} - \dfrac{1}{13}$

    A) $\dfrac{8}{5}$          B) $\dfrac{1}{65}$          C) $\dfrac{1}{5}$          D) $\dfrac{8}{65}$

    Answer: D

85) $\dfrac{5}{9} + \dfrac{1}{6}$

    A) $\dfrac{2}{5}$          B) $\dfrac{1}{9}$          C) $\dfrac{13}{18}$          D) $\dfrac{17}{18}$

    Answer: C

86) $\dfrac{5}{9} - \dfrac{1}{7}$

    A) $\dfrac{26}{9}$          B) $\dfrac{26}{63}$          C) $\dfrac{4}{9}$          D) $\dfrac{4}{63}$

Answer: B

87) $\dfrac{3}{4} + \dfrac{1}{8}$

    A) $\dfrac{7}{8}$          B) $\dfrac{1}{2}$          C) $\dfrac{29}{32}$          D) $\dfrac{1}{3}$

Answer: A

88) $\dfrac{3}{10} - \dfrac{1}{35}$

    A) $\dfrac{2}{7}$          B) $\dfrac{1}{35}$          C) $\dfrac{19}{70}$          D) $\dfrac{19}{350}$

Answer: C

89) $\dfrac{11}{12} - \dfrac{9}{20}$

    A) $\dfrac{7}{15}$          B) $\dfrac{7}{60}$          C) $\dfrac{1}{30}$          D) $\dfrac{23}{30}$

Answer: A

90) $\dfrac{11}{14} + \dfrac{1}{10}$

    A) $\dfrac{6}{35}$          B) $\dfrac{4}{5}$          C) $\dfrac{31}{12}$          D) $\dfrac{31}{35}$

Answer: D

91) $\dfrac{9}{7} - \dfrac{5}{42}$

    A) $\dfrac{2}{21}$          B) 7          C) $\dfrac{1}{6}$          D) $\dfrac{7}{6}$

Answer: D

92) $9 + \dfrac{3}{8}$

    A) $\dfrac{53}{8}$          B) 3          C) $\dfrac{3}{2}$          D) $\dfrac{75}{8}$

Answer: D

93) $4 - \dfrac{5}{7}$

    A) $\dfrac{15}{7}$          B) $\dfrac{25}{7}$          C) $-\dfrac{33}{7}$          D) $\dfrac{23}{7}$

    Answer: D

94) $\dfrac{13}{5} - 2$

    A) $\dfrac{3}{5}$          B) $\dfrac{63}{5}$          C) 11          D) $\dfrac{11}{5}$

    Answer: A

95) $8 - \dfrac{7}{5}$

    A) $\dfrac{33}{5}$          B) $\dfrac{7}{3}$          C) $\dfrac{47}{5}$          D) $\dfrac{1}{5}$

    Answer: A

**Perform the indicated operation. If the fraction is undefined, say so.**

96) $\dfrac{13}{13}$

    A) 13          B) 1          C) $\dfrac{1}{13}$          D) 0

    Answer: B

97) $\dfrac{45}{1}$

    A) $\dfrac{1}{45}$          B) 45          C) 44          D) undefined

    Answer: B

98) $\dfrac{0}{14}$

    A) 14          B) 0          C) $\dfrac{1}{14}$          D) undefined

    Answer: B

99) $\dfrac{18}{0}$

    A) 0          B) 18          C) $\dfrac{1}{18}$          D) undefined

    Answer: D

100) $\dfrac{122}{1}$

   A) 0         B) 122         C) $\dfrac{1}{122}$         D) undefined

   Answer: B

101) $\dfrac{345}{0}$

   A) 1         B) 0         C) $\dfrac{1}{17}$         D) undefined

   Answer: D

102) $\dfrac{6124}{6124}$

   A) 1         B) $\dfrac{1}{9124}$         C) 0         D) undefined

   Answer: A

103) $\dfrac{123}{143} \cdot \dfrac{143}{123}$

   A) 143         B) 1         C) 0         D) undefined

   Answer: B

104) $\dfrac{127}{136} - \dfrac{127}{136}$

   A) 1         B) 0         C) $\dfrac{1}{136}$         D) undefined

   Answer: B

**Evaluate the expression for the given value or values.**

105) $\dfrac{y}{z}$, for $y = 20$ and $z = 5$

   A) -5         B) 5         C) -4         D) 4

   Answer: D

106) $\dfrac{x}{5} + \dfrac{y}{5}$   for $x = 15$, $y = 30$

   A) 45         B) 9         C) 33         D) 21

   Answer: B

107) $\dfrac{x}{w} \div \dfrac{y}{z}$ for $w = 2$, $x = 7$, $y = 4$ and $z = 14$

   A) $\dfrac{49}{4}$         B) $\dfrac{4}{49}$         C) 1         D) $\dfrac{1}{49}$

   Answer: A

108) $\dfrac{y}{z} \cdot \dfrac{w}{x}$ for w = 6, x = 3, y = 2 and z = 18

    A) $\dfrac{2}{9}$          B) $\dfrac{9}{2}$          C) $\dfrac{1}{18}$          D) 18

    Answer: A

109) $\dfrac{x}{w} - \dfrac{y}{z}$ for w = 4, x = 7, y = 2 and z = 28

    A) $\dfrac{47}{4}$          B) $\dfrac{47}{28}$          C) $\dfrac{51}{28}$          D) $\dfrac{47}{7}$

    Answer: B

**Use a calculator to compute. Round the result to two decimal places.**

110) $\dfrac{9}{64} \cdot \dfrac{8}{20}$

    A) 0.66          B) 0.06          C) 0.07          D) 0.65

    Answer: B

111) $\dfrac{11}{13} \cdot \dfrac{21}{23}$

    A) 0.77          B) 6.42          C) 0.89          D) 0.11

    Answer: A

112) $\dfrac{32}{15} \div \dfrac{24}{25}$

    A) 20          B) 1.00          C) 2.22          D) 6.67

    Answer: C

113) $\dfrac{271}{371} - \dfrac{161}{503}$

    A) 0.83          B) 0.00          C) 1.05          D) 0.41

    Answer: D

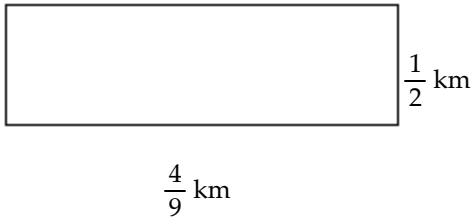114) $\dfrac{773}{958} + \dfrac{463}{817}$

    A) 1.37          B) 1.43          C) 0.70          D) 0.00

    Answer: A

**Solve the problem.**

115) A rectangular plot of land has a length of $\frac{4}{9}$ km and a width of $\frac{1}{2}$ km. What is the area of this plot?



$\frac{1}{2}$ km

$\frac{4}{9}$ km

A) $\frac{4}{18}$ square km      B) $\frac{2}{9}$ square km      C) $\frac{5}{11}$ square km      D) $\frac{4}{11}$ square km

Answer: B

116) A piece of cheese weighing $\frac{2}{3}$ pound is to be divided into 8 equal portions. What will be the weight of each portion?

A) $\frac{4}{3}$ lb      B) $\frac{16}{3}$ lb      C) $\frac{1}{12}$ lb      D) 12 lb

Answer: C

117) A tutor charges $79 for a tutoring session that lasts for t hours. Complete the table to help find an expression that describes the cost (in dollars) per hour. (Show the arithmetic in order to see a pattern.)

| Total Time (hours) | Cost per Hour (dollars per hour) |
|---|---|
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| t | |

A)

| Total Time (hours) | Cost per Hour (dollars per hour) |
|---|---|
| 2 | 2 · 79 |
| 3 | 3 · 79 |
| 4 | 4 · 79 |
| 5 | 5 · 79 |
| t | t · 79 |

B)

| Total Time (hours) | Cost per Hour (dollars per hour) |
|---|---|
| 2 | 2 + 79 |
| 3 | 3 + 79 |
| 4 | 4 + 79 |
| 5 | 5 + 79 |
| t | t + 79 |

C)

| Total Time (hours) | Cost per Hour (dollars per hour) |
|---|---|
| 2 | $\dfrac{2}{79}$ |
| 3 | $\dfrac{3}{79}$ |
| 4 | $\dfrac{4}{79}$ |
| 5 | $\dfrac{5}{79}$ |
| t | $\dfrac{t}{79}$ |

D)

| Total Time (hours) | Cost per Hour (dollars per hour) |
|---|---|
| 2 | $\dfrac{79}{2}$ |
| 3 | $\dfrac{79}{3}$ |
| 4 | $\dfrac{79}{4}$ |
| 5 | $\dfrac{79}{5}$ |
| t | $\dfrac{79}{t}$ |

Answer: D

**Solve. Simplify the answer.**

118) Ian walked $\dfrac{2}{20}$ mile to his biology class, $\dfrac{3}{20}$ mile to his art class, $\dfrac{4}{20}$ mile to his calculus class, and then back to

his dormitory. If he walked 1 mile altogether, how far did he walk from his calculus class to his dormitory?

A) $\dfrac{3}{4}$ mi
B) $\dfrac{9}{20}$ mi
C) $\dfrac{11}{20}$ mi
D) $\dfrac{7}{10}$ mi

Answer: C

119) Erika spent $\dfrac{3}{4}$ hr on her computer visiting the History Channel and the Discovery Channel websites. She spent

$\dfrac{1}{4}$ hr at the History Channel website. How many hours did she spend at the Discovery Channel website?

A) $\dfrac{1}{2}$ hr
B) $\dfrac{11}{16}$ hr
C) $\dfrac{1}{8}$ hr
D) $\dfrac{7}{16}$ hr

Answer: A

120) The probability that an event does not occur may be found by subtracting the probability that the event does

occur from 1.  If the probability that Luis passes his driving test is $\dfrac{3}{5}$, what is the probability that he does not

pass his driving test?

