

MAKING & USING A STUDY GUIDE for a test

Study Guide Exam-4: Linear Functions

Study Guide: helps you ^① summarize,
^② visualize, and ^③ analyze
concepts learned in class

* Warning: simply making a study guide
does not guarantee you an
A+ on the test.

Study Guide Exam-4: Linear Functions

1

Drag and drop each pair of points into the correct category to show whether each set of points is on a line that has a positive slope, negative slope, zero slope, or undefined slope.

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

(1, 2) and (-4, 10)

x_1, y_1 x_2, y_2

$$m = \frac{10 - 2}{-4 - 1} = \frac{8}{-5} = \text{Negative Slope}$$

(3, 5) and (12, -4)

x_1, y_1 x_2, y_2

$$m = \frac{-4 - 5}{12 - 3} = \frac{-9}{9} = -1 = \text{Negative Slope}$$

(3, 0) and (6, 4)

$$m = \frac{4 - 0}{6 - 3} = \frac{4}{3} = \text{Positive Slope}$$

(-5, 2) and (-5, 10)

$$m = \frac{10 - 2}{-5 - (-5)} = \frac{8}{0} = \text{Undefined Slope}$$

(-4, 5) and (6, 5)

$$m = \frac{5 - 5}{6 - (-4)} = \frac{0}{10} = \text{Zero Slope}$$

2

Drag and drop each point into the correct category to show whether each point could represent an x-intercept, y-intercept, both, or neither.

$(x, 0)$

$(0, y)$

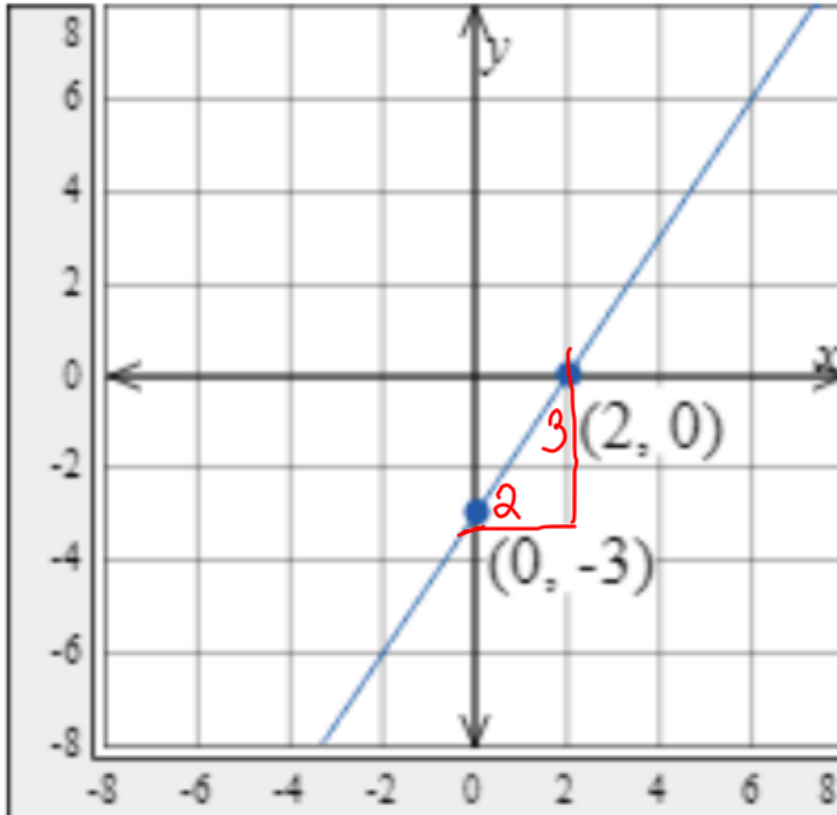
$(0, 0)$

(x, y)

x-intercept	y-intercept	both	neither
$(-8, 0)$			
$(16, 0)$	$(0, 4)$	$(0, 0)$	$(6, 7)$

3

Find the slope of the line. Enter your answer as a simplified fraction.

