

1) If  $3x - 1 = 11$ , what is the value of  $x^2 + x$ ?

- 12
- 15
- 16
- 18
- 20

**Answer :: E**

**Explanation of Answer:**

$$3x - 1 = 11$$

$$3x = 11 + 1 = 12$$

$$x = 12 / 3 = 4$$

$$x^2 + x = 4^2 + 4 = 16 + 4 = 20$$

2) A bell rings every 2 hours, a second bell rings every 3 hours, and a third bell rings every 4 hours. If all 3 bells ring at 9:00 AM., at what time will all 3 bells next ring?

- noon
- 6:00 p.m.
- 9:00 p.m.
- 10:00 p.m.
- Not enough information is given.

**Answer :: C**

**Explanation of Answer:**

The easiest way to do this is by looking at the third bell that only rings every 4 hours. You can immediately find a solution by multiplying Bell 3 x Bell 2 =  $4 \times 3 = 12$ . Because 12 is also evenly divisible by 2, this is a solution, but you don't know if this is the best solution.

To verify it is the best alternative, you must look at each time the third bell rings and determine if it's evenly divisible by the other two. Therefore, you would look at 4, 8, and 12.

Because 12 is the only bell that is evenly divisible by Bells 1 and 2, you know the bells will all ring every 12 hours. 9:00 AM = 12 hours = 9:00 PM

3) A family spends 20% of its monthly income on food, 23% on rent, and 42% on other expenses and saves the balance. If the family saves \$360 per month, what is its monthly income?

- \$2,000
- \$2,200
- \$2,400
- \$2,500
- \$28,800

**Answer :: C**

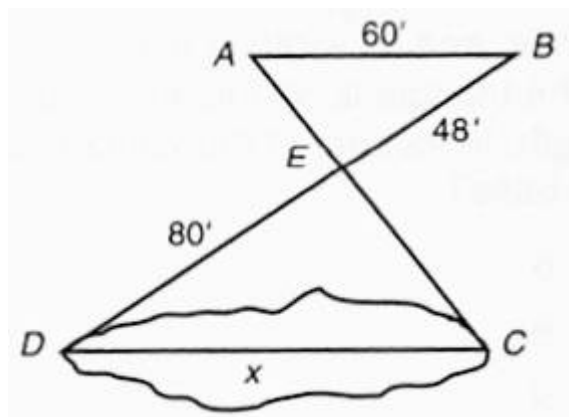
**Explanation of Answer:**

Expenditures:  $20\% + 23\% + 42\% = 85\%$

Savings:  $100\% - 85\% = 15\%$

Let  $x$  = family's monthly income. Then  $.15x = \$360$ , so  $x = \$360 / .15 = \$2,400$

4)



To measure the distance ( $DC$ ) across a pond, a surveyor takes points  $A$  and  $B$  so that  $AB$  is parallel to  $DC$ . If  $AB = 60$  feet,  $EB = 48$  feet, and  $ED = 80$  feet, find  $DC$ .

- 72 ft.
- 84 ft.
- 96 ft.
- 100 ft.
- Not enough information is given.

**Answer :: D**

**Explanation of Answer:**

Let  $x = DC$ .

Since  $\triangle ABE$  is similar to  $\triangle CED$ , the lengths of their corresponding sides are in proportion.

$$x / 60 = 80 / 48$$

$$48x = 80(60) = 4800$$

$$x = 4800 / 48 = 100 \text{ ft.}$$

5) How many 4-inch by 8-inch bricks are needed to build a walk 6 feet wide and 24 feet long?

- 54
- 600
- 648
- 840
- 1,000

**Answer :: C**

**Explanation of Answer:**

Width of walk is 6 ft., or  $6 \times 12 = 72$  in. Width of each brick is 4 in. Number of

bricks that can be fitted along the width is  $72 / 4 = 18$ .