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

Answer: C

121) The front cover of a book measures $\dfrac{17}{2}$ inches by $\dfrac{33}{5}$ inches. What is the total distance around (the perimeter of)

the front cover of the book?

A) $\dfrac{151}{10}$ in.
B) $\dfrac{147}{5}$ in.
C) $\dfrac{151}{5}$ in.
D) $\dfrac{148}{5}$ in.

Answer: C

**Compute.**

122) –(-14)

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

Answer: A

123) –(-4)

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

Answer: C

124) –(-12)

    A) -12          B) $-\frac{1}{12}$          C) 0          D) 12

Answer: D

125) –(–(–21))

    A) 21          B) -21          C) 0          D) $\frac{1}{21}$

Answer: B

126) |2|

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

Answer: B

127) |-14|

    A) 0          B) -14          C) 14          D) $-\frac{1}{14}$

Answer: C

128) |-19|

    A) -19          B) $-\frac{1}{19}$          C) 0          D) 19

Answer: D

129) –|22|

    A) 0          B) 22          C) $\frac{1}{22}$          D) -22

Answer: D

130) –|24|

    A) -24          B) 0          C) $-\frac{1}{24}$          D) 24

Answer: A

131) $-|-7|$

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

    Answer: C

**Find the sum.**

132) 5 + (-8)

    A) 3          B) 13          C) -13          D) -3

    Answer: D

133) −9 + 13

    A) -22          B) -4          C) 22          D) 4

    Answer: D

134) −9 + (-6)

    A) -15          B) 3          C) 15          D) -3

    Answer: A

135) 9 + (-18)

    A) -27          B) 27          C) 9          D) -9

    Answer: D

136) −23 + 15

    A) 8          B) -8          C) 38          D) -38

    Answer: B

137) −23 + (-7)

    A) 16          B) -16          C) 30          D) -30

    Answer: D

138) 21 + (−10)

    A) 31          B) -11          C) 11          D) -31

    Answer: C

139) −17 + 20

    A) 37          B) 3          C) -37          D) -3

    Answer: B

140) −35 + (−21)

    A) 56          B) -14          C) 14          D) -56

    Answer: D

141) 22 + (−22)

    A) −22          B) 44          C) 22          D) 0

    Answer: D

142) −44 + (−44)

    A) −88          B) 88          C) −44          D) 0

    Answer: A

143) 28 + (-42)

    A) 14                        B) -14                C) 70               D) -70

    Answer: B

144) -52 + 27

    A) 79                        B) -25                C) -79              D) 25

    Answer: B

145) -80 + (-51)

    A) 29                        B) 131               C) -29              D) -131

    Answer: D

146) 80 + (-156)

    A) 236                      B) 76                C) -76              D) -236

    Answer: C

147) -38 + 159

    A) -121                    B) 121               C) -197            D) 197

    Answer: B

148) -55 + (-157)

    A) -102                    B) 102               C) -212            D) 212

    Answer: C

149) -714 + (-3645)

    A) -4359                 B) -2931           C) 4359            D) 2931

    Answer: A

150) −453 + 618

    A) −1071                B) 165               C) −165            D) 65

    Answer: B

151) −526 + 271

    A) −797                  B) 155               C) − 255           D) 255

    Answer: C

152) −163 + (−625)

    A) −462                  B) −788             C) −362           D) 462

    Answer: B

153) 50,924 + (−50,924)

    A) −24                  B) −101,848       C) 101,848        D) 0

    Answer: D

154) −13.7 + (-20.1)

    A) 33.8                  B) 6.4               C) −6.4           D) -33.8

    Answer: D

155) 5.8 + (-20.1)

    A) 14.3                 B) -14.3                 C) -25.9                 D) 25.9

    Answer: B

156) 5.2 + (−9.9)

    A) -4.7                 B) -15.1                 C) 15.1                 D) 4.7

    Answer: A

157) −23.7 + 16.5

    A) -7.2                 B) 40.2                 C) -40.2                 D) 7.2

    Answer: A

158) −8.4 + (−2.1)

    A) 6.3                 B) −10.5                 C) 10.5                 D) -6.3

    Answer: B

159) $\frac{2}{9} + \left(-\frac{1}{9}\right)$

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

    Answer: B

160) $-\frac{3}{10} + \frac{2}{5}$

    A) $\frac{1}{10}$                 B) $-\frac{7}{10}$                 C) $\frac{7}{10}$                 D) $-\frac{1}{10}$

    Answer: A

161) $-\frac{1}{3} + \left(-\frac{5}{9}\right)$

    A) $\frac{2}{9}$                 B) $\frac{8}{9}$                 C) $-\frac{8}{9}$                 D) $-\frac{2}{9}$

    Answer: C

162) $\frac{7}{48} + \left(-\frac{7}{48}\right)$

    A) $-\frac{7}{24}$                 B) $\frac{7}{24}$                 C) 0                 D) $\frac{7}{12}$

    Answer: C

163) $-\frac{1}{4} + \left(-\frac{1}{6}\right)$

    A) $-\frac{2}{3}$                 B) $-\frac{1}{12}$                 C) $-\frac{2}{9}$                 D) $-\frac{5}{12}$

    Answer: D

**Use a calculator to find the sum. Round the result to two decimal places.**

164) 687.92 + (–80.91)

    A) 607.92          B) –607.01          C) 768.83          D) 607.01

    Answer: D

165) –25.93 + (–11.49)

    A) 37.42          B) –14.44          C) –37.42          D) 14.44

    Answer: C

166) –13.37 + 48.76

    A) –62.13          B) 35.39          C) 62.13          D) –35.39

    Answer: B

167) –133.76 + 32.19

    A) –101.57          B) 162.00          C) –100.57          D) –165.95

    Answer: A

168) –102.02 + (–21.38)

    A) 123.40          B) –80.64          C) 80.64          D) –123.40

    Answer: D

169) -11,738.14 + $\left(-93{,}405.78\right)$

    A) -81,667.64          B) 105,143.92          C) 81,667.64          D) -105,143.92

    Answer: D

170) $\dfrac{241}{369} + \left(-\dfrac{103}{513}\right)$

    A) 0.45          B) 0.85          C) -0.96          D) 0.16

    Answer: A

171) $-\dfrac{768}{935} + \left(-\dfrac{477}{895}\right)$

    A) 1.35          B) -0.68          C) -1.35          D) -31.12

    Answer: C

**Find the difference.**

172) $x + y$, for $x = 6$ and $y = -8$

    A) -48          B) 14          C) -2          D) -14

    Answer: C

173) $y + x$, for $x = -5$ and $y = 8$

    A) 13          B) -13          C) -40          D) 3

    Answer: D

174) $a + b$, for $a = 1$ and $b = -2$

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

    Answer: A

175) b + a, for a = -1 and b = 0

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

Answer: A

176) c + d, for c = -3 and d = -2

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

Answer: A

177) d + c, for c = -1 and d = 10

    A) -11               B) 9                 C) 11                 D) -9

Answer: B

**Let x be a number. Translate the English phrase into a mathematical expression.**

178) The total of –106 and a number

    A) –106            B) –106 + x          C) –106x            D) 106 – x

Answer: B

179) The sum of a number and –37

    A) –37x             B) x + 37            C) –37             D) x + (–37)

Answer: D

180) –81 increased by a number

    A) –81 + x          B) –81 ÷ x           C) –81x            D) x + 81

Answer: A

**Solve the problem.**

181) A check register is shown in the table below. Find the final balance of the checking account.

| Check Register | | | | | |
|---|---|---|---|---|---|
| Check Number | Date | Description of Transaction | Payment | Deposit | Balance |
| | | | | | -42.32 |
| | 12/20 | Paycheck | | 815.46 | |
| 1752 | 12/22 | Petcom | 26.62 | | |
| 1753 | 12/22 | Park & Shop | 187.12 | | |
| | 1/02 | ATM | 100.00 | | |
| | 1/09 | Rebate | | 17.29 | |

A)

| Check Register | | | | | |
|---|---|---|---|---|---|
| Check Number | Date | Description of Transaction | Payment | Deposit | Balance |
| | | | | | -42.32 |
| | 12/20 | Paycheck | | 815.46 | 773.14 |
| 1752 | 12/22 | Petcom | 26.62 | | 799.76 |
| 1753 | 12/22 | Park & Shop | 187.12 | | 986.88 |
| | 1/02 | ATM | 100.00 | | 1086.88 |
| | 1/09 | Rebate | | 17.29 | 1104.17 |

The final balance of the checking account is 1104.17 dollars.

B)

| Check Register | | | | | |
|---|---|---|---|---|---|
| Check Number | Date | Description of Transaction | Payment | Deposit | Balance |
| | | | | | -42.32 |
| | 12/20 | Paycheck | | 815.46 | 773.14 |
| 1752 | 12/22 | Petcom | 26.62 | | 746.52 |
| 1753 | 12/22 | Park & Shop | 187.12 | | 559.40 |
| | 1/02 | ATM | 100.00 | | 459.40 |
| | 1/09 | Rebate | | 17.29 | 476.69 |

The final balance of the checking account is 476.69 dollars.

C)

| Check Register | | | | | |
|---|---|---|---|---|---|
| Check Number | Date | Description of Transaction | Payment | Deposit | Balance |
| | | | | | -42.32 |
| | 12/20 | Paycheck | | 815.46 | -857.78 |
| 1752 | 12/22 | Petcom | 26.62 | | -831.16 |
| 1753 | 12/22 | Park & Shop | 187.12 | | -644.04 |
| | 1/02 | ATM | 100.00 | | -544.04 |
| | 1/09 | Rebate | | 17.29 | -561.33 |

The final balance of the checking account is -561.33 dollars.