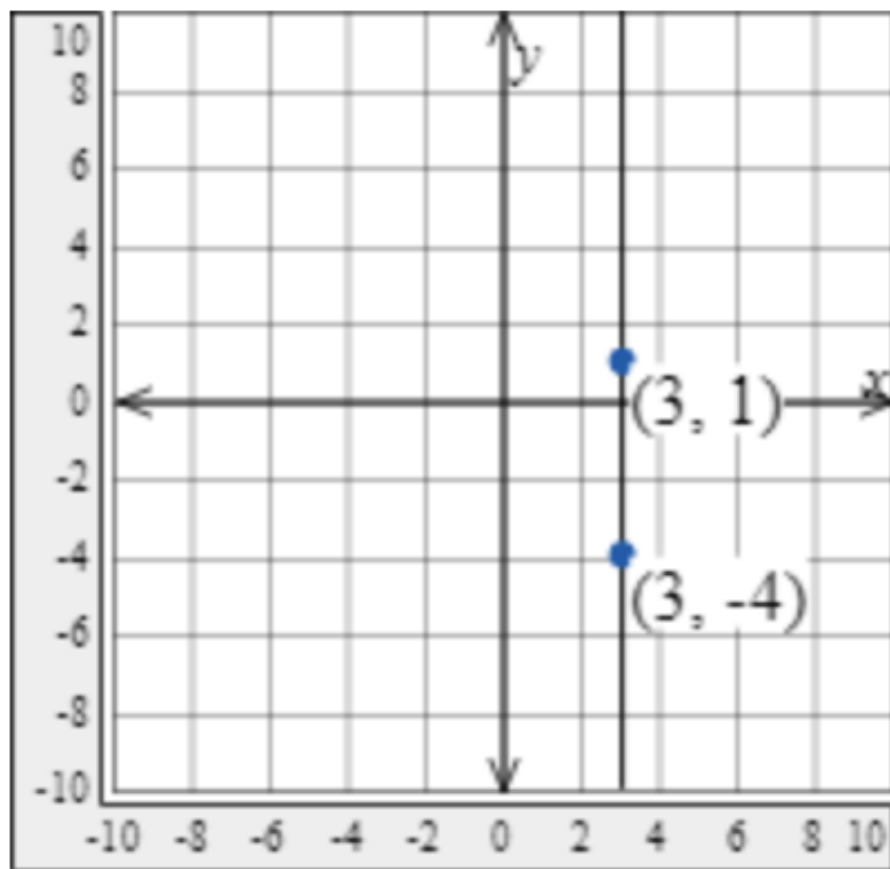


$$\frac{\text{Rise}}{\text{Run}} = \frac{3}{2}$$

$$\begin{aligned} \text{slope} &= \frac{\text{difference in } y\text{-values}}{\text{difference in } x\text{-values}} \\ &= \frac{-3 - 0}{0 - 2} \\ &= \frac{-3}{-2} \\ &= \frac{3}{2} \end{aligned}$$

4

Select the slope of the line.



Remember that the slope of a vertical line is undefined!

