Going into Int 2 Summer Packet

Name:_____

Date:_____

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1   A model is made of a car. The car is 9 feet long and the model is 6 inches long. What is the ratio of the length of the car to the length of the model?

    A   18 : 1
    B   1 : 18
    C   9 : 6
    D   6 : 9

2   The Sears Tower in Chicago is 1450 feet high. A model of the tower is 24 inches tall. What is the ratio of the height of the model to the height of the actual Sears Tower?

    A   1 : 725
    B   725 : 1
    C   12 : 725
    D   725 : 12

3   The length of a rectangle is $6\frac{1}{2}$ inches and the width is $3\frac{3}{4}$ inches. What is the ratio, using whole numbers, of the length to the width?

    A   26 : 15
    B   26 : 30
    C   15 : 26
    D   13 : 15

4    $\frac{a}{b} = \frac{5}{3}$,

    So, $3a =$ ____.

    A $3b$
    B $10b$
    C $5b$
    D $6b$

_____

5   $\dfrac{g}{h} = \dfrac{6}{5}$.

Which equation must be true?

A $5h = 6g$

B $\dfrac{h}{g} = \dfrac{5}{6}$

C $\dfrac{h}{6} = \dfrac{g}{5}$

D $gh = 6 \times 5$

6   $\dfrac{x + 3}{3} = \dfrac{y + 2}{2}$.

What is the value of:

$\dfrac{x}{3}$

A $y + 1$

B $\dfrac{y}{3}$

C $\dfrac{y}{2}$

D $y - 1$

7   Solve the proportion.

$\dfrac{6}{a} = \dfrac{18}{27}$

A   54

B   81

C   9

D   18

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8   Solve the proportion.

$\frac{5}{7} = \frac{m}{35}$

      A $\frac{1}{25}$

      B 5

      C 1

      D 25

9   Solve the proportion.

$\frac{3y - 8}{12} = \frac{y}{5}$

      A -10

      B -7

      C $\frac{3}{40}$

      D $\frac{40}{3}$

10   A map of Australia has a scale of 1 cm to 120 km. If the distance between Melbourne and Canberra is 463 km, how far apart are they on the map, to the nearest tenth of a centimeter?

      A 0.4 cm

      B 3.9 cm

      C 38.6 cm

      D 55,560 cm

11   On a blueprint, the scale indicates that 6 cm represent 15 feet. What is the length of a room that is 9 cm long and 4 cm wide on the blueprint?

      A 22.5 ft

      B 1.5 ft

      C 6 ft

      D 16.5 ft

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12   You want to produce a scale drawing of your living room, which is 24 ft by 15 ft. If you use a scale of 4 in. = 6 ft, what will be the dimensions of your scale drawing?

      A   24 in. by 144 in.
      B   16 in. by 10 in.
      C   24 in. by 10 in.
      D   16 in. by 144 in.

13   A model is built having a scale of 1 : 15,000. How high would a 35,600-ft mountain be in the model? Round to the nearest inch.

      A   28 in.
      B   5 in.
      C   0.4 in.
      D   607,200 in.

14   Simplify.
$-4x - 6x - 1 - 5$

      A $2x + 4$
      B $-10x + 4$
      C $-10x - 6$
      D $2x - 6$

15   Simplify.
$(2x + 2)(4x + 3)$

      A $8x^2 + 14x + 6$
      B $8x^2 - 2x - 6$
      C $8x^2 - 14x + 6$
      D $8x^2 + 2x - 6$

16   Simplify.
$(3m + 8)^2$

      A $9m^2 + 48m - 64$
      B $9m^2 + 24m - 64$
      C $9m^2 - 48m + 64$
      D $9m^2 + 48m + 64$

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17   Evaluate the expression for $x = 2$ and $y = -4$.

$-3x + 2y$

        A   −4
        B   −6
        C   −14
        D   14

18   Evaluate the expression for $x = 2$ and $y = -4$.

$(-x - y)^2$

        A   4
        B   36
        C   −4
        D   25

19   Evaluate the expression for $x = 2$ and $y = -4$.

$5xy$

        A   −40
        B   −20
        C   40
        D   10

20   Evaluate the expression for $x = 2$ and $y = -4$.

$$\frac{x^2 - y}{x + 5y - 1}$$

        A   0

        B $-\frac{6}{19}$

        C $-\frac{8}{19}$

        D $-\frac{8}{17}$

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21 Find the value of the variable.