D)

| Check Register | | | | | |
|---|---|---|---|---|---|
| Check Number | Date | Description of Transaction | Payment | Deposit | Balance |
| | | | | | -42.32 |
| | 12/20 | Paycheck | | 815.46 | 773.14 |
| 1752 | 12/22 | Petcom | 26.62 | | 746.52 |
| 1753 | 12/22 | Park & Shop | 187.12 | | 559.40 |
| | 1/02 | ATM | 100.00 | | 459.40 |
| | 1/09 | Rebate | | 17.29 | 442.11 |

The final balance of the checking account is 442.11 dollars.

Answer: B

182) A pet store is offering a sale of $10 off the retail price of any of its pet beds or pet carriers.

(i) Complete the table below to help find an expression that describes the sale price (in dollars) if the retail price is r dollars. Show the arithmetic to help you see a pattern.
(ii) Evaluate the expression you found in part (i) for r = 52. What does your result mean in this situation?

| Retail and Sale Prices | |
|---|---|
| Retail Price (dollars) | Sale Price (dollars) |
| 45 | |
| 50 | |
| 55 | |
| 60 | |
| r | |

A) (i)

| Retail and Sale Prices | |
|---|---|
| Retail Price (dollars) | Sale Price (dollars) |
| 45 | 45 + (-10) |
| 50 | 50 + (-20) |
| 55 | 55 + (-30) |
| 60 | 60 + (-40) |
| r | r + (-50) |

(ii) 52 + (-50) = 2; This means that if the pet bed or pet carrier was originally retail priced at $52, it would be on sale for $2.

B) (i)

| Retail and Sale Prices | |
|---|---|
| Retail Price (dollars) | Sale Price (dollars) |
| 45 | 45 + (-10) |
| 50 | 50 + (-10) |
| 55 | 55 + (-10) |
| 60 | 60 + (-10) |
| r | r + (-10) |

(ii) 52 + (-10) = 42; This means that if the pet bed or pet carrier was originally retail priced at $52, it would be on sale for $42.

C) (i)

| Retail and Sale Prices | |
|---|---|
| Retail Price (dollars) | Sale Price (dollars) |
| 45 | 45 + (-10) |
| 50 | 50 + (-15) |
| 55 | 55 + (-20) |
| 60 | 60 + (-25) |
| r | r + (-30) |

(ii) 52 + (-30) = 22; This means that if the pet bed or pet carrier was originally retail priced at $52, it would be on sale for $22.

D) (i)

| Retail and Sale Prices | |
|---|---|
| Retail Price (dollars) | Sale Price (dollars) |
| 45 | 45 + 10 |
| 50 | 50 + 10 |
| 55 | 55 + 10 |
| 60 | 60 + 10 |
| r | r + 10 |

(ii) 52 + 10 = 62; This means that if the pet bed or pet carrier was originally retail priced at $52, it would be now cost $62.

Answer: B

183) On part of a scenic tour of underground caves, Dave and Neil started at an elevation of –45 feet. They then rose 11 feet. What was their elevation at this point?

A) 56 ft          B) 34 ft          C) -34 ft          D) -56 ft

Answer: C

184) Sean has $379 in his savings account. After he withdraws $65, what will his balance be?

A) $444          B) –$444          C) –$314          D) $314

Answer: D

185) Mr Lu Yi owed $150 on his bank credit card. He charged another item costing $18 . Find the amount that Lu Yi owed the bank.

A) $132          B) $171          C) $130          D) $168

Answer: D

186) At the start of a chemistry experiment, Sarah measured the temperature of a liquid to be –2°C. At the end of the experiment, it had risen 42°C. What was the liquid's temperature at the end of the experiment?

A) 44°C          B) 40°C          C) -44°C          D) -40°C

Answer: B

187) The temperature at 5:00 was -7°C. Four hours later, it was -11°C. What was the change in temperature?

A) 4°C          B) 18°C          C) -18°C          D) -4°C

Answer: D

188) A corporation's bank account has $5358 in it when the treasurer writes checks for $5781, $2149, and $2605. Then deposits of $477 and $5976 are made. How much is in the account? Is it overdrawn?

A) $9440, no          B) $3881, no          C) -$9440, yes          D) $1276, no

Answer: D

**Find the difference.**

189) 8 – 5

A) 5          B) 3          C) –3          D) 13

Answer: B

190) –4 - 15

A) -11          B) -19          C) 11          D) 19

Answer: B

191) –13 – (-3)

A) 16          B) -10          C) -16          D) 10

Answer: B

192) 9 – (-6)

A) 3          B) 15          C) -3          D) -15

Answer: B

193) 19 – 19

A) 1          B) –19          C) 19          D) 0

Answer: D

194) 0 – 10
    A) 10                B) 0                C) –10                D) –(–10)
    Answer: C

195) –14 – 14
    A) 0                B) –14                C) 28                D) –28
    Answer: D

196) –15 – (–15)
    A) 15                B) –15                C) 0                D) 1
    Answer: C

197) 0 – (–14)
    A) 28                B) 0                C) –14                D) 14
    Answer: D

198) 9 – (–9)
    A) –18                B) 9                C) 18                D) 0
    Answer: C

199) -11 – 18
    A) 29                B) -7                C) 7                D) -29
    Answer: D

200) -10 – (–24)
    A) -34                B) 34                C) 14                D) -14
    Answer: C

201) –10 - 90
    A) -80                B) 100                C) -100                D) 80
    Answer: C

202) –70 – (- 90)
    A) 160                B) 20                C) -20                D) -160
    Answer: B

203) 476 – (-3645)
    A) 4121                B) 3169                C) -4121                D) -3169
    Answer: A

204) 819 – 294
    A) –525                B) 425                C) 525                D) –1113
    Answer: C

205) – 573 – 756
    A) 183                B) –183                C) –1329                D) –83
    Answer: C

206) – 254 – (–716)

    A) –970               B) –462               C) –362               D)  462

Answer: D

207) -357 – (-2187)

    A) -2544              B) 2544               C) 1830               D) -1830

Answer: C

208) –364 – 927

    A) –1291              B) 563                C) –463               D) –563

Answer: A

209) –20.3 – (-8.0)

    A) 28.3                B) -28.3              C) 12.3               D) -12.3

Answer: D

210)  -6.9 – 7.8

    A) 14.7                B) -14.7              C) 0.9                D) -0.9

Answer: B

211) 4 – 8

    A) 4                  B) 12                 C) -4                 D) -12

Answer: C

212) –39.75 – (–12.58 )

    A) –52.33              B) –27.17             C) 52.33              D) 27.17

Answer: B

213) (0.67) – (–0.17)

    A) 0.84                B) -0.5               C) -0.4               D) -0.1139

Answer: A

214) 0.70 – (-0.57)

    A) 1.27                B) 0.13               C) 1.37               D) 0.399

Answer: A

215) $-\dfrac{2}{5} - \dfrac{1}{25}$

    A) $-\dfrac{11}{25}$          B) $-\dfrac{1}{10}$          C) $-\dfrac{56}{125}$          D) $-\dfrac{3}{25}$

Answer: A

216) $\dfrac{7}{9} - \dfrac{1}{2}$

    A) $\dfrac{2}{3}$             B) $\dfrac{5}{9}$            C) $\dfrac{1}{3}$            D) $\dfrac{5}{18}$

Answer: D

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

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

Answer: B

218) $-\frac{1}{2} - \frac{8}{9}$

A) $-\frac{13}{90}$  B) $-\frac{25}{18}$  C) $-\frac{7}{18}$  D) $\frac{25}{18}$

Answer: B

219) $-\frac{1}{8} - \left( -\frac{3}{5} \right)$

A) $\frac{29}{40}$  B) $-\frac{1}{10}$  C) $\frac{19}{40}$  D) $-\frac{29}{40}$

Answer: C

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

A) 3  B) $-\frac{4}{3}$  C) - 3  D) $\frac{2}{3}$

Answer: A

221) $\frac{1}{2} - \left( -\frac{5}{14} \right)$

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

Answer: C

222) $\frac{1}{20} - \left( -\frac{3}{16} \right)$

A) $-\frac{1}{5}$  B) $\frac{7}{80}$  C) $-\frac{19}{80}$  D) $\frac{19}{80}$

Answer: D

**Use a calculator to compute. Round the result to two decimal places.**

223) $-113.21 - 20.93$

A) 92.28  B) $-134.14$  C) 134.14  D) $-92.28$

Answer: B

224) $-114.95 - 31.34$

A) $-83.61$  B) 146.29  C) $-146.29$  D) 83.61

Answer: C

225) -11,251.09 – 94,470.372

    A) 83,219.28          B) -105,721.46          C) -83,219.28          D) -11,251.09

Answer: B

226) $-\dfrac{27}{34} - \dfrac{19}{50}$

    A) 0.09          B) -0.41          C) -1.17          D) 0.00

Answer: C

227) $-\dfrac{71}{98} - \left(-\dfrac{49}{85}\right)$

    A) -0.12          B) -0.15          C) -1.69          D) -1.30

Answer: B

**Solve the problem.**

228) The temperature at 5:00 was -4°C. Four hours later, it was -10°C. What was the change in temperature?

    A) 14°C          B) -14°C          C) -6°C          D) 6°C

Answer: C

229) The temperature on a March morning is -6°F at 3a.m. If the temperature drops 5° by 4 a.m., rises 9° by 5 a.m., and then drops 8° by 6a.m., find the temperature at 6 a.m.

    A) 28°F          B) -10°F          C) -28°F          D) 10°F

Answer: B

230) At the start of a chemistry experiment, Sarah measured the temperature of a liquid to be –17°C. At the end of the experiment, it had risen 33°C. What was the liquid's temperature at the end of the experiment?

    A) 16°C          B) 50°C          C) -16°C          D) -50°C

Answer: A

231) Sean has $453 in his savings account. After he withdraws $38, what will his balance be?