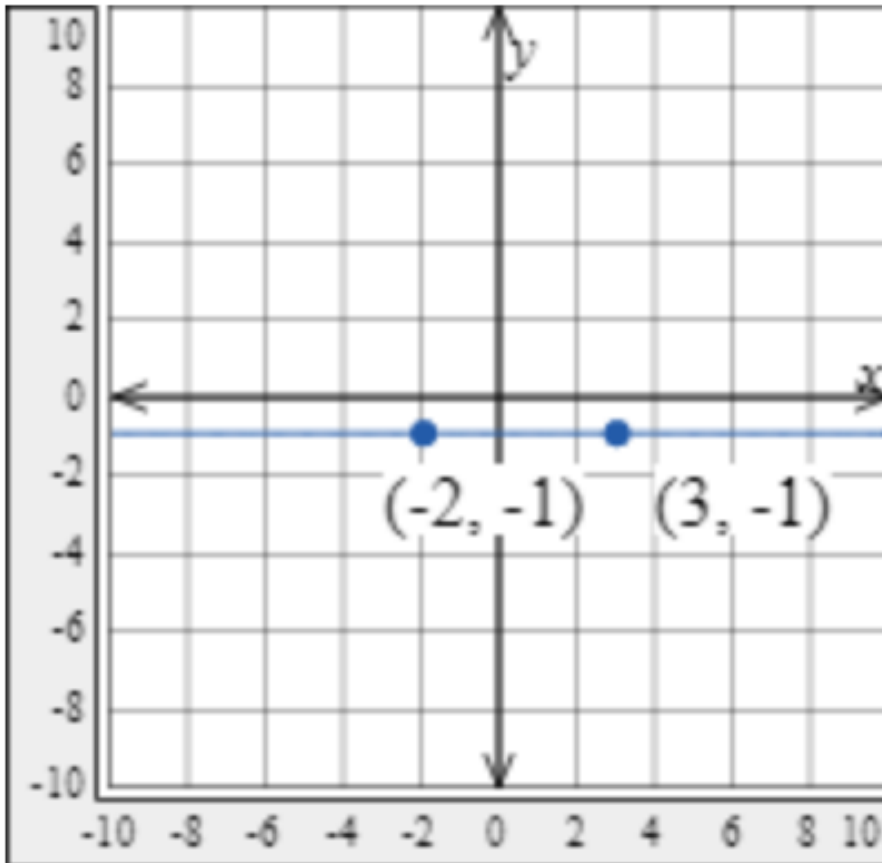
$$= \frac{-4 - 1}{3 - 3}$$

$$= \frac{-5}{0}$$

undefined.

5

Find the slope of the line. Enter your answer in simplest form.



Remember that the slope of a horizontal line is 0!

$$= \frac{-1 - (-1)}{-2 - 3}$$

$$= \frac{0}{-5}$$

$$= 0$$

Study Guide Exam-4: Linear Functions

Kristoff rents a kiosk in the mall to open an umbrella stand. He pays \$6 to the mall owner for each umbrella he sells. The amount Kristoff pays is given by $f(x) = 6x$, where x is the number of umbrellas sold. Graph the function and give its domain and range.

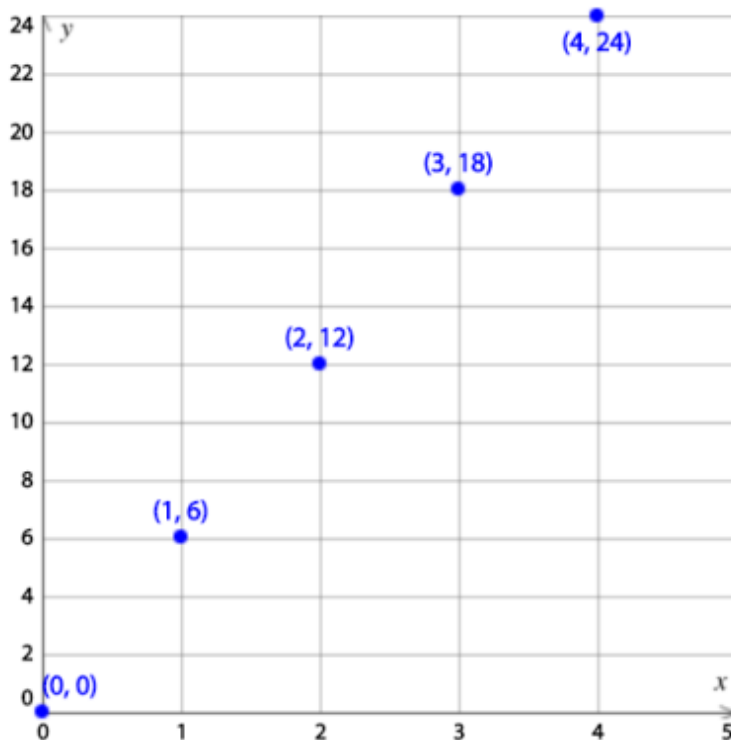
Part 1 ✓

Complete the second column of the function table.

x	$f(x) = 6x$
0	$f(0) = $ <input type="text" value="0"/>
1	$f(1) = $ <input type="text" value="6"/>
2	$f(2) = $ <input type="text" value="12"/>
3	$f(3) = $ <input type="text" value="18"/>
4	$f(4) = $ <input type="text" value="24"/>

Part 2 ✓

Graph the function and give its domain and range.