$-3x - 8 = -2$

      A   −3
      B   2
      C   3
      D   −2

22 Solve the equation.

$56 - 13 + 5g = 78$

      A   7
      B   4
      C   9
      D   −7

23 Solve the equation.

$6(y + 6) = 90$

      A   21
      B   9
      C   10
      D   −21

24 Solve the equation.

$\frac{2p}{3} - 15 = -19$

      A   −19
      B   −51
      C   −6
      D   −1

_____

25 A customer went to a garden shop and bought some potting soil for $17.50 and 8 shrubs. The total bill was $109.50. Choose the equation that correctly models this situation. Then find the price of each shrub.

     A $8p + \$17.50 = \$109.50; p = \$11.50$
     B $8p + 17.5p = \$109.50; p = \$4.29$
     C $8p + \$17.50 = \$109.50; p = \$13.75$
     D $8(p + \$17.50) = \$109.50; p = \$8.50$

26 Solve the system of equations.

$$\begin{cases} -3x - 3y = 3 \\ 3x - y = 1 \end{cases}$$

     A $(-3, 1)$
     B $(1, -3)$
     C $(0, -1)$
     D $(-1, 0)$

27 Solve the system of equations.

$$\begin{cases} -5x - 5y = -5 \\ x - 5y = 7 \end{cases}$$

     A $(-1, 2)$
     B $(2, -1)$
     C $(-2, 1)$
     D $(1, -2)$

28 Solve the equation for the variable given.
Volume of a prism: $V = \ell w h; h$

     A $h = \dfrac{V}{\ell w}$

     B $h = V - \ell w$

     C $h = \dfrac{V}{hw}$

     D $h = V(\ell w)$

_____

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29   Solve the equation for the variable given.

Volume of a prism: $V = \ell wh$; ℓ

   A $\ell = \dfrac{Vw}{h}$

   B $\ell = V - wh$

   C $\ell = \dfrac{V}{wh}$

   D $\ell = V(wh)$

30   Solve the equation for the variable given.

Volume of a cylinder: $V = \pi r^2 h$; r

   A $r = \left(\dfrac{\pi r}{V}\right)^2$

   B $r = \sqrt{V - \pi h}$

   C $r = \left(\dfrac{V}{\pi h}\right)^2$

   D $r = \sqrt{\dfrac{V}{\pi h}}$

31   Based on the pattern, what are the next two terms of the sequence?

9, 15, 21, 27, . . .

   A   33, 972

   B   39, 45

   C   162, 972

   D   33, 39

32   Based on the pattern, what are the next two terms of the sequence?

$5, \dfrac{5}{3}, \dfrac{5}{9}, \dfrac{5}{27}, \dfrac{5}{81}, \ldots$

   A $\dfrac{5}{84}, \dfrac{5}{246}$

   B $\dfrac{5}{243}, \dfrac{5}{729}$

   C $\dfrac{5}{243}, \dfrac{5}{246}$

   D $\dfrac{5}{84}, \dfrac{5}{87}$

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33   Based on the pattern, what is the next figure in the sequence?

◧▽◧▽△⊘◧▽◧▽△⊘

A   △

B   ◧

C   ▽

D   ⊘

34   Based on the pattern, what conjecture can you make about the sum of the first 20 positive even numbers?

2	$=1 \cdot 2$
2 + 4	$=2 \cdot 3$
2 + 4 + 6	$=3 \cdot 4$
2 + 4 + 6 + 8	$=4 \cdot 5$
2 + 4 + 6 + 8 + 10	$=5 \cdot 6$

A   The sum is $20 \cdot 21$.

B   The sum is $19 \cdot 20$.

C   The sum is $21 \cdot 22$.

D   The sum is $20 \cdot 20$.

_____

35   According to the pattern, what conjecture can you make about the product of 13 and 8,888,888?

13 · 88	= 1,144
13 · 888	= 11,544
13 · 8,888	= 115,544
13 · 88,888	= 1,155,544

      A   115,555,544
      B   1,115,555,444
      C   1,155,555,544
      D   11,155,555,444

36   Choose a counterexample to show that the conjecture is false.
Conjecture: Any number that is divisible by 4 is also divisible by 8.

      A   24
      B   40
      C   12
      D   26

37   Choose a counterexample to show that the conjecture is false.
Conjecture: The product of two positive numbers is greater than the sum of the two numbers.