    A) –$491          B) $415          C) $491          D) –$415

Answer: B

232) Leah has $178 in her checking account.  She writes a check for $45, makes a deposit for $102, and then writes another check for $101. Find the amount left in her account.

    A) -134 dollars          B) 70 dollars          C) -70 dollars          D) 134 dollars

Answer: D

233) The changes in retail sales (in billions of dollars) of hand–held computer games in Country X from one year to the next are given in the following table.

Changes in Retail Sales of Hand–Held
Computer Games

| Years | Changes in Retail Sales (billions of dollars) |
|---|---|
| 1998–1999 | 0.0 |
| 1999–2000 | -1.4 |
| 2000–2001 | -0.4 |
| 2001–2002 | 0.0 |
| 2002–2003 | 1.1 |
| 2003–2004 | 2.0 |
| 2004–2005 | 1.8 |

(i) If there were $8.3 billion in sales in 1998, what were the sales during 2005?
(ii) During which period(s) were the retail sales increasing?
(iii) During which period(s) were the retail sales decreasing?

A) (i) 23.3 billion;
   (ii) From 2001 to 2005;
   (iii) From 1999 to 2002

B) (i) $11.4 billion;
   (ii) From 2002 to 2005;
   (iii) From 1999 to 2001

C) (i) 23.3 billion;
   (ii) From 2002 to 2005;
   (iii) From 1999 to 2001

D) (i) $11.4 billion;
   (ii) From 2001 to 2005;
   (iii) From 1999 to 2002

Answer: B

234) Last year, enrollment at an art school was 19,084 students.
(i) Complete the table below to help find an expression that describes the current enrollment if the change in enrollment in the past year is c students. Show the arithmetic to help you see a pattern.
(ii) Evaluate the expression you find in part (i) for c = -150. What does your result mean in this situation?

Changes in Enrollments and Current Enrollments

| Change in Enrollment | Current Enrollment |
|---|---|
| 70 | |
| 105 | |
| 210 | |
| 315 | |
| 315 | |
| 525 | |
| c | |

A) (i)

Changes in Enrollments and Current Enrollments

| Change in Enrollment | Current Enrollment |
|---|---|
| 70 | 70 – 19,084 |
| 105 | 105 – 19,084 |
| 210 | 210 – 19,084 |
| 315 | 315 – 19,084 |
| 315 | 315 – 19,084 |
| 525 | 525 – 19,084 |
| c | c – 19,084 |

(ii) -19,234; This means that the current enrollment is -19,234 due to a decrease in enrollment of 150 students in the past year.

B) (i)

| Changes in Enrollments and Current Enrollments | |
|---|---|
| Change in Enrollment | Current Enrollment |
| 70 | 19,084 – 70 |
| 105 | 19,084 – 105 |
| 210 | 19,084 – 210 |
| 315 | 19,084 – 315 |
| 315 | 19,084 – 315 |
| 525 | 19,084 – 525 |
| c | 19,084 – c |

(ii) 19,234; This means that the current enrollment is 19,234 due to an increase in enrollment of 150 students in the past year.

C) (i)

| Changes in Enrollments and Current Enrollments | |
|---|---|
| Change in Enrollment | Current Enrollment |
| 70 | 70 + 19,084 |
| 105 | 105 + 19,084 |
| 210 | 210 + 19,084 |
| 315 | 315 + 19,084 |
| 420 | 315 + 19,084 |
| 525 | 525 + 19,084 |
| c | 630c + 19,084 |

(ii) 113,584; This means that the current enrollment is 113,584 due to an increase in enrollment of 94,500 students in the past year.

D) (i)

| Changes in Enrollments and Current Enrollments | |
|---|---|
| Change in Enrollment | Current Enrollment |
| 70 | 70 + 19,084 |
| 105 | 105 + 19,084 |
| 210 | 210 + 19,084 |
| 315 | 315 + 19,084 |
| 315 | 315 + 19,084 |
| 525 | 525 + 19,084 |
| c | c + 19,084 |

(ii) 18,934; This means that the current enrollment is 18,934 due to a decrease in enrollment of 150 students in the past year.

Answer: D

**Evaluate the expression for the given replacement values.**

235) $x + y$, for $x = -7$ and $y = -10$
    A) 17                  B) -17                  C) –3                  D) 3

Answer: B

236) $y + x$, for $x = -9$ and $y = 5$
    A) 4                  B) -4                  C) -14                  D) 14

Answer: B

237) $x – y$     for $x = -21$, $y = 14$
    A) 35                  B) -35                  C) -7                  D) 7

Answer: B

238) x – y      for x = -13, y = -1

    A) -12          B) 14          C) -14          D) 12

    Answer: A

239) x – y      for x = 17, y = -26

    A) 9          B) 43          C) -43          D) -9

    Answer: B

240) x – y      for x = -4, y = -22

    A) 18          B) 26          C) -26          D) -18

    Answer: A

241) x – y      for x = 3, y = 18

    A) 21          B) -21          C) -15          D) 15

    Answer: C

**Let x be a number. Translate the English phrase or sentence into a mathematical expression.**

242) 67 less than a number

    A) $67 \div x$          B) x – 67          C) x + 67          D) 67 – x

    Answer: B

243) –98 minus a number

    A) $-98 \div x$          B) x + 98          C) –98 – x          D) x – 98

    Answer: C

244) Subtract 18 from a number

    A) 18 – x          B) 18          C) 18x          D) x – 18

    Answer: D

245) Subtract –70 from a number.

    A) –70          B) –70x          C) x – (–70)          D) 70 – x

    Answer: C

246) The difference of a number and –52

    A) –52x          B) –52 – x          C) –52 + x          D) x – (–52)

    Answer: D

247) Nine less than a number

    A) x + 9          B) 9x          C) x – 9          D) 9 – x

    Answer: C

248) The number decreased by –68

    A) x – (–68)          B) –68 + x          C) $-68 \div x$          D) –68 – x

    Answer: A

249) 76 decreased by a number

    A) 76 – x          B) $76 \div x$          C) 76 + x          D) x – 76

    Answer: A

250) –16 decreased by a number

    A) x – (–16)             B) –16 ÷ x             C) –16 + x             D) –16 – x

    Answer: D

251) A number decreased by six

    A) x – 6             B) $\dfrac{6}{x}$             C) 6 – x             D) x + 6

    Answer: A

**Write the percentage as a decimal number.**

252) 3%

    A) 3             B) 30.0             C) 0.03             D) 0.3

    Answer: C

253) 92%

    A) 9.2             B) 0.92             C) 0.092             D) 92.0

    Answer: B

254) 70%

    A) 0.59             B) 0.07             C) 7             D) 0.7

    Answer: D

255) 20%

    A) 0.02             B) 2             C) 0.2             D) 20.0

    Answer: C

256) 23%

    A) 0.23             B) 0.023             C) 23.0             D) 2.3

    Answer: A

257) 4.5%

    A) 0.045             B) 0.45             C) 45.0             D) 4.5

    Answer: A

258) 64.3%

    A) 0.0643             B) 64.3             C) 6.43             D) 0.643

    Answer: D

259) 0.3%

    A) 0.004             B) 0.3             C) 0.003             D) 0.03

    Answer: C

**Write the decimal number as a percentage.**

260) 0.1

    A) 100%             B) 10%             C) 0.01%             D) 0.1%

    Answer: B

261) 0.46

     A) 0.046%                   B) 46%                         C) 460%                    D) 4.6%

Answer: B

262) 0.026

     A) 2.6%                     B) 0.026%              C) 26%                    D) 0.26%

Answer: A

263) 0.279

     A) 27.9%                    B) 0.0279%           C) 0.279%              D) 279%

Answer: A

264) 0.008

     A) 0.08%                    B) 8%                         C) 0.8%                   D) 0.008%

Answer: C

**Solve the problem.**

265) Find 5% of 200 cars.

     A) 1 cars                    B) 0.1 cars             C) 10 cars               D) 100 cars

Answer: C

266) Find 10% of 200 boxes.

     A) 0.2 boxes                B) 2 boxes              C) 20 boxes            D) 200 boxes

Answer: C

267) Find 5% of $700.

     A) $35                      B) $350                 C) $3.50              D) $0.35

Answer: A

268) Find 16% of $142,000.

     A) $8875                  B) $22,720          C) $227                 D) $2272

Answer: B

269) Find 24% of 725 workers.

     A) 3021 workers         B) 174 workers        C) 3 workers          D) 551 workers

Answer: B

270) Find 8% of 3200 computers.

     A) 2560 computers      B) 256 computers      C) 26 computers      D) 25,600 computers

Answer: B

271) Find 35% of 1011 oz.

     A) 35.39 oz                B) 353.85 oz         C) 3538.5 oz         D) 35,385 oz

Answer: B

272) Find 82% of 402 km.

