

1. Which of the following could be the lengths of the sides of a right triangle?

A. $\begin{matrix} a & b & c \\ 5.1 \text{ cm, } & 3.4 \text{ cm, } & 8.5 \text{ cm} \end{matrix}$

B. $\begin{matrix} a & b & c \\ 5.1 \text{ cm, } & 6.8 \text{ cm, } & 8.5 \text{ cm} \end{matrix}$

~~C. $\begin{matrix} a & b & c \\ 5.1 \text{ cm, } & 8.5 \text{ cm, } & 8.5 \text{ cm} \end{matrix}$~~

D. $\begin{matrix} a & b & c \\ 5.1 \text{ cm, } & 6.8 \text{ cm, } & 10.2 \text{ cm} \end{matrix}$

$$\begin{aligned} A \quad a^2 + b^2 &= c^2 \\ 5.1^2 + 3.4^2 &= 8.5^2 \\ 37.57 &= 72.25 \end{aligned}$$

D. No reason to check D.

$$\begin{aligned} B \quad a^2 + b^2 &= c^2 \\ 5.1^2 + 6.8^2 &= 8.5^2 \\ 72.25 &= 72.25 \end{aligned}$$

does not have a longest side



2. Paul and Jamie are making necklaces to sell at a craft fair. The tools and other start-up materials cost \$12.50. There is an additional cost of \$3.25 per necklace. Which equation can be used to find the total cost, c , of making a certain number of necklaces, n ?

A. $c = 3.25n$

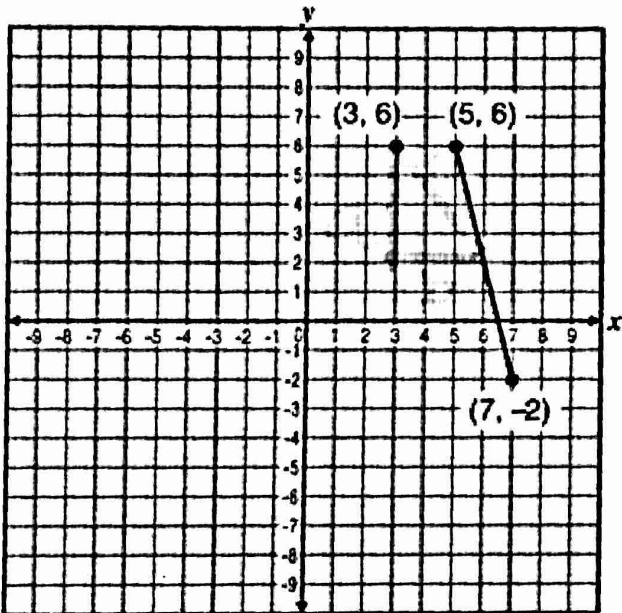
B. $c = 12.50n$

C. $c = 12.50 + 3.25n$

D. $c = 3.25 + 12.50n$

- 3.25 per necklace means 3.25 times the number of necklaces.
- 12.50 is a one time fee that is added only once.
- so the cost $C = 3.25n + 12.50$

3. What is the distance between Point(3, 6) and the midpoint of the line segment connecting Points(5, 6) and(7, -2)?



To find the mid pt use the formula

$$x = \frac{x_1 + x_2}{2} \quad y = \frac{y_1 + y_2}{2}$$

$$(5, 6) \quad (7, -2)$$

$$x = \frac{5+7}{2} = \frac{12}{2} = 6$$

$$y = \frac{6+(-2)}{2} = \frac{4}{2} = 2$$

mid point is (6, 2)