      A   3 and 5
      B   2 and 2
      C   A counterexample exists, but it is not shown above.
      D   There is no counterexample. The conjecture is true.

_____

38   Alfred is practicing typing. The first time he tested himself, he could type 23 words per minute. After practicing for a week, he could type 26 words per minute. After two weeks he could type 29 words per minute. Based on this pattern, predict how fast Alfred will be able to type after 4 weeks of practice.

      A   39 words per minute
      B   29 words per minute
      C   35 words per minute
      D   32 words per minute

39   May's Internet Services designs websites. May noticed an increase in her customers over a period of 5 consecutive weeks. Based on the pattern shown in the graph, what conjecture can you make about the number of customers May will have in the seventh week?
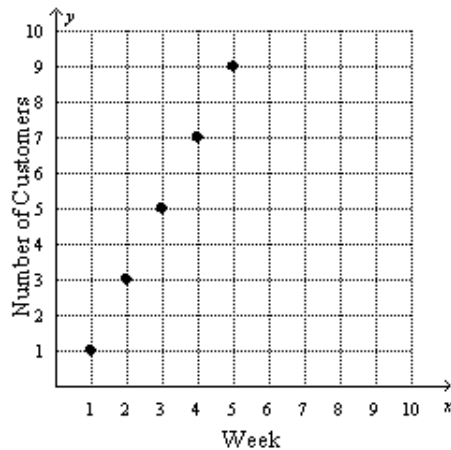
      A   May will have 7 customers.
      B   May will have 9 customers.
      C   May will have 11 customers.
      D   May will have 13 customers.

40   Find the perimeter of the rectangle. The drawing is not to scale.
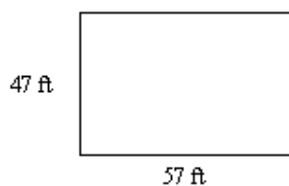
      A   151 feet
      B   208 feet
      C   161 feet
      D   104 feet

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41   Jose wants to put a fence around his rectangular garden. His garden measures 33 feet by 39 feet. The garden has a path around it that is 3 feet wide. How much fencing material does Jose need to enclose the garden and path?
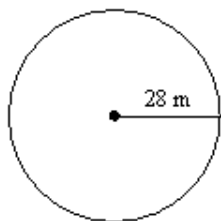
      A   120 ft
      B   156 ft
      C   168 ft
      D   84 ft

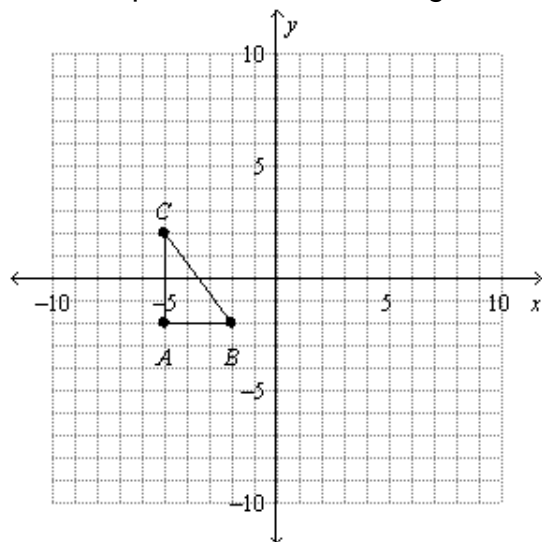42   Find the circumference of the circle in terms of π.
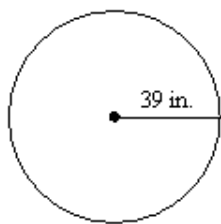
      A 156π in.
      B 39π in.
      C 1521π in.
      D 78π in.

43   Find the circumference of the circle to the nearest tenth. Use 3.14 for π.

      A   2461.8 m
      B   175.8 m
      C   87.9 m
      D   351.7 m

_____

44   Find the perimeter of the triangle with vertices $A(-5, -2)$, $B(-2, -2)$, and $C(-5, 2)$.

      A   12 units
      B   7 units
      C   32 units
      D   14 units

45   Ken is adding a ribbon border to the edge of his kite. Two sides of the kite measure 9.5 inches, while the other two sides measure 17.8 inches. How much ribbon does Ken need?