The domain is and the range is .

6

7

Same as #6 !!

8

Same as #6 !!

9

Is the equation linear? Select Yes or No for each equation.

$$-\frac{3}{4}x - \frac{1}{2}y = 2$$



Yes



No

$$y = x^2 - 5$$



Yes



No

$$-\frac{2}{x} = y + 12$$



Yes



No

Degree on the exponent must be 1.

There must be no variable in the denominator (Fractions of numbers are ok.)

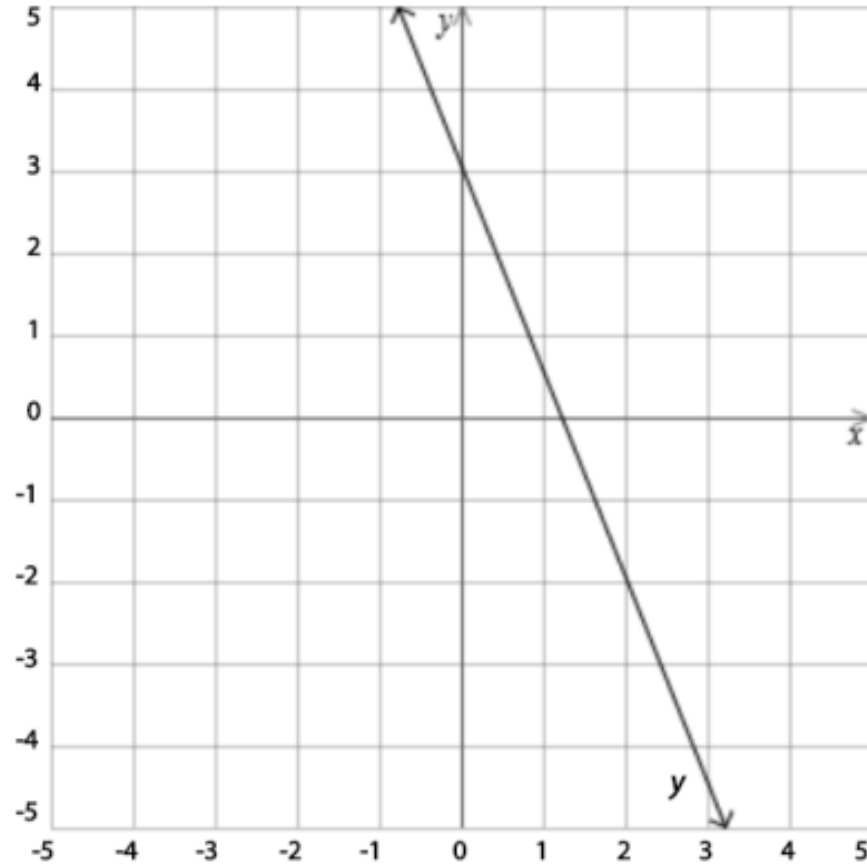
10

slope-intercept form

Solve for y

$$5x = -2y + 6$$

$$\begin{array}{r|l} -6 & -6 \\ \hline -\frac{5}{2}x - 6 & -2y \\ \hline -\frac{5}{2}x + 3 & = y \end{array}$$



I plotted a point at the y-intercept, (0, 3). I then used the slope to move 5 units down and 2 units to the right and find another point on the line. I connected these points to draw the line.

11

Part 1



Determine whether the equation is linear.

$x^5 + y = 2$ is .

Part 2



Explain why $x^5 + y = 2$ is not linear.

$x^5 + y = 2$ is not linear because .