- A. 3
B. 5
C. 9
D. 25

$$a \quad b \quad c$$

$$4, 3, c$$

$$a^2 + b^2 = c^2$$

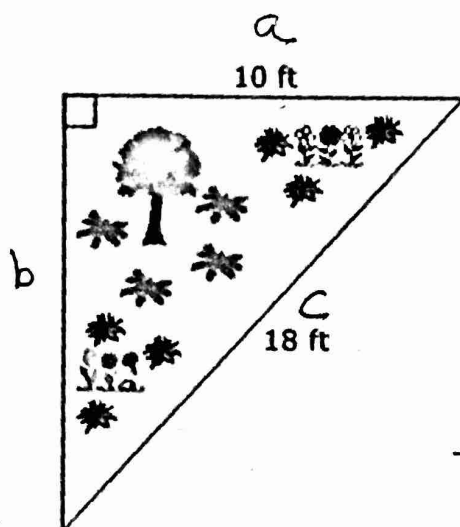
$$4^2 + 3^2 = c^2$$

$$25 = c^2$$

$$\sqrt{25} = \sqrt{c^2}$$

$$5 = c$$

4. Molly wants to put a fence around an area. The fence will follow the diagram of the triangle shown below.



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 10^2 + b^2 &= 18^2 \\
 100 + b^2 &= 324 \\
 -100 &\quad -100 \\
 \hline
 \end{aligned}$$

$$\begin{aligned}
 b^2 &= 224 \\
 \sqrt{b^2} &= \sqrt{224}
 \end{aligned}$$

$$\begin{aligned}
 b &= 14.966 \\
 b &= 15.
 \end{aligned}$$

About

how much fencing does Molly need?

- A. 28 ft
- B. 38 ft
- C. 43 ft
- D. 49 ft

Perimeter = add up all sides

$$P = 10 + 15 + 18$$

$$P = 43 \text{ feet}$$

5. A triangle has sides that measure 5 units, 12 units, and 13 units. Is this triangle a right triangle?

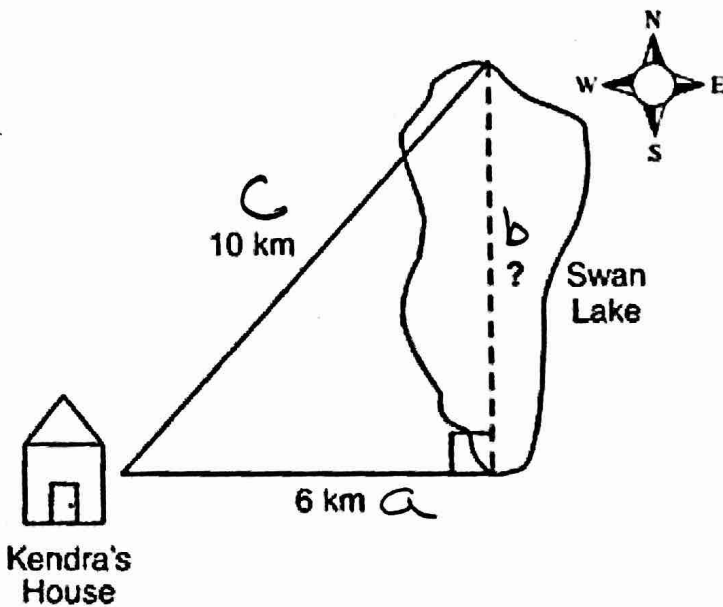
A. No, it is not a right triangle because $5^2 + 12^2 = 13^2$.

B. No, it is not a right triangle because $5^2 + 12^2 \neq 13^2$.

C. Yes, it is a right triangle because $5^2 + 12^2 \neq 13^2$.

$$\begin{array}{ccc} a & b & c \\ 5, & 12, & 13 \\ a^2 + b^2 = c^2 \\ 5^2 + 12^2 = 13^2 \\ 169 = 169 \\ \text{Yes} \end{array}$$

6. Kendra lives 10 km from the northern tip of Swan Lake and 6 km from the southern tip of Swan Lake.



$$\begin{array}{r}
 a \quad b \quad c \\
 6, \quad ?, \quad 10 \\
 a^2 + b^2 = c^2 \\
 6^2 + b^2 = 10^2 \\
 36 + b^2 = 100 \\
 \underline{-36} \qquad \qquad \qquad -36 \\
 b^2 = 64 \\
 \sqrt{b^2} = \sqrt{64} \\
 b = 8
 \end{array}$$

What is the north-south distance across Swan Lake?

7. Taylor uses the equation $y = 20x$ to calculate the amount she earns mowing x lawns. The graph below shows the amount Caleb earns mowing lawns.

Price per lawn is rate, a synonym for slope.