      A   45.1 in.
      B   27.3 in.
      C   54.6 in.
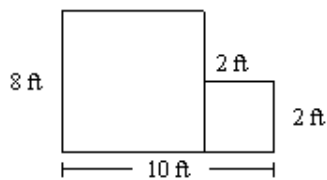   D   36.8 in.

46   Find the area of a rectangle with base 2 yd and height 5 ft.

      A 10 yd^2
      B 30 ft^2
      C 10 ft^2
      D 30 yd^2

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47   Find the area of the circle in terms of π.
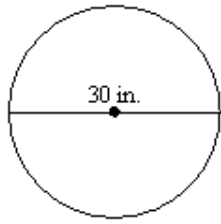
A 30π in.^{2}
B 900π in.^{2}
C 60π in.^{2}
D 225π in.^{2}

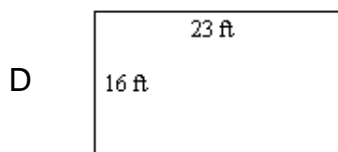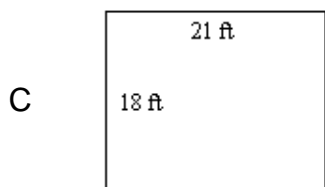48   The figure is formed from rectangles. Find the total area. The diagram is not to scale.
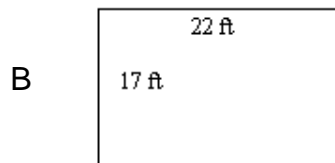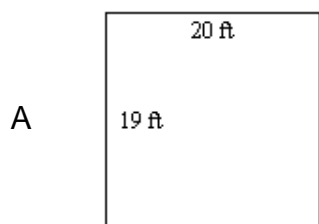

A   104 ft^2
B   36 ft^2
C   80 ft^2
D   68 ft^2

49   If the perimeter of a square is 72 inches, what is its area?

A   72 in.^{2}
B   324 in.^{2}
C   18 in.^{2}
D   5,184 in.^{2}

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50   Jennifer has 78 feet of fencing to make a rectangular vegetable garden. Which dimensions
   will give Jennifer the garden with the greatest area? The diagrams are not to scale.

A
```
        20 ft
    ┌──────────┐
    │          │
19 ft│         │
    │          │
    └──────────┘
```

B
```
        22 ft
    ┌──────────┐
17 ft│         │
    │          │
    └──────────┘
```

C
```
        21 ft
    ┌──────────┐
18 ft│         │
    │          │
    └──────────┘
```

D
```
        23 ft
    ┌──────────┐
16 ft│         │
    └──────────┘
```

51   Which expression models the area of the *shaded* region in the figure below? The diagram
     is not to scale.
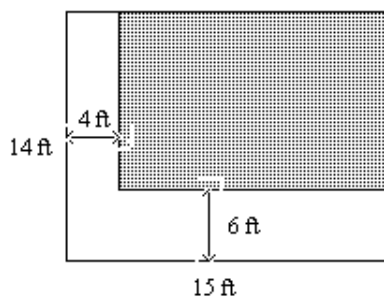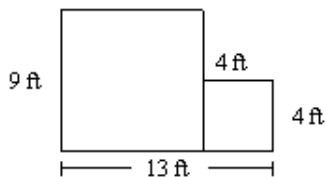

A $A = (15 - 4) \times (14 - 6)$
B $A = (15 - 6) \times (14 - 4)$
C $A = 14 \times 15 - (14 \times 4) - (15 \times 6)$
D $A = 14 \times 15 - 4 \times 6$

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52 Find, to the nearest tenth, the area of the region that is inside the square and outside the circle. The circle has diameter 14 inches.
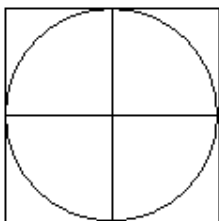
    A   42.1 $in.^2$

    B   10.5 $in.^2$

    C   153.9 $in.^2$

    D   196 $in.^2$

53 The figure is formed from rectangles. Find the total area. The diagram is not to scale.
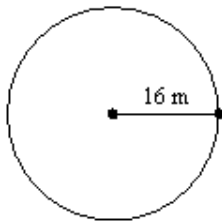

    A   44 ft^2

    B   185 ft^2

    C   97 ft^2

    D   117 ft^2

54 Bonnie, Jason, Melda, and Kenji form a chess club. Each of them wants to play one game with every other member of the club. How many games will be played?