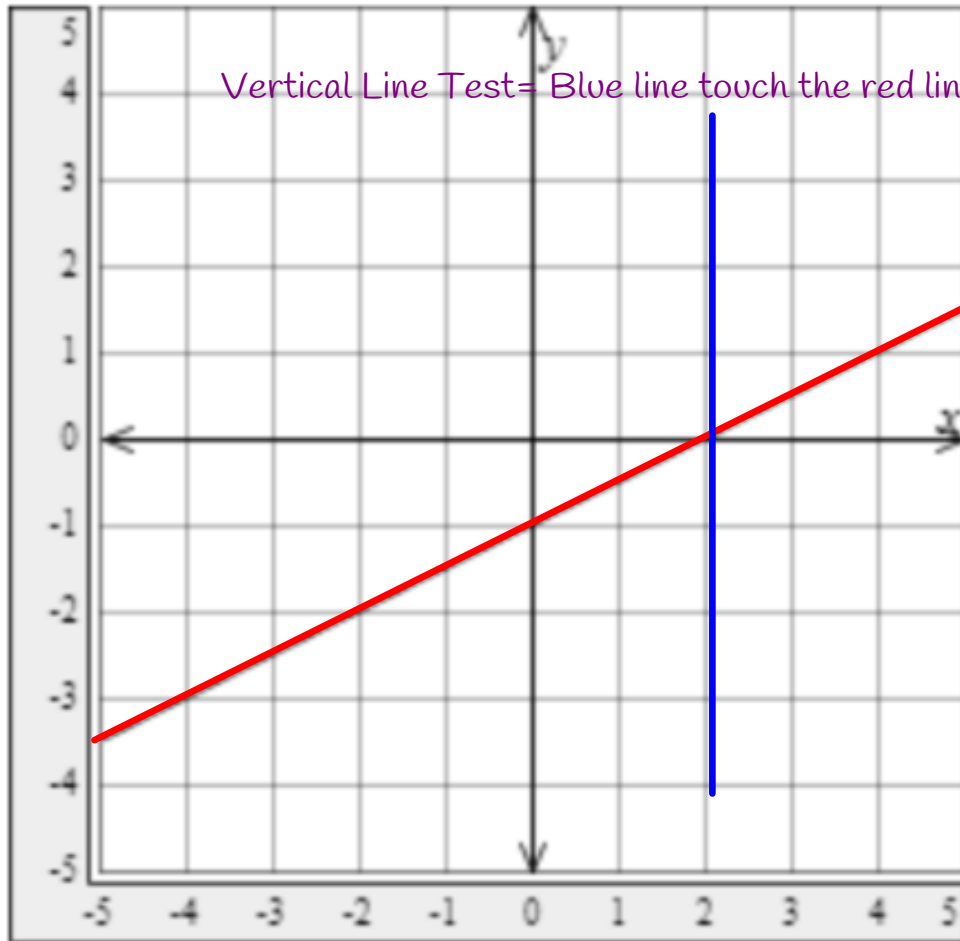
12

Same as #9 !!

When a linear equation is written in standard form the following are true.

- x and y both have exponents of 1.
- x and y are not multiplied together.
- x and y do not appear in denominators, exponents, or radicands.

Is the relation represented on the graph a function? Complete the explanation.