Taylor

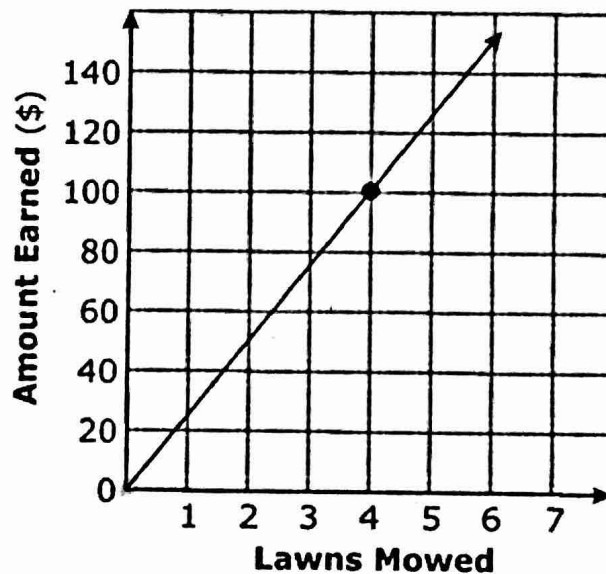
$$y = 20x$$

$$m = 20$$

remember when the equation is solved for y the coefficient to the x is the slope.

Taylor earns \$20/lawn.

Caleb's Earnings



Caleb

$$m = \frac{\text{rise}}{\text{run}}$$

$$m = \frac{100}{4}$$

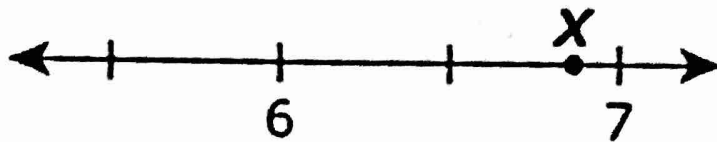
$$m = 25$$

Caleb earns \$25/lawn

Which statement is true?

- A. Taylor and Caleb earn the same amount per lawn.
- B. Taylor earns \$5 more per lawn than Caleb.
- C. Caleb earns \$5 more per lawn than Taylor.

8. Use the number line to answer the question.



Which number best approximates the value of x ?

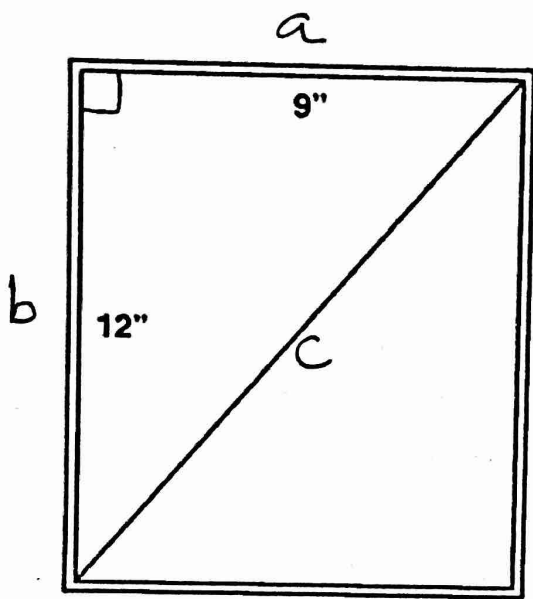
A. $\sqrt{6}$ - between 2 + 3

B. $\sqrt{7}$ between 2 + 3

C. $\sqrt{46}$ between 6 + 7

D. $\sqrt{52}$ between 7 + 8

9. A rectangular glass window is divided into two equivalent right triangles by a diagonal brace.



What is the length of the diagonal brace?

$$\begin{array}{ccc} a & b & c \\ 9 & 12 & \text{dia} \end{array}$$

$$a^2 + b^2 = c^2$$

$$9^2 + 12^2 = d^2$$

$$225 = d^2$$

$$\sqrt{225} = \sqrt{d^2}$$

$$15 = d$$

15 inches

10.