    A   7 games

    B   6 games

    C   4 games

    D   16 games

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55   Two cars started from the same point. One traveled north at 55 mi/h and the other traveled west at 65 mi/h. How far apart were the cars after 3 hours? Round to the nearest tenth of a mile.

   A   255.4 mi
   B   19.0 mi
   C   85.1 mi
   D   360.0 mi

56   There are 73 pages in your journal. If you number all of the pages, starting with 1, how many digits will you have to write?

   A   73 digits
   B   146 digits
   C   137 digits
   D   75 digits

57
   Sasha returned home from mowing lawns at 4:15 P.M. It took $\frac{3}{4}$ h to mow the first lawn. The second lawn took 1 h. She took a 30-min break between the two lawns. When did Sasha begin mowing the first lawn?

   A   2:15 P.M.
   B   2:00 P.M.
   C   2:30 P.M.
   D   2:45 P.M.

58   You bake cookies for a school fundraiser. In the morning, you sell 12 cookies. During lunch, you sell one-half of the cookies you have left. In the afternoon, you sell 18 cookies. If you are left with 6 cookies at the end of the day, how many cookies did you start with?

   A   72 cookies
   B   54 cookies
   C   60 cookies
   D   78 cookies

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59   A square with side lengths of 6 cm circumscribes a circle. The area of the circle is 28.27 cm^2. Find the circumference of the circle.
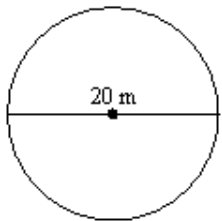
    A   9.42 cm
    B   18.85 cm
    C   2.36 cm
    D   169.65 cm

60   Find the area of the circle. Leave your answer in terms of π.

    A 8π m^2
    B 256π m^2
    C 512π m^2
    D 4096π m^2

61   Find the area of the circle. Leave your answer in terms of π.

    A 200π m^2
    B 400π m^2
    C 100π m^2
    D 43π m^2

62   Find the area of the circle. Leave your answer in terms of π.

$r = 10$ ft

    A 25π ft^2
    B 400π ft^2
    C 20π ft^2
    D 100π ft^2

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63 Marcus has 72 feet of fencing. If he wants to build a fenced-in rectangular area, which dimensions will have the largest area?

    A   18 ft by 18 ft
    B   22 ft by 14 ft
    C   20 ft by 16 ft
    D   20 ft by 22 ft
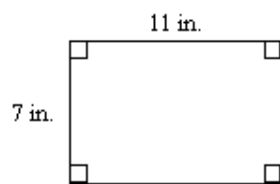
64 The lengths of the sides of the triangle are given to the nearest centimeter. Find the perimeter of the triangle.
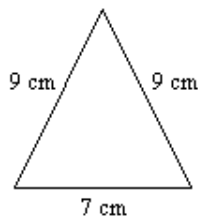
Drawing not to scale

    A   27 cm
    B   25 cm
    C   31.5 cm^2
    D   40.5 cm

65 Find the perimeter of the rectangle.

Drawing not to scale

    A   18 in.
    B   36 in.
    C   77 in.^{2}
    D   22 in.

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_____

66   Choose the value that correctly completes the statement.
     0.77 m = ? cm

          A   770
          B   0.077
          C   7.7
          D   77

67   Choose the value that correctly completes the statement.
     4087 mL = ? L

          A   408.7
          B   40.87
          C   4.087
          D   40,870

68   Choose the value that correctly completes the statement.
     24 pt = ? qt

          A   10
          B   50
          C   12
          D   48

69   Choose the value that correctly completes the statement.
     9 ft = ? in.

          A   90
          B   27
          C   36
          D   108

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70   Choose the value that correctly completes the statement.

468 in.^{2} = $\underline{\ ?\ }$ ft^2

      A $\frac{4}{13}$

      B $3\frac{1}{4}$

      C $19\frac{1}{2}$

      D   39

71   Choose the value that correctly completes the statement.

0.44 km^2 = $\underline{\ ?\ }$ m^2

      A   4.4
      B   440
      C   0.044
      D   440,000

72   Choose the value that correctly completes the statement.

340,000 cm^3 = $\underline{\ ?\ }$ m^3

      A   0.34
      B   3400
      C   3.4
      D   340

73   Simplify.

10^2

      A   −20
      B   100
      C   −100
      D   20

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74   Simplify.