     A) 3296.4 km           B) 32.96 km         C) 32,964 km         D) 329.64 km

Answer: D

**Find the product.**

273) -11(18)

    A) -187                 B) -198                 C) 187                 D) -216

Answer: B

274) -9(-1)

    A) 19                 B) 9                 C) 18                 D) -9

Answer: B

275) 10(-2)

    A) -20                 B) -200                 C) -120                 D) -30

Answer: A

276) -19(0)

    A) -38                 B) 0                 C) 19                 D) -19

Answer: B

277) -17(-17)

    A) -306                 B) -289                 C) 306                 D) 289

Answer: D

278) 3(10)

    A) 300                 B) 27                 C) 30                 D) 20

Answer: C

279) -1.7(-13)

    A) –14.7                 B) 22.1                 C) 14.7                 D) -11.3

Answer: B

280) 25(–38)

    A) 1050                 B) 960                 C) –940                 D) –950

Answer: D

281) –58(–305)

    A) –17,700             B) 17,690             C) 17,700             D) –17,690

Answer: B

282) $\left(-\dfrac{2}{7}\right)\left(\dfrac{4}{9}\right)$

    A) $-\dfrac{3}{8}$            B) $-\dfrac{8}{63}$            C) $\dfrac{3}{8}$            D) $\dfrac{8}{63}$

Answer: B

283) $\left(-\dfrac{2}{5}\right)\left(-\dfrac{3}{7}\right)$

    A) $\dfrac{6}{35}$            B) $-\dfrac{5}{12}$            C) $\dfrac{5}{12}$            D) $-\dfrac{6}{35}$

Answer: A

284) $\dfrac{9}{8}\left(-\dfrac{4}{7}\right)$

    A) $\dfrac{9}{14}$          B) $-\dfrac{9}{14}$          C) $-\dfrac{7}{14}$          D) $\dfrac{7}{14}$

Answer: B

285) $\left(-\dfrac{1}{8}\right)\left(-\dfrac{4}{9}\right)$

    A) $-\dfrac{1}{18}$          B) $-\dfrac{5}{17}$          C) $\dfrac{1}{18}$          D) $\dfrac{4}{13}$

Answer: C

**Find the quotient.**

286) $-20 \div 4$

    A) $-200$          B) $-5$          C) $5$          D) $-\dfrac{1}{5}$

Answer: B

287) $-72 \div (-8)$

    A) $-9$          B) $-720$          C) $\dfrac{1}{9}$          D) $9$

Answer: D

288) $60 \div (-6)$

    A) $10$          B) $-600$          C) $-\dfrac{1}{10}$          D) $-10$

Answer: D

289) $\dfrac{-15}{5}$

    A) $-\dfrac{1}{3}$          B) $3$          C) $-3$          D) $-150$

Answer: C

290) $\dfrac{-20}{-4}$

    A) $-200$          B) $\dfrac{1}{5}$          C) $5$          D) $-5$

Answer: C

291) $\dfrac{60}{-10}$

    A) $-6$          B) $-\dfrac{1}{6}$          C) $6$          D) $-600$

Answer: A

292) -3 ÷ (−1)

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

Answer: C

293) -12 ÷ 12

A) −12 　　　　　B) 0 　　　　　C) 1 　　　　　D) −1

Answer: D

294) -140 ÷ 5

A) 28 　　　　　B) $-\frac{1}{28}$ 　　　　　C) -28 　　　　　D) -38

Answer: C

295) 75 ÷ (-5)

A) -25 　　　　　B) -15 　　　　　C) $-\frac{1}{15}$ 　　　　　D) 15

Answer: B

296) -60 ÷ (-4)

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

Answer: A

297) -264 ÷ (33)

A) -8 　　　　　B) -18 　　　　　C) 8 　　　　　D) $-\frac{1}{8}$

Answer: A

298) 637 ÷ (-91)

A) -17 　　　　　B) -7 　　　　　C) $-\frac{1}{7}$ 　　　　　D) 7

Answer: B

299) $\frac{-72}{-3}$

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

Answer: C

300) 972 ÷ (−27)

A) 37 　　　　　B) −37 　　　　　C) −36 　　　　　D) 36

Answer: C

301) −29.7 ÷ (−9)

A) 6.1 　　　　　B) − 3.3 　　　　　C) 3.3 　　　　　D) $-\frac{1}{3.3}$

Answer: C

302) $51.2 \div (-8)$

    A) −6.4          B) 6.1          C) 6.4          D) $-\dfrac{1}{6.4}$

    Answer: A

303) $-43.89 \div 3$

    A) 14.73          B) 14.63          C) −14.63          D) −14.73

    Answer: C

304) $-60.35 \div (-7.1)$

    A) −8.5          B) 8.5          C) 0.85          D) −0.85

    Answer: B

305) $\dfrac{4}{6} \div (-8)$

    A) − 12          B) $-\dfrac{1}{12}$          C) $-\dfrac{16}{3}$          D) $\dfrac{1}{12}$

    Answer: B

306) $-4 \div \left(-\dfrac{5}{17}\right)$

    A) $-\dfrac{5}{68}$          B) $\dfrac{5}{68}$          C) $\dfrac{68}{5}$          D) $-\dfrac{68}{5}$

    Answer: C

307) $\dfrac{1}{4} \div \dfrac{5}{7}$

    A) $\dfrac{20}{7}$          B) $\dfrac{7}{20}$          C) $\dfrac{1}{4}$          D) $\dfrac{5}{28}$

    Answer: B

308) $\dfrac{2}{5} \div \left(-\dfrac{5}{7}\right)$

    A) $\dfrac{7}{2}$          B) $-\dfrac{2}{7}$          C) $\dfrac{25}{14}$          D) $-\dfrac{14}{25}$

    Answer: D

309) $\left(-\dfrac{4}{9}\right) \div \left(-\dfrac{7}{3}\right)$

    A) $\dfrac{4}{21}$          B) $-\dfrac{21}{4}$          C) $-\dfrac{27}{28}$          D) $\dfrac{28}{27}$

    Answer: A

310) $-\dfrac{6}{7} \div \dfrac{9}{2}$

    A) $-\dfrac{21}{4}$          B) $-\dfrac{7}{27}$          C) $-\dfrac{4}{21}$          D) $\dfrac{27}{7}$

    Answer: C

311) $\left(-\dfrac{5}{11}\right) \div \left(-\dfrac{35}{22}\right)$

    A) $-\dfrac{7}{2}$          B) $-\dfrac{2}{7}$          C) $\dfrac{7}{2}$          D) $\dfrac{2}{7}$

    Answer: D

312) $-178.5 \div (-15)$

    A) $-119$          B) $-129$          C) $11.9$          D) $12.9$

    Answer: C

313) $-757.99 \div 22.9$

    A) $3.31$          B) $-33.1$          C) $33.1$          D) $-3.31$

    Answer: B

314) $-340.71 \div 0$

    A) $-\dfrac{1}{340.71}$          B) $-340.71$          C) undefined          D) $0$

    Answer: C

**Simplify.**

315) $\dfrac{-80}{-10}$

    A) $8$          B) $\dfrac{1}{8}$          C) $-8$          D) $-800$

    Answer: A

316) $\dfrac{65}{-91}$

    A) $-\dfrac{5}{7}$          B) $\dfrac{13}{7}$          C) $\dfrac{5}{7}$          D) $-\dfrac{13}{7}$

    Answer: A

317) $\dfrac{30}{-3}$

    A) $-300$          B) $10$          C) $-\dfrac{1}{10}$          D) $-10$

    Answer: D

318) $\dfrac{-14}{-1}$

   A) $\dfrac{1}{14}$            B) 14            C) –14            D) $-\dfrac{1}{14}$

Answer: B

319) $\dfrac{-24}{40}$

   A) $-\dfrac{8}{5}$            B) $\dfrac{3}{5}$            C) $\dfrac{8}{5}$            D) $-\dfrac{3}{5}$

Answer: D

320) $\dfrac{196}{-7}$

   A) $-\dfrac{1}{28}$            B) -28            C) -38            D) 28

Answer: B

321) $\dfrac{-168}{-8}$

   A) 21            B) 11            C) $\dfrac{1}{21}$            D) -21

Answer: A

322) $\dfrac{-55}{-90}$

   A) $\dfrac{11}{18}$            B) $-\dfrac{5}{18}$            C) $-\dfrac{11}{18}$            D) $\dfrac{5}{18}$

Answer: A

**Perform the indicated operation.**

323) $\dfrac{1}{-5} + \left(\dfrac{-1}{25}\right)$

   A) $-\dfrac{2}{25}$            B) $-\dfrac{6}{25}$            C) $-\dfrac{31}{125}$            D) $-\dfrac{1}{15}$

Answer: B

324) $\dfrac{3}{4} - \left(\dfrac{3}{-16}\right)$

   A) $-\dfrac{3}{8}$            B) $\dfrac{15}{16}$            C) $\dfrac{3}{8}$            D) $-\dfrac{15}{16}$

Answer: B

325) $\frac{6}{7} + \left(\frac{2}{-4}\right)$

   A) $\frac{4}{7}$        B) $\frac{5}{14}$        C) $\frac{1}{7}$        D) $\frac{10}{7}$

   Answer: B

326) $\frac{6}{-9} - \left(\frac{-1}{7}\right)$

   A) $-\frac{11}{21}$        B) $-\frac{5}{9}$        C) $\frac{11}{21}$        D) $\frac{11}{3}$

   Answer: A

327) $\frac{1}{10} - \left(\frac{-2}{15}\right)$

   A) $\frac{1}{6}$        B) $\frac{7}{30}$        C) $-\frac{1}{6}$        D) $-\frac{7}{30}$

   Answer: B

328) $\frac{1}{-15} + \left(\frac{3}{-10}\right)$

   A) $\frac{11}{30}$        B) $-\frac{11}{30}$        C) $\frac{1}{6}$        D) $-\frac{1}{6}$

   Answer: B

**Use a calculator to perform the indicated operation. Round the result to two decimal places.**

329) $950.642 \div (-63.34)$

   A) 0.07        B) -0.07        C) -15.01        D) 15.01

   Answer: C

330) $-\frac{25}{56}\left(-\frac{341}{712}\right)$

   A) -4.68        B) -0.21        C) 4.68        D) 0.21

   Answer: D

**Evaluate the expression for the given value or values.**

331) $6x$, for $x = -5$

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

   Answer: B

332) $-9x$, for $x = -7$

   A) 63        B) $\frac{9}{7}$        C) $-\frac{9}{7}$        D) $-63$

   Answer: A

333) xy, for x = –8, y = –7

    A) $\frac{7}{8}$             B) 56             C) –56             D) 15

    Answer: B

334) xy, for x = –5, y = 9

    A) 45             B) $\frac{9}{5}$             C) –45             D) $-\frac{9}{5}$