$$\frac{-4x - 2}{6} = -3$$

What value of x satisfies the equation
mult by the LCD

- A. 4
- B. -16
- C. 16
- D. -4

6 $\left(\frac{-4x - 2}{6} = -3 \right)$

$$\frac{1}{6} \cdot \frac{-4x - 2}{6} = \frac{-4x - 2}{1}$$

$$\begin{array}{r} -4x - 2 = -18 \\ +2 \qquad +2 \\ \hline -4x = -16 \\ \frac{-4}{-4} \quad \frac{-4}{-4} \\ x = 4 \end{array}$$

11. Two functions are represented below.

Function 1:

$$4x - 2y = -2$$

$$\begin{array}{l} \rightarrow 4x - 2y = -2 \\ -4x \quad \quad \quad -4x \end{array}$$

Solve for y to put it into the Slope intercept form.

Function 2:

$$\begin{array}{l} -2y = -4x - 2 \\ \hline -2 \quad \quad \quad -2 \quad \quad \quad -2 \end{array}$$

$$y = 2x + 1$$

$b = 1$ so the y -int is $(0, 1)$

x	y
-1	3
0	1
1	-1
2	-3

the y -int occurs when $x = 0$.

The y -int are equal

- A. At least one of the functions does not have a y -intercept.
- B. Function 1 and Function 2 have y -intercepts that are equal.
- C. Function 1 has a y -intercept that is less than the y -intercept of Function 2.
- D. Function 1 has a y -intercept that is greater than the y -intercept of Function 2.

12. Quadrilateral PQRS is graphed in the coordinate plane.

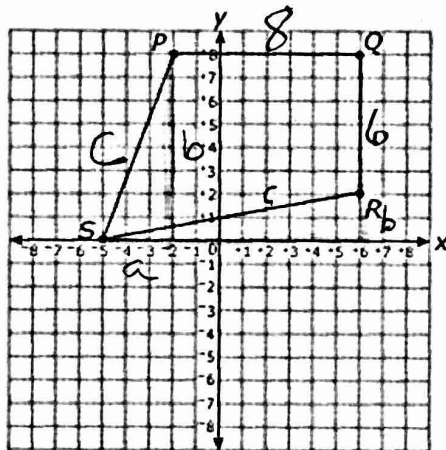
$$\begin{array}{l} RS \\ a \quad b \quad c \\ 11, 2, C \end{array}$$

$$11^2 + 2^2 = C^2$$

$$125 = C^2$$

$$\sqrt{125} = \sqrt{C^2}$$

$$11.2 = C$$



$$\begin{array}{l} PS \\ a \quad b \quad c \\ 3, 8, C \end{array}$$

$$a^2 + b^2 = C^2$$

$$3^2 + 8^2 = C^2$$

$$73 = C^2$$

$$\sqrt{73} = \sqrt{C^2}$$

$$8.5 = C$$

To the nearest tenth, what is the perimeter of quadrilateral

PQRS

?

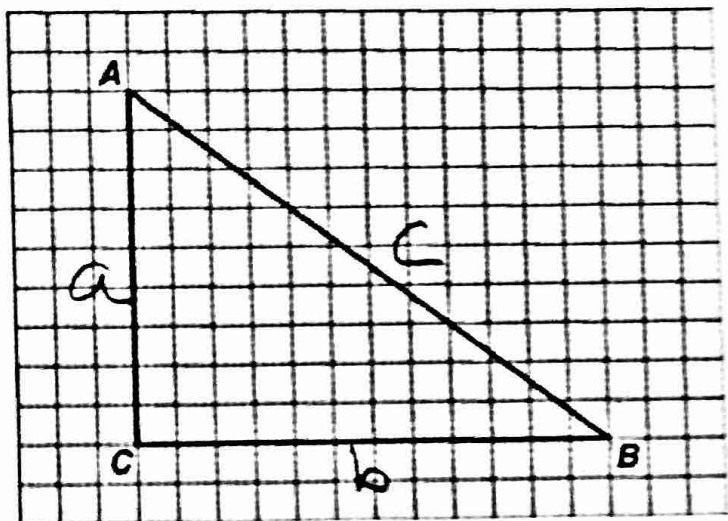
$P =$ add up all the sides

$$P = 11.2 + 8.5 + 6 + 8$$

$$P = 33.7 \text{ units}$$

A. 33.0 units

13. Triangle ABC is shown on the grid below.



Which value best represents the length of \overline{AB} ?