$(-18)^2$

        A   −324
        B   324
        C   −36
        D   36

75   Simplify.

$(-7.8)^2$

        A   −6.084
        B   −60.84
        C   60.84
        D   608.4

76   Simplify.

$\left(\dfrac{8}{3}\right)^2$

        A $\dfrac{64}{2}$

        B $\dfrac{16}{4}$

        C $\dfrac{16}{2}$

        D $\dfrac{64}{9}$

77   Simplify.

$\sqrt{\dfrac{49}{16}}$

        A $\dfrac{7}{4}$

        B $\dfrac{25}{16}$

        C $\dfrac{7}{16}$

        D $\dfrac{25}{8}$

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78   Simplify. Round to the nearest tenth if necessary.

$\sqrt{225}$

       A   9
       B   63.8
       C   112.5
       D   15

79   Solve. Round to the nearest tenth if necessary.

$x^2 = 41$

       A ± 6.4
       B ± 9.4
       C ± 13.5
       D ± 20.5

80   Simplify. Round to the nearest tenth if necessary.

$11^2 + c^2 = 15^2$

       A ± 104
       B ± 6.1
       C ± 10.2
       D ± 2

81   Simplify.

$\sqrt{32}$

       A   8
       B   2
       C $4\sqrt{2}$
       D $8\sqrt{2}$

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82   Simplify.

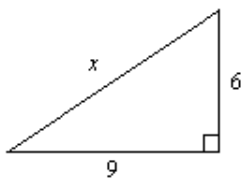$$\sqrt{\dfrac{5}{49}}$$

    A $\dfrac{\sqrt{5}}{25}$

    B $7\sqrt{5}$

    C $\dfrac{\sqrt{5}}{7}$

    D $\dfrac{5}{7}$

83   Simplify.
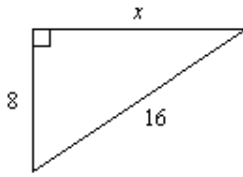
$$\dfrac{3}{\sqrt{11}}$$

    A $\dfrac{3\sqrt{11}}{11}$

    B $3\sqrt{11}$

    C $11\sqrt{3}$

    D $\dfrac{\sqrt{121}}{11}$

84   Find the value of *x*. Leave your answer in simplest radical form.

    A $13\sqrt{3}$

    B $3\sqrt{13}$

    C $3\sqrt{11}$

    D $3\sqrt{3}$

_____

85   Find the value of x in simplest radical form.

      A   8
      B $16\sqrt{3}$
      C $4\sqrt{3}$
      D $8\sqrt{3}$

86   Express the ratio in simplest form.
12 to 3

      A   1 to 4
      B   4 to 1
      C   2 to 3
      D   3 to 2

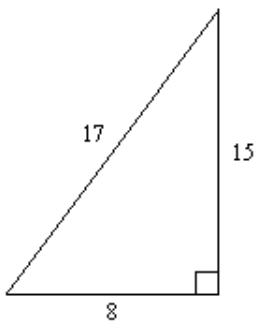87   Express the ratio in simplest form.

$$\frac{4w^2}{22w}$$

      A $\frac{2w}{11}$

      B $\frac{4w}{22}$

      C $\frac{2w^2}{11}$

      D $\frac{4}{22w}$

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88   Express the ratio in simplest form.

$$\frac{a + b}{4a + 4b}$$

   A $\dfrac{1}{3a + 3b}$

   B $\dfrac{1}{4}$

   C $\dfrac{1}{a + b}$

   D $\dfrac{1}{8}$

89   Express the ratio in simplest form.
   shorter leg : hypotenuse

Drawing not to scale

   A $\dfrac{8}{15}$

   B $1\dfrac{2}{15}$

   C $2\dfrac{1}{8}$

   D $\dfrac{8}{17}$

90   Convert the scale factor to a decimal.

$$\frac{26}{50}$$

   A   0.26
   B   1.3
   C   0.52
   D   0.24

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91 Convert the scale factor to a fraction.
0.4

    A $1\frac{2}{5}$

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

    C $\frac{1}{4}$

    D $\frac{2}{5}$

92 What is 91% of 70? Estimate the answer.

    A about 56
    B about 70
    C about 77
    D about 64

93 Choose the decimal equivalent of 73.1%.

    A 0.00731
    B 731
    C 7.31
    D 0.731

94 Simplify.
29% of 33

    A 10.05
    B 9.57
    C 8.13
    D 11.01