    Answer: C

335) –xy  for x =  8, y = –55

    A) –440             B) 413             C) –413             D) 440

    Answer: D

336) –xy  for x =  5, y = 93

    A) 458             B) 465             C) –465             D) –458

    Answer: C

337) –xy  for x = – 5, y = –19

    A) 64             B) –64             C) 95             D) –95

    Answer: D

338) $\frac{y}{z}$, for y = -30, z = 5

    A) 5             B) -5             C) -6             D) 6

    Answer: C

339) $\frac{z}{y}$, for y = -16, z = 8

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

    Answer: C

340) $\frac{z}{y}$, for y = -18, z = –9

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

    Answer: B

341) $-\frac{y}{z}$, for y = -18, z = 6

    A) -6             B) -3             C) 6             D) 3

    Answer: D

342) $-\frac{y}{z}$, for y = -35, z = –7

    A) 7             B) 5             C) -5             D) -7

    Answer: C

343) $\dfrac{x}{y}$ for x = 364, y = –7

    A) –52                 B) 52                 C) 55                 D) –55

    Answer: A

344) $-\dfrac{x}{y}$ for x = –324, y = 6

    A) –54                 B) –57                C) 54                 D) 57

    Answer: C

345) $\dfrac{y}{x}$ for x = 220, y = –4

    A) 55                  B) –55               C) $\dfrac{1}{55}$           D) $-\dfrac{1}{55}$

    Answer: D

346) $\dfrac{y}{x}$ for x = –280, y = –5

    A) $-\dfrac{1}{56}$          B) 56                C) –56              D) $\dfrac{1}{56}$

    Answer: D

347) $-\dfrac{y}{x}$ for x = –450, y = –9

    A) $-\dfrac{1}{50}$          B) –50              C) $\dfrac{1}{50}$          D) 50

    Answer: A

348) $\dfrac{x}{y}$ for x = –255, y = 0

    A) 255                B) –255            C) 0                 D) undefined

    Answer: D

349) $\dfrac{y}{x}$ for x = –228, y = 0

    A) 0                  B) 228               C) –228            D) undefined

    Answer: A

350) $-\dfrac{y}{x}$ for x = –250, y = 0

    A) –250              B) 250               C) 0                 D) undefined

    Answer: C

**Let x be a number. Translate the English phrase or sentence into a mathematical expression.**

    351) –4 times a number

        A) –4x                B) 4x                C) –4 ÷ x         D) –4 + x

        Answer: A

352) The product of –5 and a number

    A) 5x                 B) –5x               C) $\dfrac{x}{-5}$            D) $\dfrac{-5}{x}$

    Answer: B

353) A number divided by –75

    A) x – 75           B) –75 ÷ x         C) x ÷ (–75)       D) –75x

    Answer: C

354) The quotient of –80 and a number

    A) $\dfrac{-80}{x}$         B) 80 – x         C) $\dfrac{x}{-80}$         D) x – 80

    Answer: A

355) Five divided by a number

    A) –5x           B) x ÷ (–5)        C) 5 – x         D) 5 ÷ x

    Answer: D

**Write the ratio as a fraction.**

356) the ratio of 6 to 15

    A) $\dfrac{6}{5}$          B) $\dfrac{2}{5}$          C) $\dfrac{2}{15}$         D) $\dfrac{6}{2}$

    Answer: B

357) the ratio of 28 to 76

    A) $\dfrac{7}{19}$         B) $\dfrac{28}{19}$        C) $\dfrac{19}{76}$        D) $\dfrac{7}{76}$

    Answer: A

358) the ratio of 12 to 64

    A) $\dfrac{3}{64}$         B) $\dfrac{4}{64}$         C) $\dfrac{3}{16}$         D) 4

    Answer: C

**Solve the problem.**

359) A science experiment requires 493 milliliters of substance X and 14.5 milliliters of substance Y. Find the unit ratio of substance X to substance Y. What does your result mean in this situation?

    A) $\dfrac{34.5}{1}$; For every ml of substance Y used, 34.5 ml of substance X must be used.

    B) $\dfrac{34}{1}$; For every ml of substance Y used, 34 ml of substance X must be used.

    C) $\dfrac{1}{34}$; For every ml of substance X used, 34 ml of substance Y must be used.

    D) $\dfrac{1}{33.5}$; For every ml of substance X used, 33.5 ml of substance Y must be used.

    Answer: B

360) There were 883 billionaires in a certain country this year and 81 billionaires in this same country two years ago. Find the unit ratio of the number of billionaires this year to the number from two years ago. What does your result mean in this situation?

A) $\frac{10.5}{1}$; The number of billionaires this year was 10.5 times greater than two years ago.

B) $\frac{0.1}{1}$; The number of billionaires this year was 0.1 times greater than two years ago.

C) $\frac{11.6}{1}$; The number of billionaires this year was 11.6 times greater than two years ago.

D) $\frac{10.9}{1}$; The number of billionaires this year was 10.9 times greater than two years ago.

Answer: D

361) A person has credit card balances of –4245 dollars on a Store A account and –50 dollars on a Store B account. Find the unit ratio of the Store A account to the Store B account. If the person wishes to pay off both accounts gradually in the same amount of time, describe how the unit ratio can help guide the person in making his next payment.

A) $\frac{84.95}{1}$; For each $1 he pays to his Store B account, he should pay $84.95 to his Store A account.

B) $\frac{84.90}{1}$; For each $1 he pays to his Store B account, he should pay $84.90 to his Store A account.

C) $\frac{790}{1}$; For each $1 he pays to his Store B account, he should pay $790 to his Store A account.

D) $\frac{88.30}{1}$; For each $1 he pays to his Store B account, he should pay $88.30 to his Store A account.

Answer: B

362) The average number of viewers per day for TV Show A is 2.0 million viewers while the average number of viewers per day for TV Show B is 27.0 million viewers. Find the unit ratio of the average number of viewers per day of TV Show B to the average number of viewers per day of TV Show A. What does your result mean in this situation?

A) $\frac{13.5}{1}$; For every viewer watching TV Show A, there are about 13.5 viewers watching TV Show B.

B) $\frac{13.6}{1}$; For every viewer watching TV Show A, there are about 13.6 viewers watching TV Show B.

C) $\frac{27.5}{1}$; For every viewer watching TV Show A, there are about 27.5 viewers watching TV Show B.

D) $\frac{2.25}{1}$; For every viewer watching TV Show A, there are about 2.25 viewers watching TV Show B.

Answer: A

363) The populations and land areas are shown in the table for various regions:

| Populations and Land Areas | | |
|---|---|---|
| Region | Population | Land Area (square miles) |
| Region K | 567,968 | 496,110 |
| Region L | 21,382,732 | 328,415 |
| Region M | 5,519,103 | 18,879 |
| Region N | 8,999,094 | 9886 |
| Region O | 18,457,611 | 67,201 |

(i) The unit ratio of population to land area is called the *population density*. Find the population density of each region listed in the table.
(ii) Which region listed in the table has the greatest population density?
(iii) Which region listed in the table has the least population density?

A) (i) Region K: $\dfrac{2290 \text{ people}}{\text{square mile}}$; Region L: $\dfrac{130 \text{ people}}{\text{square mile}}$; Region M: $\dfrac{789 \text{ people}}{\text{square mile}}$;

Region N: $\dfrac{910 \text{ people}}{\text{square mile}}$; Region O: $\dfrac{549 \text{ people}}{\text{square mile}}$

(ii) Region K has the greatest population density.
(iii) Region L has the least population density.

B) (i) Region K: $\dfrac{2 \text{ people}}{\text{square mile}}$; Region L: $\dfrac{65 \text{ people}}{\text{square mile}}$; Region M: $\dfrac{439 \text{ people}}{\text{square mile}}$;

Region N: $\dfrac{910 \text{ people}}{\text{square mile}}$; Region O: $\dfrac{2747 \text{ people}}{\text{square mile}}$

(ii) Region O has the greatest population density.
(iii) Region K has the least population density.

C) (i) Region K: $\dfrac{572 \text{ people}}{\text{square mile}}$; Region L: $\dfrac{1628 \text{ people}}{\text{square mile}}$; Region M: $\dfrac{292 \text{ people}}{\text{square mile}}$;

Region N: $\dfrac{455 \text{ people}}{\text{square mile}}$; Region O: $\dfrac{275 \text{ people}}{\text{square mile}}$

(ii) Region L has the greatest population density.
(iii) Region K has the least population density.

D) (i) Region K: $\dfrac{1 \text{ person}}{\text{square mile}}$; Region L: $\dfrac{65 \text{ people}}{\text{square mile}}$; Region M: $\dfrac{292 \text{ people}}{\text{square mile}}$;

Region N: $\dfrac{910 \text{ people}}{\text{square mile}}$; Region O: $\dfrac{275 \text{ people}}{\text{square mile}}$

(ii) Region N has the greatest population density.
(iii) Region K has the least population density.