$$a \quad b \quad c$$
$$9, 12, c$$

$$a^2 + b^2 = c^2$$

$$9^2 + 12^2 = c^2$$

$$225 = c^2$$
$$\sqrt{225} = \sqrt{c^2}$$

$$15 = c$$

15 units

14. Which of the following numbers is irrational?

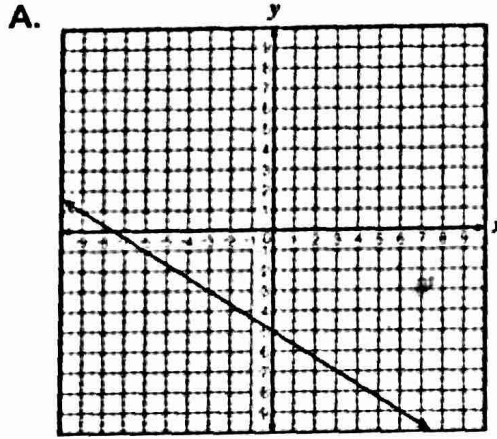
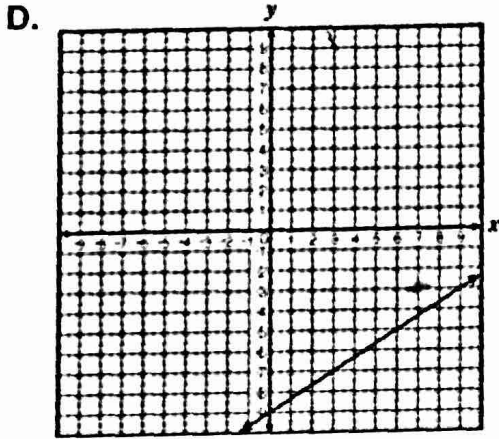
A. -6 - Integer

B. -0.45 - rational, the decimal terminates or ends

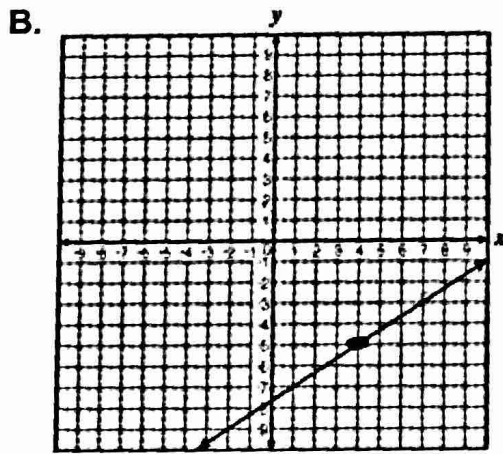
C. $\frac{2}{3}$ - rational, it is a fraction

D. $\sqrt{10}$ - irrational, it does not work out evenly.

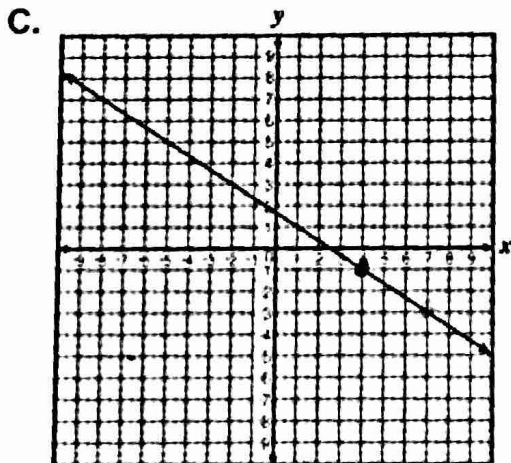
15. Which graph best represents a line with a slope of $-\frac{2}{3}$ that passes through $(7, -3)$?



