

Name: _____

Key

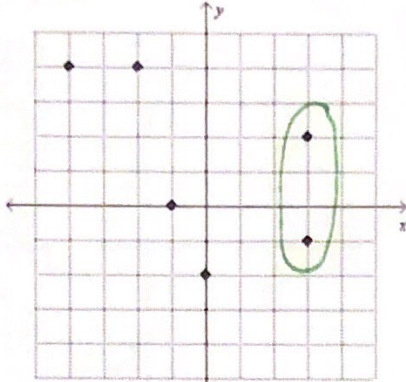
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1. Is the relation a function? Write Yes or No. Then tell why or why not.

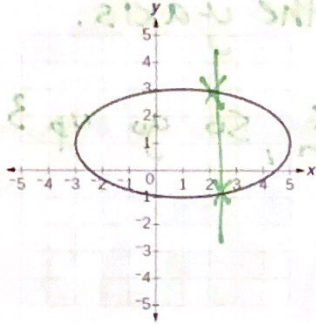
a.



No - points are stacked

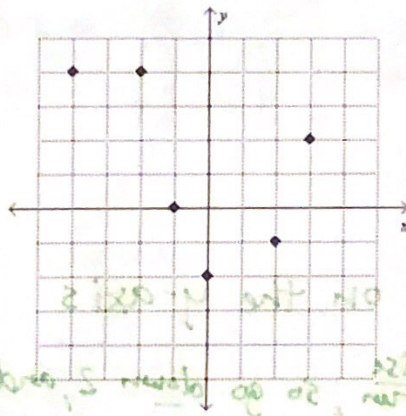
← Sorry about the Sharpie coming through

b.



No - fails vertical line test

c.



Yes - no points stacked

2. Is this relation a function? Tell why or why not.

$\{(5, 3), (2, 8), (-5, -1), (4, 7), (2, 1)\}$

No - 2 is paired with both 8 and 1. x can only be paired with one y.

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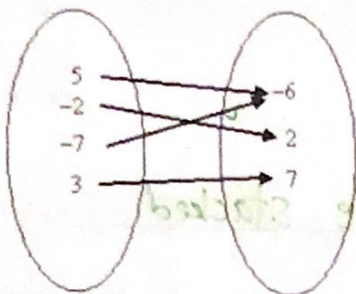
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Is this relation a function? Tell why or why not.

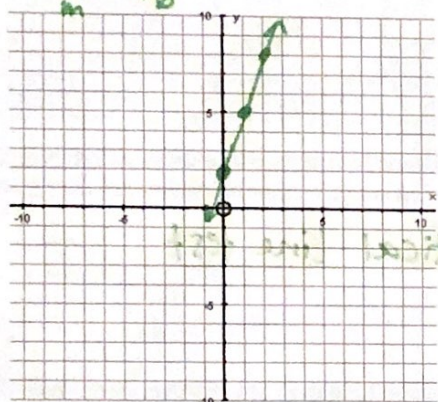
Yes - Each x points to one y.

3.



Graph this linear equation.

4. $y = 3x + 2$



Start at 2 on the y-axis.

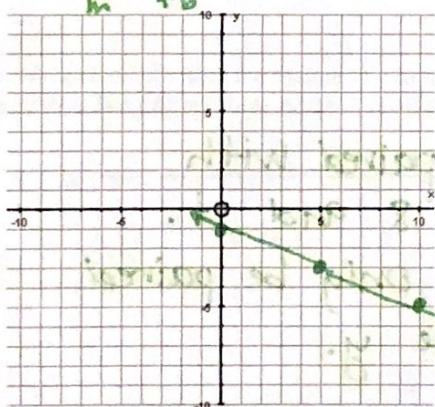
Slope = $3 = \frac{3}{1} = \frac{\text{rise}}{\text{run}}$, so go up 3 and over 1

OR: Choose 3 x's and find their y's.

x	3x+2	y
0	3·0+2	2
1	3·1+2	5
2	3·2+2	8

Graph this linear equation.