Answer: D

364) A person has a zero balance on a credit card. The person uses the credit card to buy 2 DVDs at a cost of $11.99 per DVD. What is the new balance?
   A) 23.98 dollars           B) -11.99 dollars           C) -23.98 dollars           D) -13.99 dollars

Answer: C

**Perform the exponentiation.**

365)  $1^9$

    A) 1          B) 9          C) 1.11111111          D) $\frac{1}{9}$

Answer:  A

366)  $9^1$

    A) 1          B) 1.11111111          C) $\frac{1}{9}$          D) 9

Answer:  D

367) $(-1)^{11}$

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

Answer:  B

368) $6^2$

    A) 36          B) 37          C) 12          D) 13

Answer:  A

369) $(-5)^2$

    A) 10          B) 25          C) –25          D) –10

Answer:  B

370) $(-5)^3$

    A) 15          B) -15          C) -125          D) 125

Answer:  C

371) $-5^3$

    A) 125          B) –15          C) –125          D) 15

Answer:  C

372)  $7^3$

    A) 21          B) 216          C) 343          D) 2187

Answer:  C

373)  $7^4$

    A) 28          B) 343          C) 2401          D) 16,384

Answer:  C

374) $(-2)^4$

    A) 16          B) 4          C) –16          D) –4

Answer:  A

375)  $8^5$

    A) 262,144          B) 32,768          C) 40          D) 390,625

Answer:  B

376) $\left(\dfrac{4}{7}\right)^2$

    A) $\dfrac{16}{49}$         B) 2.57142857         C) $\dfrac{49}{16}$         D) $\dfrac{16}{7}$

    Answer: A

377) $\left(\dfrac{1}{6}\right)^2$

    A) $\dfrac{1}{36}$         B) $\dfrac{1}{3}$         C) $\dfrac{1}{8}$         D) $\dfrac{1}{12}$

    Answer: A

378) $\left(-\dfrac{7}{3}\right)^3$

    A) $-\dfrac{343}{3}$         B) $\dfrac{343}{27}$         C) $-\dfrac{343}{27}$         D) $\dfrac{49}{9}$

    Answer: C

379) $\left(-\dfrac{7}{3}\right)^2$

    A) $\dfrac{49}{9}$         B) $\dfrac{49}{3}$         C) $-\dfrac{49}{9}$         D) $-\dfrac{49}{3}$

    Answer: A

**Perform the indicated operations.**

380) $9 + 9 - 3$
    A) 81         B) 9         C) 15         D) 141

    Answer: C

381) $9 \cdot 8 - 2$
    A) 74         B) 70         C) 54         D) 144

    Answer: B

382) $19 \cdot 2 \div 5$
    A) 190         B) 7.60         C) 26         D) 33

    Answer: B

383) $-4 \cdot 4 + 10$
    A) -56         B) 24         C) -26         D) -6

    Answer: D

384) $240 \div 6 - 2$
    A) 60         B) 236         C) 232         D) 38

    Answer: D

385) $17 + 23 \cdot 13$
    A) 404         B) 520         C) 53         D) 316

    Answer: D

386) -14 + 40 ÷ (-4)

    A) -24          B) 24          C) 6          D) -6

Answer: A

387) $\dfrac{7 + 3}{1 + 7}$

    A) $-\dfrac{5}{3}$          B) $\dfrac{1}{2}$          C) $-\dfrac{2}{3}$          D) $\dfrac{5}{4}$

Answer: D

388) $\dfrac{8 - 6}{6 - 8}$

    A) $-\dfrac{4}{3}$          B) –1          C) 2          D) $\dfrac{4}{3}$

Answer: B

389) $2 \cdot 4 + 14 \cdot 13$

    A) 286          B) 190          C) 372          D) 468

Answer: B

390) $25 + 25 \cdot 14 - 15$

    A) -50          B) 49          C) 685          D) 360

Answer: D

391) $-8(7) - (-17) \cdot 3$

    A) -107          B) 5          C) –5          D) 13

Answer: C

392) $27 + 20 \cdot 7 - (-12)$

    A) 341          B) 155          C) 66          D) 179

Answer: D

393) $15 + (-13)(-27) + (-13)$

    A) 42          B) 743          C) 392          D) 353

Answer: D

394) $95 - 7 \cdot 12 + 342 \div (-18)$

    A) -8          B) -25          C) -1731          D) 1037

Answer: A

395) $98 - 14 \cdot 3 + 154 \div 11$

    A) 22          B) 1199          C) 70          D) 266

Answer: C

396) $\dfrac{4(8)+3}{1-6(4)}$

    A) $-\dfrac{44}{23}$      B) $-\dfrac{35}{23}$      C) $-\dfrac{7}{4}$      D) $\dfrac{35}{23}$

    Answer: B

397) $20 \div 4(4-1)$

    A) 320      B) 8      C) 15      D) 3

    Answer: C

398) $100 \div (10 \div 2)$

    A) 95      B) 5      C) 10      D) 20

    Answer: D

399) $2 \cdot 3 + 4(10+7) + 7$

    A) 102      B) 60      C) 81      D) 245

    Answer: C

400) $240 \div 8 - (1+2)$

    A) 27      B) 29      C) 48      D) 31

    Answer: A

401) $12 \div 2 \cdot (12-7)$

    A) 114      B) 65      C) 79      D) 30

    Answer: D

402) $-11 + (5 \cdot 2 + 20) \div 5$

    A) -5      B) 5      C) 1      D) 3

    Answer: A

403) $12 \cdot 11 - (11-8) \div 3 - (8-6)$

    A) 41      B) 35      C) 117      D) 129

    Answer: D

404) $10^2 - 3 \cdot 4$

    A) 88      B) 280      C) 388      D) 196

    Answer: A

405) $(3+2)^2$

    A) 11      B) 13      C) 25      D) 7

    Answer: C

406) $2^4 + 12^2$

    A) 152      B) 40      C) 160      D) 32

    Answer: C

407) $5^5 - 3^4$

    A) 3061             B) 13             C) 3044             D) 3206

    Answer: C

408) $2^3 - (-12)^2$

    A) 30             B) 152             C) –136             D) -138

    Answer: C

409) $2^2 - (-4)^3$

    A) –60             B) 16             C) 68             D) 85

    Answer: C

410) $(-8)^2 - (-2)^3$

    A) -72             B) 72             C) -56             D) 56

    Answer: B

411) $13 + 2^2 \cdot 11 - (-19)$

    A) 45             B) 206             C) 16             D) 76

    Answer: D

412) $7^2 - 2(4) + 30 \div 5$

    A) $\dfrac{71}{5}$             B) 106             C) 7             D) 47

    Answer: D

413) $8 + 11^2 - (-3) \cdot 9$

    A) 1134             B) 297             C) 156             D) 102

    Answer: C

414) $(11 - 10)^2 + (4 + 5)^2$

    A) 82             B) 62             C) 42             D) 100

    Answer: A

415) $5^3 - 3^2 + 3^3 - 5^2$

    A) -118             B) 118             C) 82             D) -82

    Answer: B

416) $4 \cdot (4 + 5)^2 - 2 \cdot (6 - 3)^2$

    A) 2898             B) 1260             C) 423             D) 306

    Answer: D

417) $12^2 + 11 \cdot 9 - (12 + 5 \cdot 2)$

    A) 1373             B) 221             C) 241             D) 209

    Answer: B

418) $\dfrac{83 + 7}{3^2 - 4}$

    A) 16          B) 27          C) 45          D) 18

    Answer: D

419) $\dfrac{32 \cdot (17 - 14) - 6}{3^2 - 3}$

    A) 16          B) 17          C) 15          D) 30

    Answer: C

420) $(-60) \div (-5) \cdot \left( -\dfrac{1}{6} \right)$

    A) -72          B) 2          C) $-\dfrac{1}{2}$          D) - 2

    Answer: D

421) $\dfrac{1}{7} + \dfrac{1}{2} \cdot \dfrac{1}{3}$

    A) $\dfrac{17}{14}$          B) $\dfrac{13}{35}$          C) $\dfrac{9}{35}$          D) $\dfrac{2}{35}$

    Answer: B

422) $-\dfrac{2}{25} + \dfrac{7}{20} \div \dfrac{1}{5}$

    A) $\dfrac{173}{50}$          B) $-\dfrac{183}{100}$          C) $\dfrac{167}{100}$          D) $\dfrac{167}{200}$

    Answer: C

423) $-\dfrac{1}{15} + \dfrac{5}{12} \div \dfrac{1}{3}$

    A) $\dfrac{71}{120}$          B) $\dfrac{71}{60}$          C) $-\dfrac{79}{60}$          D) $\dfrac{37}{15}$

    Answer: B

424) $\dfrac{6}{5} \cdot \dfrac{2}{7} + \dfrac{5}{6} \cdot \dfrac{2}{5}$

    A) $\dfrac{71}{55}$          B) $\dfrac{13}{21}$          C) $\dfrac{71}{80}$          D) $\dfrac{71}{105}$

    Answer: D

425) $\dfrac{1}{4} + \dfrac{1}{5} \div \left( -\dfrac{2}{5} \right) \cdot \dfrac{1}{6}$

    A) $\dfrac{1}{6}$          B) $-\dfrac{3}{16}$          C) $-\dfrac{27}{4}$          D) $-\dfrac{11}{4}$

    Answer: A

426) $\frac{1}{6} \div \frac{5}{6} - 10 \cdot \left(\frac{1}{2}\right)^2$

    A) $-\frac{124}{5}$      B) $-\frac{23}{12}$      C) $-\frac{49}{20}$      D) $-\frac{23}{10}$

    Answer: D

427) $72 - 14 \cdot 2 + 300 \cdot \left(-\frac{1}{20}\right)$

    A) -876      B) -18      C) 29      D) 101

    Answer: C

**Use a calculator to perform the indicated operation.**

428) $14.56 + 50.5(23.9) - 3.65 \div 1.98$ (round to two decimal places)

    A) 615.08      B) -1190.55      C) 1553.09      D) 1219.67

    Answer: D

429) $\frac{(32.76)(-9.52) + 45.7}{73.21 - 22.83}$ (round to two decimal places)

    A) 23.53      B) -26.47      C) -3.72      D) -5.28

    Answer: D

430) $16.4 \div 0.4(0.3) + (1.7)^2$

    A) 16.69      B) 12.79      C) 15.19      D) 19.59

    Answer: C

**Evaluate the expression for the given value or values.**

431) $3x + 8$ for $x = 4$

    A) 11      B) 24      C) 20      D) 4

    Answer: C

432) $-6x^2$ for $x = 2$

    A) 144      B) -24      C) 24      D) -144

    Answer: B

433) $(-6x)^2$ for $x = 4$

    A) 96      B) 576      C) -96      D) -576

    Answer: B

434) $x^2 - 81$ for $x = -1$

    A) 80      B) -80      C) -9      D) -81

    Answer: B

435) $3x^2 + 6x$ for $x = 4$

    A) 36      B) 48      C) 72      D) 24

    Answer: C

436) $-7x^2 - 2x + 4$   for x = -2

    A) -20            B) -24            C) 22            D) -30

    Answer: A

437) $-2x^2 + 6x - 2$   for x = -1

    A) -6            B) 6            C) 2            D) -10

    Answer: D

438) $\dfrac{a + 7}{a + 6}$   for a = -1

    A) $\dfrac{5}{6}$            B) $\dfrac{6}{5}$            C) $\dfrac{8}{7}$            D) $\dfrac{7}{8}$