A + D Does not pass through $(7, -3)$.



$$m = \frac{2}{3}$$



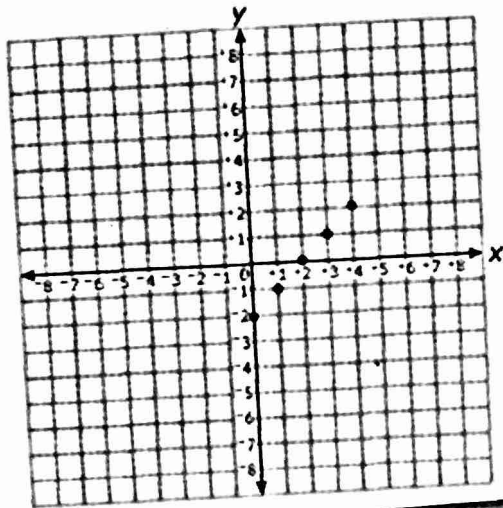
$$m = -\frac{2}{3}$$

16. In which graph do all of the plotted points lie on the line $y = x + 2$?

$$m = 1$$

$$b = (0, 2)$$

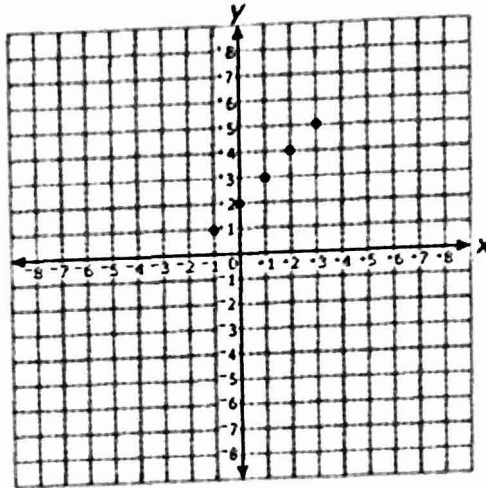
A.



$$m = \frac{1}{1} = 1$$

$$b = (0, -2)$$

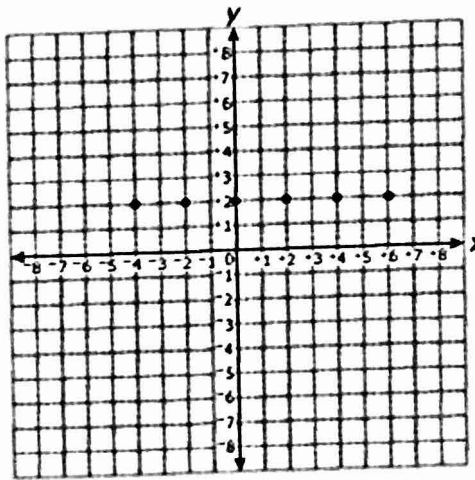
B.



$$m = \frac{1}{1} = 1$$

$$b = (0, 2)$$

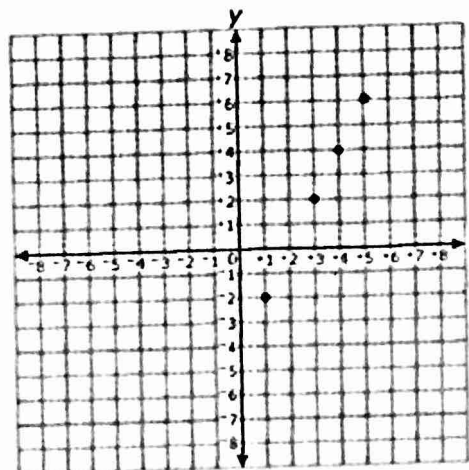
C.



$$m = \frac{0}{1} = 0$$

$$b = (0, 2)$$

D.