5. $y = -\frac{2}{5}x - 1$



Start at -1 on the y-axis

Slope = $-\frac{2}{5} = \frac{\text{rise}}{\text{run}}$, so go down 2, and over 5.

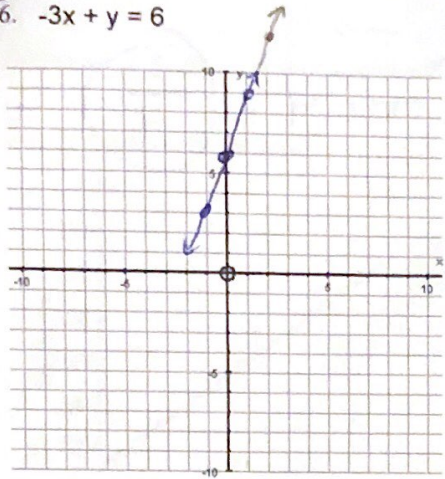
OR: Choose 3 x's and find their y's.

x	$-\frac{2}{5}x - 1$	y
0	$-\frac{2}{5} \cdot 0 - 1$	-1
1	$-\frac{2}{5} \cdot 1 - 1$	$-1\frac{2}{5}$
2	$-\frac{2}{5} \cdot 2 - 1$	$-1\frac{4}{5}$

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Graph this linear equation.

6. $-3x + y = 6$



First, put in slope-intercept form,

$$y = mx + b.$$

$$\begin{array}{r} -3x + y = 6 \\ +3x \quad \quad +3x \\ \hline \end{array}$$

$$y = \underset{\substack{\uparrow \\ m}}{3}x + \underset{\substack{\uparrow \\ b}}{6}$$

OR:

x	$-3x + y = 6$	y
0	$-3 \cdot 0 + y = 6$	6
1	$-3 \cdot 1 + y = 6$ $-3 + y = 6$	9
2	$-3 \cdot 2 + y = 6$ $-6 + y = 6$	12

Start at 6 on the y axis

slope = 3 so go up 3, over 1.

Find the slope of the line that passes through the pair of points.

7. $(-5, -2), (3, -2)$

$$\text{slope} = m = \frac{\Delta y}{\Delta x} = \frac{-2 - (-2)}{-5 - 3} = \frac{-2 + (+2)}{-5 + (-3)} = \frac{0}{-8} = 0$$

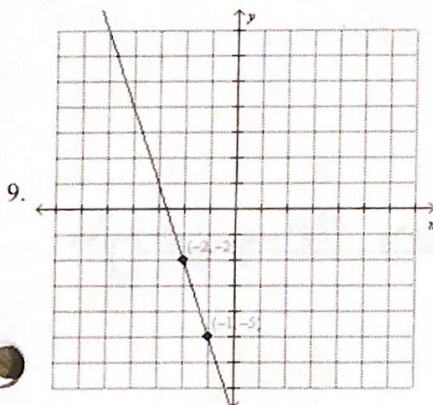
(horizontal line)

8. $(2, 7), (8, -6)$

$$\text{slope} = m = \frac{\Delta y}{\Delta x} = \frac{7 - (-6)}{2 - 8} = \frac{7 + (+6)}{2 + (-8)} = \frac{13}{-6}$$

should be -6

Find the slope of the line.



Use rise over run - Don't need coordinates.