    Answer: B

439) $\dfrac{a - 7}{3a - 6}$   for a = -5

    A) $\dfrac{7}{3}$            B) $\dfrac{4}{7}$            C) 4            D) $\dfrac{7}{4}$

    Answer: B

440) $\dfrac{a^2}{1 - a^2}$   for a = 7

    A) $\dfrac{49}{48}$            B) $-\dfrac{48}{49}$            C) $\dfrac{49}{50}$            D) $-\dfrac{49}{48}$

    Answer: D

441) $2x + 4y$   for x = 3, y = 5

    A) 26            B) 22            C) 6            D) 10

    Answer: A

442) $8x - 3y$   for x = 5, y = 5

    A) 55            B) 25            C) 35            D) 37

    Answer: B

443) $\dfrac{2x}{y}$   for x = 27, y = 3

    A) 36            B) 48            C) 6            D) 18

    Answer: D

444) $\dfrac{x + y}{8}$   for x = 40, y = 64

    A) 69            B) 48            C) 104            D) 13

    Answer: D

445) $x^3 - 4y$   for x = 8, y = 2

    A) 520            B) 504            C) 16            D) 32

    Answer: B

446) $3x^2 + 5y$   for $x = 4, y = 2$
    A) 58                B) 126                C) 154                D) 32

Answer: A

447) $a^2 - (-b)^2$   for $a = 4, b = 3$
    A) 7                B) 24                C) 14                D) 25

Answer: A

448) $x - y + z$   for $x = 25, y = 8, z = 2$
    A) 15                B) 19                C) 35                D) 20

Answer: B

449) $x - 4yz$   for $x = 94, y = 5, z = 2$
    A) 54                B) 148                C) 900                D) 83

Answer: A

450) $a \cdot b \div c$   for $a = 18, b = 8, c = 9$
    A) 16                B) 1296                C) 135                D) 35

Answer: A

451) $a^2 - b \cdot c$   for $a = 8, b = 5, c = 2$
    A) 54                B) 48                C) 118                D) 18

Answer: A

452) $\dfrac{a + b}{c + d}$   for $a = 4, b = 8, c = 2, d = 6$

    A) - 3                B) $-\dfrac{1}{2}$                C) 1                D) $\dfrac{3}{2}$

Answer: D

453) $\dfrac{a + b}{c^2 - d}$   for $a = 203, b = 7, c = 3, d = 4$
    A) 40                B) 63                C) 42                D) 105

Answer: C

**Let x be a number. Translate the English phrase or sentence into a mathematical expression.**

454) –6 decreased by 4 times a number
    A) 4 – 6x                B) –6 – 4x                C) –6x – 4                D) 4x – 6

Answer: B

455) 5 less than –8 times a number
    A) –8x – 5                B) 5 – 8x                C) –8 – 5x                D) 5x – 8

Answer: A

456) 5 more than 8 times a number
    A) 13x                B) 8(5 + x)                C) 5x + 8                D) 8x + 5

Answer: D

**Solve the problem.**

457) In Country X, teacher pay in 1980 was $20.4 thousand and has increased by approximately $7 thousand per year since then.
(i) Complete the table below to help find an expression that stands for the teacher pay (in thousands of dollars) at t years since 1980. Show the arithmetic to help you see a pattern.
(ii) Evaluate the expression that you found in part (i) for t = 34. What does your result mean in this situation?

Numbers of Years and Teacher Pay

| Years Since 1980 | Teacher Pay (thousands of dollars) |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| t | |

A) (i)

Numbers of Years and Teacher Pay

| Years Since 1980 | Teacher Pay (thousands of dollars) |
|---|---|
| 0 | 7 – 0 + 20.4 |
| 1 | 7 – 1 + 20.4 |
| 2 | 7 – 2 + 20.4 |
| 3 | 7 – 3 + 20.4 |
| 4 | 7 – 4 + 20.4 |
| t | 7 – t + 20.4 |

(ii) -6.6; Teacher pay will be about -$6.6 thousand in 2014.

B) (i)

Numbers of Years and Teacher Pay

| Years Since 1980 | Teacher Pay (thousands of dollars) |
|---|---|
| 0 | -7 · 0 + 20.4 |
| 1 | -7 · 1 + 20.4 |
| 2 | -7 · 2 + 20.4 |
| 3 | -7 · 3 + 20.4 |
| 4 | -7 · 4 + 20.4 |
| t | -7t + 20.4 |

(ii) -217.6; Teacher pay will be about -$217.6 thousand in 2014.

C) (i)

Numbers of Years and Teacher Pay

| Years Since 1980 | Teacher Pay (thousands of dollars) |
|---|---|
| 0 | 7 · 0 + 20.4 |
| 1 | 7 · 1 + 20.4 |
| 2 | 7 · 2 + 20.4 |
| 3 | 7 · 3 + 20.4 |
| 4 | 7 · 4 + 20.4 |
| t | 7t + 20.4 |

(ii) 258.4; Teacher pay will be about $258.4 thousand in 2014.

D) (i)

| Numbers of Years and Teacher Pay | |
| --- | --- |
| Years Since 1980 | Teacher Pay (thousands of dollars) |
| 0 | 7 + 0 + 20.4 |
| 1 | 7 + 1 + 20.4 |
| 2 | 7 + 2 + 20.4 |
| 3 | 7 + 3 + 20.4 |
| 4 | 7 + 4 + 20.4 |
| t | 7 + t + 20.4 |

(ii) 61.4; Teacher pay will be about $61.4 thousand in 2014.

Answer: C

458) The population of City A was about 431 thousand in 1992 and has decreased by about 2 thousand per year since then.
(i) Complete the table below to help find an expression that stands for the population of City A (in thousands) at t years since 1992. Show the arithmetic to help you see a pattern.
(ii) Evaluate the expression that you found in part (i) for t = 31. What does your result mean in this situation?

| Population of City A | |
| --- | --- |
| Years Since 1992 | Population (thousands) |
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| t | |

A) (i)

| Population of City A | |
| --- | --- |
| Years Since 1992 | Population (thousands) |
| 0 | 2 · 0 + 431 |
| 1 | 2 · 1 + 431 |
| 2 | 2 · 2 + 431 |
| 3 | 2 · 2 + 431 |
| 4 | 2 · 2 + 431 |
| t | 2t + 431 |

(ii) 493; The population of City A will be about 493 thousand in 2023.

B) (i)

| Population of City A | |
|---|---|
| Years Since 1992 | Population (thousands) |
| 0 | 2 – 0 + 431 |
| 1 | 2 – 1 + 431 |
| 2 | 2 – 2 + 431 |
| 3 | 2 – 2 + 431 |
| 4 | 2 – 2 + 431 |
| t | 2 – t + 431 |

(ii) 398; The population of City A will be about 398 thousand in 2023.

C) (i)

| Population of City A | |
|---|---|
| Years Since 1992 | Population (thousands) |
| 0 | -2 + 0 + 431 |
| 1 | -2 + 1 + 431 |
| 2 | -2 + 2 + 431 |
| 3 | -2 + 2 + 431 |
| 4 | -2 + 2 + 431 |
| t | -2 + t + 431 |

(ii) 460; The population of City A will be about 460 thousand in 2023.

D) (i)

| Population of City A | |
|---|---|
| Years Since 1992 | Population (thousands) |
| 0 | -2 · 0 + 431 |
| 1 | -2 · 1 + 431 |
| 2 | -2 · 2 + 431 |
| 3 | -2 · 2 + 431 |
| 4 | -2 · 2 + 431 |
| t | -2t + 431 |

(ii) 369; The population of City A will be about 369 thousand in 2023.

Answer: D

459) If a cube has sides of length s yards, then the volume of the cube is $s^3$ cubic yards. Find the volume of a cubic box with sides of length 21 yards.

   A) 63 cubic yards        B) 882 cubic yards        C) 441 cubic yards        D) 9261 cubic yards

Answer: D

460) If the radius of a sphere is r feet, then the volume of the sphere is $\frac{4}{3}\pi r^3$ cubic feet. Find the volume of a sphere with radius of 9 feet. Round your answer to two decimal places.

   A) 309.39 cubic feet        B) 9160.91 cubic feet        C) 3053.64 cubic feet        D) 1526.82 cubic feet

Answer: C

461) The normal gasoline mileage of a car is 24 mpg. On a smooth road, its mileage is 12% higher. What is its mileage on a smooth road? Round your answer to the nearest tenth.
   A) 2.9 mpg          B) 26.9 mpg          C) 50 mpg          D) 24 mpg

   Answer: B

462) The regular price of a bathing suit is $44. The price is decreased 30% for a sale in July. What is the sale price of the suit?
   A) $30.80          B) $13.20          C) $29.80          D) $31.80

   Answer: A

463) A computer printer costs $200. The price is increased by $6\frac{1}{2}$% for sales tax. What is the total price of the printer with tax?
   A) $330.00          B) $215.00          C) $213.00          D) $211.00

   Answer: C

464) Brand X copier has improved its copier so that it produces 24% more copies than its old model. If the old model ran 475 copies per hour, how many copies would the new model run? Round your answer to the nearest whole number.
   A) 589 copies per hour                    B) 574 copies per hour
   C) 270 copies per hour                    D) 490 copies per hour

   Answer: A