$$m = \frac{2}{1} = 2$$

$$b = (0, -4)$$

17. Which relation is a function? - each x can only be listed once.

A. $\{(2, 6), (3, 9), (4, 12), (5, 15)\}$ each only listed once

B. $\{(-4, -8), (-4, -2), (4, 8), (4, 2)\}$ -4 & 4 listed twice

C. $\{(-3, -2), (-1, 0), (0, 1), (0, 4)\}$ 0 listed twice

D. $\{(2, 4), (2, 5), (3, 5), (3, 6)\}$ 2 & 3 listed twice

18. Which equation represents a nonlinear function?

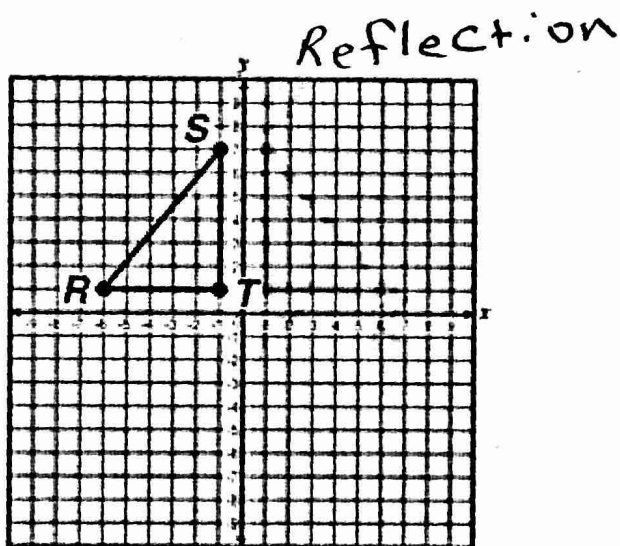
A. $y = \frac{x}{2} - 4$

B. $y = x^2 + \frac{3}{4}$ - Nonlinear, the x var has an exp.

C. $y = \frac{4}{3}x - \frac{2}{3}$

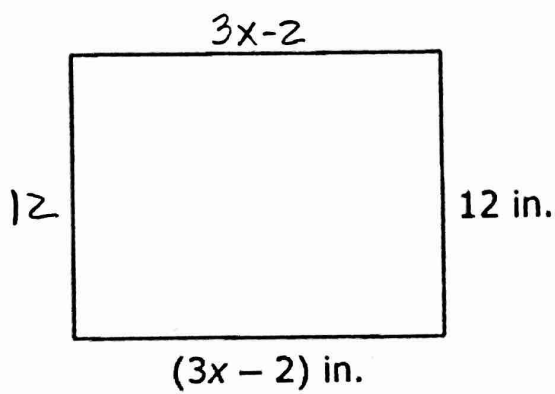
D. $y = -5x + 1$

19. The graph below shows Triangle RST .



Which figure represents a reflection of Triangle RST over the y -axis?

20. The perimeter of the rectangle below is 56 in.



$P =$ add up all the sides

$$\begin{aligned} 56 &= \underbrace{3x-2}_m + \underbrace{12}_m + \underbrace{3x-2}_m + \underbrace{12}_m \\ 56 &= 6x + 20 \\ -20 & \quad -20 \\ \hline 36 &= 6x \\ \underline{6} & \quad \underline{6} \\ 6 &= x \end{aligned}$$

What is the value of x ?

21. Which function has a greater rate of change than the function that passes through the points given in the table below?

rate of change is a synonym for slope.

x	y
4	2
6	3
8	4

PICK 2 points
 (x_1, y_1) (x_2, y_2)
 $(4, 2)$ $(6, 3)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{3 - 2}{6 - 4}$$

$$m = \frac{1}{2}$$

Solve for y to get the slope-intersect form

A. $3x - 5y = 25$

B. $7y - 3x = 14$

C. $y = 1 + \frac{1}{2}x$
 $m = \frac{1}{2}$

A

$$\begin{array}{r} 3x - 5y = 25 \\ -3x \quad -3x \\ \hline -5y = -3x + 25 \\ \frac{-5y}{-5} = \frac{-3x}{-5} + \frac{25}{-5} \\ y = \frac{3}{5}x - 5 \\ m = \frac{3}{5} \end{array}$$

B

$$\begin{array}{r} 7y - 3x = 14 \\ +3x \quad +3x \\ \hline 7y = 3x + 14 \end{array}$$

$$\frac{7y}{7} = \frac{3x}{7} + \frac{14}{7}$$

$$y = \frac{3}{7}x + 2$$

$$m = \frac{3}{7}$$

22. Which table of values corresponds to the equation $y = 5x - 3$?

$$m = 5$$

$$b = (0, -3)$$

A.

x	y
0	-5
-1	-8

$$b = (0, -5)$$

2	1
-3	-14

B.

x	y
0	0
-1	-2
2	4
-3	-6

$$b = (0, 0)$$

C.