$$\text{Down 3, over 1} = \frac{-3}{1} \text{ or } -3$$

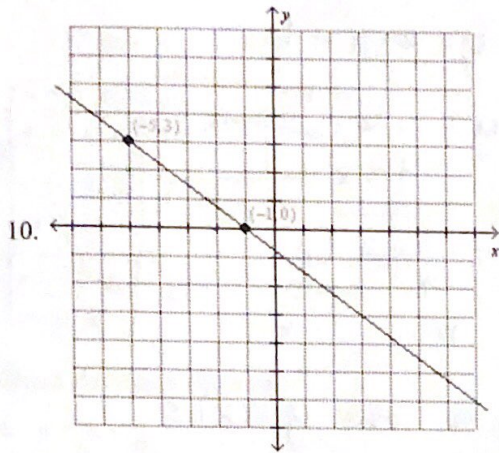
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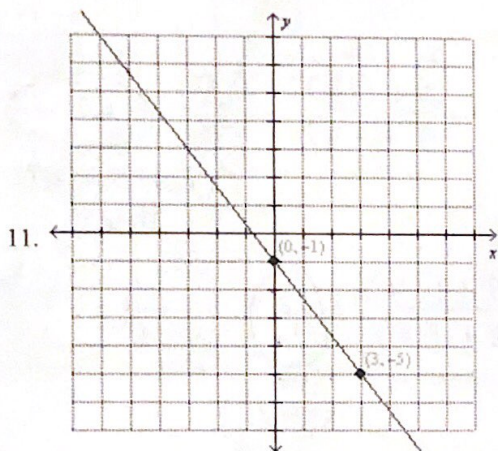
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Find the slope of the line.



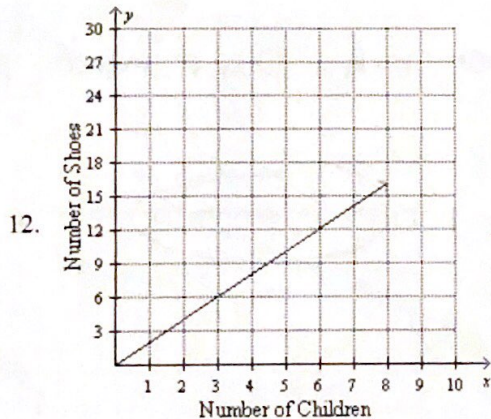
Use $\frac{\text{rise}}{\text{run}}$ \rightarrow
Down 3, over 4 = $\left(\frac{-3}{4}\right)$

Find the slope of the line



Use $\frac{\text{rise}}{\text{run}}$ \rightarrow
Down 4, over 3 = $\left(\frac{-4}{3}\right)$

Determine if there is a proportional linear relationship (a direct variation). Explain why or why not.

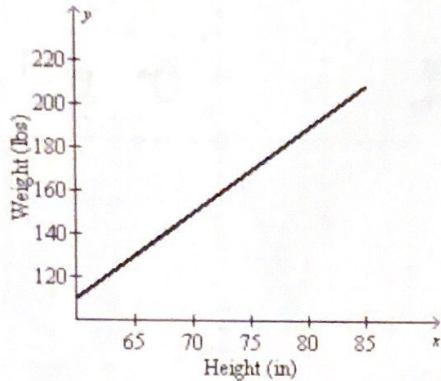


Yes - straight line through origin.

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Determine if the function is proportional (a direct variation). Explain why or why not.

13. Average Weight and Height (Men)



No - does not start at origin.

Determine if the function is proportional (a direct variation). Explain why or why not.

14. $y = 2x$

Yes - follows format of $y = mx$

15. The amount a spring will stretch varies directly with the amount of weight attached to the spring. If a spring stretches 4 inches when 40 pounds is attached, write an equation to express this direct variation, where y is the number of inches stretched and x is the number of pounds attached.

direct variation $\rightarrow y = mx$

↑
What is m ?

The unit rate, or inches per pound in this case.

$y = mx$
inches \rightarrow y \leftarrow pounds

$$\frac{4}{40} = \frac{m \cdot 40}{40}$$

$$\frac{4}{40} = m$$

$$\frac{1}{10} = m$$

So $y = mx$ becomes

$$y = \frac{1}{10}x$$

or

$$y = 0.1x$$

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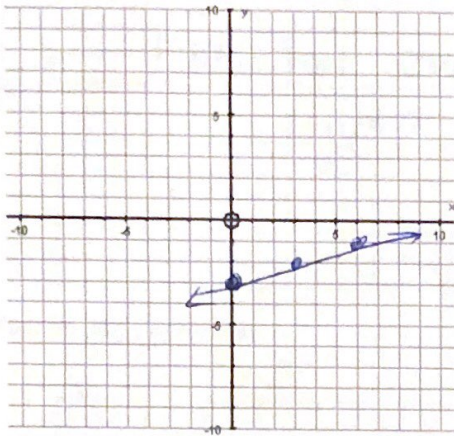
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Graph this equation using the slope and the y-intercept.