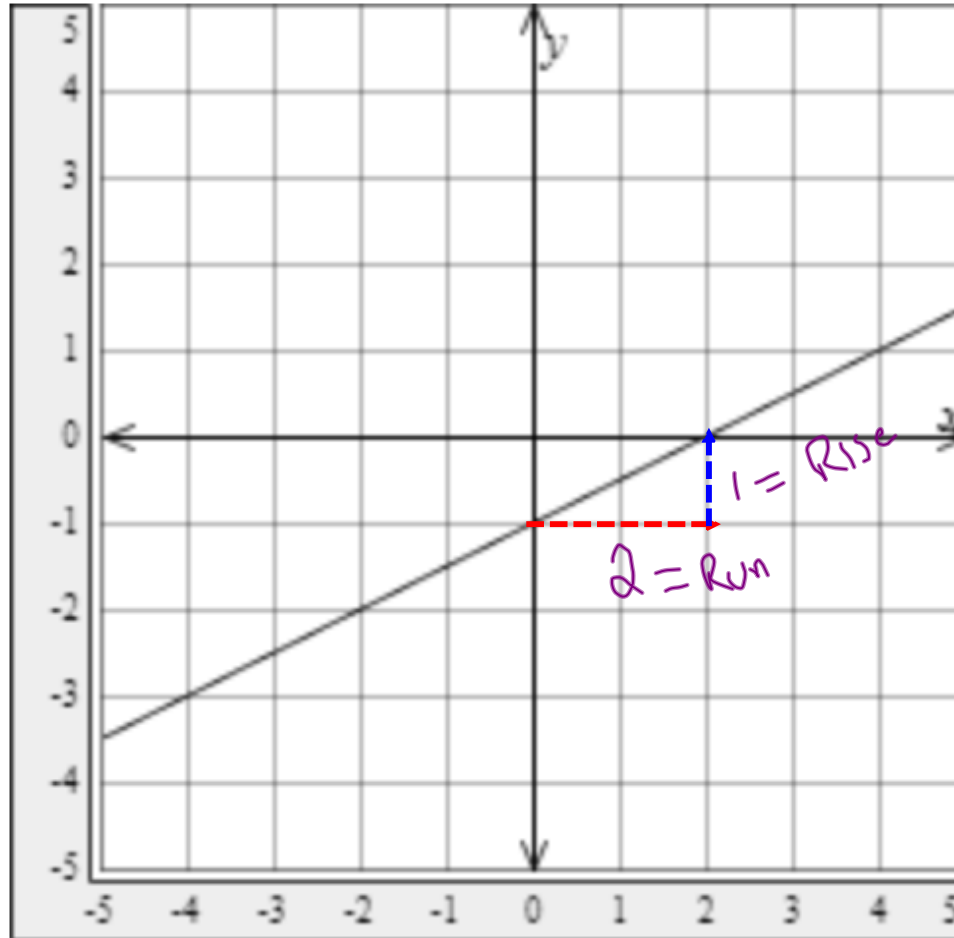
Vertical Line Test= Blue line touch the red line one time only.

13

It is a function, because it passes the vertical line test.

14

What is the slope of the line shown on the graph?

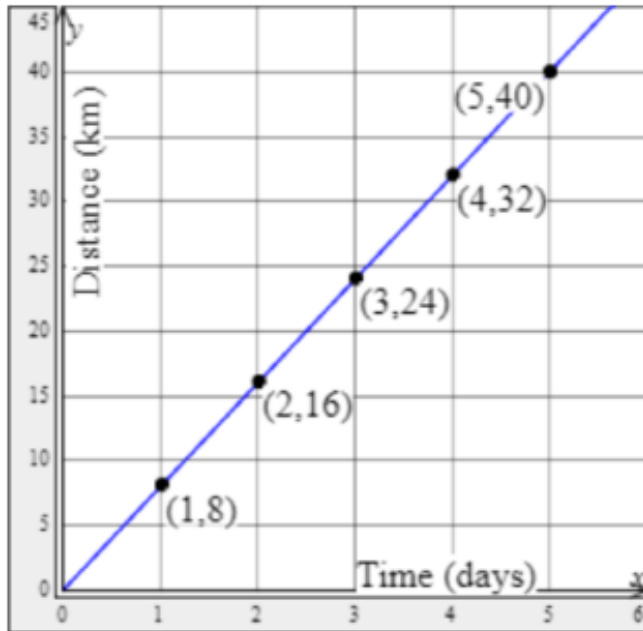


$$\frac{\text{Rise}}{\text{Run}} = \frac{1}{2}$$

Pick two points on the line, then use the slope formula.