x	y
0	-3
-1	2
2	7
-3	12

$$b = (0, -3)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 2}{0 - -1} = \frac{-5}{1} = -5$$

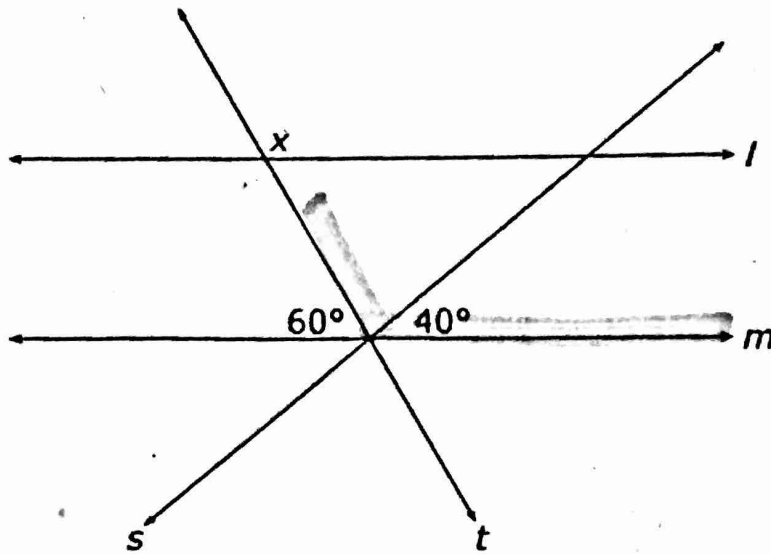
D.

x	y
0	-3
-1	-8
2	7
-3	-18

$$b = (0, -3)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-8 - -3}{-1 - 0} = \frac{-5}{-1} = 5$$

23. Lines l and m are parallel to one another and cut by transversals s and t .



What is the value of

x
?

$\angle X$ and the highlighted angle are corresponding angles.

The green angle and the 60° angle are supplementary.

$$\begin{array}{r} \text{green} + 60 = 180 \\ -60 \quad -60 \\ \hline \text{green} = 120 \end{array}$$

A. 40°

B. 80°

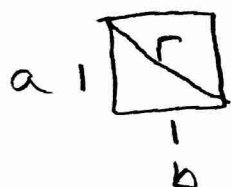
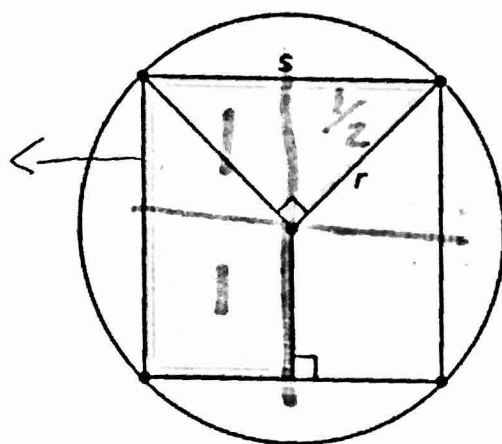
C. 120°

D. 140°

Since $\angle X$ and the green angle are corresponding angles, they are congruent.

$$X = 120^\circ$$

24. The figure below shows a square inscribed in a circle. The area of the shaded region is 2.5 square units.



$$1^2 + 1^2 = r^2$$

$$2 = r^2$$

What is the
approximate
area of the circle?

- A. 3.1 square units
- B. 4.7 square units
- C. 6.3 square units
- D. 7.9 square units

When we divide the square into 4 sections, there are $2\frac{1}{2}$ sections and the area is 2.5, so each section is 1. The only way for the area is 1, then the sides are 1. If the sides are 1, we use the Ph. Th. to find the diagonal r .

The area of a circle is πr^2 , since $r^2 = 2$ we get
 $\pi \cdot 2 = 6.28 = 6.3$

25. Which list of numbers is ordered from least to greatest?

A. $-8, -\sqrt{65}, -8.5$

B. $-8.5, -\sqrt{65}, -8$

C. $-\sqrt{65}, -8.5, -8$

$$-\sqrt{65} = -8.1$$

$$-8.5, -\sqrt{65}, -8$$

Remember
negative is debt
so less debt is
more money.