Length of walk is 24 ft., or  $24 \times 12 = 288$  in. Length of each brick is 8 in. Number of bricks that can be fitted along the length is  $288 \div 8 = 36$ .

$$18 \times 36 = 648$$

6) Each of the numbers below is a solution of the inequality  $2x + 3 > 7$  **EXCEPT**

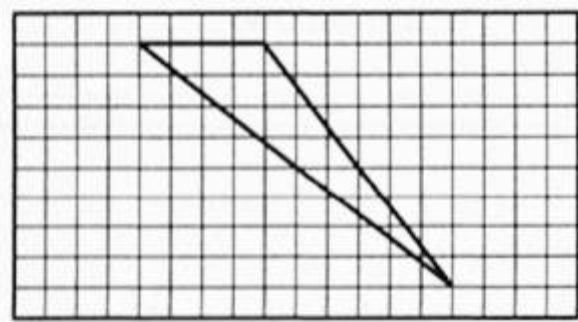
- 10
- 5
- 4
- 3
- 0

**Answer :: E**

**Explanation of Answer:**

Since  $2x + 3 > 7$ , then  $2x > 4$ . and  $x > 2$ . Of the choices listed, only 0 is not greater than 2.

7)



What is the area, in square graph units, of the triangle?

- 8
- 10
- 16
- 32

● 48

Answer :: C

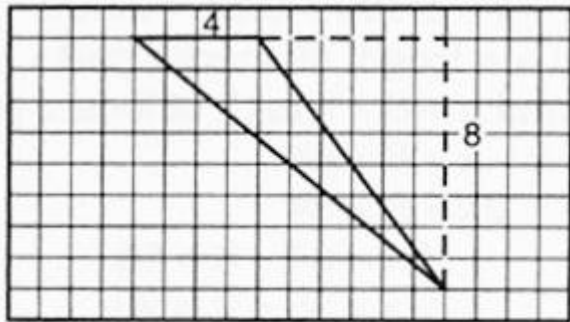
**Explanation of Answer:**

Use the formula for the area of a triangle:

$$A = 1/2 \text{ Base} \times \text{Height}$$

In this case, B = 4 and H = 8

$$\text{Area} = 1/2(4)(8) = 16$$



8) A room is 24 feet long, 18 feet wide, and 9 feet high. How many square yards of wallpaper are needed to paper the four walls of the room?

● 72

● 84

● 96

● 180

● 756

Answer :: B

**Explanation of Answer:**

Area of front wall =

$$9 \times 24 = 216 \text{ sq. ft.}$$

Area of back wall

$$9 \times 24 = 216 \text{ sq. ft.}$$

Area of side wall =

$$9 \times 18 = 162 \text{ sq. ft.}$$

Area of other side wall =

$$9 \times 18 = 162 \text{ sq. ft.}$$

Total area of walls =

$$216 + 216 + 162 + 162 = 756 \text{ sqft.}$$

$$756 / 9 = 84 \text{ sq. yd.}$$

9) The diameter of one bicycle wheel is 28 inches and its spokes run from the hub (or center) to the edge of the rim. The diameter of another bicycle wheel 21 inches. What is the difference in inches between the length of the spokes of the two wheels?

7

3.5

4.5

12

8

**Answer :: B**

**Explanation of Answer:**

The spoke is equivalent to the radius. which is the

diameter / 2

Therefore, the spoke for the 28-inch wheel is 14 inches.

The spoke for the 21-inch wheel is 10.5 Inches.

$14 - 10.5 = 3.5$ -inch difference between spokes.

10) After working 4 hours, Frank has made 21 machine parts. At the same rate, how many parts can he make in 7 hours?

- $7(21) / 4$
- $7(4) / 21$
- $7(21)$
- $4(21) / 7$
- $7(4)(21)$

**Answer :: A**

**Explanation of Answer:**

Let  $x$  = number of machine parts Frank can make in 7 hr.

Set up a proportion:

$$4 / 21 = 7 / x$$

$$4x = 7(21)$$

$$x = 7(21) / 4$$