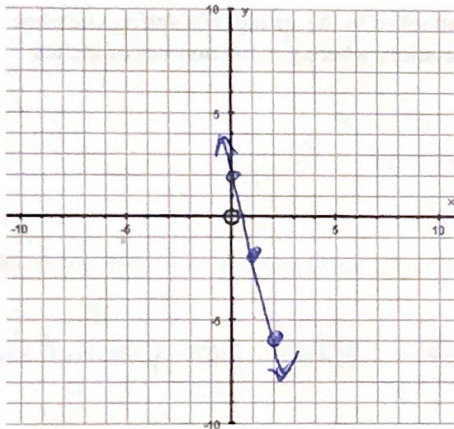
15. $y = \frac{1}{3}x - 3$

Start at -3 .

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{1}{3} \text{ so go up } 1, \text{ over } 3.$$

Graph this equation using the slope and the y-intercept.

16. $y + 4x = 2$



Put in slope-intercept form.

$$y + 4x = 2$$

$$\frac{-4x}{-4x} \quad \frac{-4x}{-4x}$$

$$y = -4x + 2$$

Start at 2 .

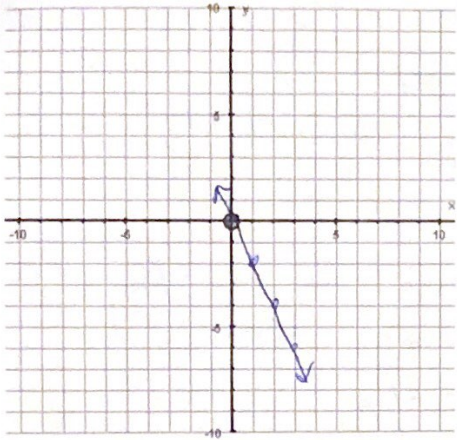
$$\text{slope} = \frac{\text{rise}}{\text{run}} = -4 = \frac{-4}{1}$$

So go down 4 ,
over 1 .

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Graph this equation using the slope and the y-intercept.

17. $y = -2x$



$y = -2x$ is a direct variation
so it goes through the origin.

You can also think of it as

$y = -2x + 0$.

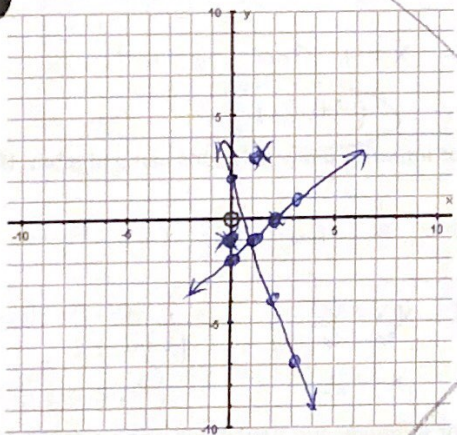
Start at 0.

slope = $-2 = -\frac{2}{1}$ so go down 2,
over 1.

Had to change this one.

19. Solve the system by graphing. Determine whether the system of equations has one solution, no solution, or infinitely many solutions by graphing. If the system has one solution, name it as an ordered pair.

~~$y = -3x + 2$
 $y = x - 2$~~



~~$y = -3x + 2$
start at 2, slope = $-3 = -\frac{3}{1}$
Go down 3,
over 1.~~

~~$y = x - 2$
start at -2, slope = $\frac{1}{1} = \frac{1}{1}$
Go up 1,
over 1.~~

Where do the lines cross?

At the point $(1, -1)$