15

The migration pattern of a species of tree frog to different swamp areas over the course of a year can be described using the graph below. Fill in the table and express whether this pattern follows a linear function. If the migration pattern is a linear function, express what constant change in y corresponds to a constant change in x .



x	y
1	<input type="text" value="8"/>
2	<input type="text" value="16"/>
3	<input type="text" value="24"/>
4	<input type="text" value="32"/>
5	<input type="text" value="40"/>

This pattern follows a function.

Therefore, .

16

Find the x - and y -intercepts.

$$5x + 8y = 64$$

Separate into two equations and solve

The x -intercept

$$\frac{5x}{5} = \frac{64}{5}$$

$$x = \frac{64}{5}$$

The y -intercept

$$\frac{8y}{8} = \frac{64}{8}$$

$$y = 8$$

17

Same as #16 !!

To find the x -intercept, Set the variable y equal to 0 and solve for x .

To find the y -intercept, Set the variable x equal to 0 and solve for y .



18

Use intercepts to graph the line described by the equation.

$$14y = -7x - 42$$

Set $x=0$:

$$\frac{14y}{14} = \frac{-42}{14}$$

$$y = -3$$

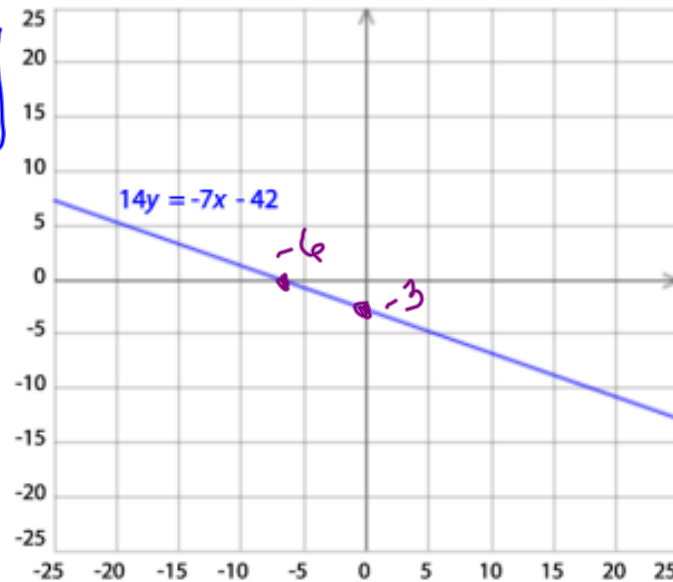
Set $y=0$:

$$0 = -7x - 42$$

$$+7x \quad | \quad +7x$$

$$\frac{7x}{7} \quad | \quad \frac{-42}{7}$$

$$x = -6$$



19

Same as #16 !!

To find the x-intercept, Set the variable y equal to 0 and solve for x .



To find the y-intercept, Set the variable x equal to 0 and solve for y .

20

Same as #16 !!

To find the x-intercept, Set the variable y equal to 0 and solve for x .



To find the y-intercept, Set the variable x equal to 0 and solve for y .

21

Find the x - and y -intercepts.

$$\frac{3}{5}x + \frac{1}{2}y = 30$$

multiply by the
reciprocal.

x -intercepts.

$$\cancel{\frac{3}{5}}x = \cancel{30} \cdot \cancel{\frac{5}{3}}$$

$$x = 50$$

y -intercepts.

$$\cancel{2} \cdot \frac{1}{\cancel{2}}y = 30 \cdot \cancel{2}$$

$$y = 60$$

22

Same as #16 !!

To find the x -intercept, Set the variable y equal to 0 and solve for x .

To find the y -intercept, Set the variable x equal to 0 and solve for y .



23

Same as #18 !!

To find the x -intercept, Set the variable y equal to 0 and solve for x .

To find the y -intercept, Set the variable x equal to 0 and solve for y .



24

Same as #18 !!

To find the x -intercept, Set the variable y equal to 0 and solve for x .

To find the y -intercept, Set the variable x equal to 0 and solve for y .



25

Same as #18 !!

To find the x -intercept, Set the variable y equal to 0 and solve for x .

To find the y -intercept, Set the variable x equal to 0 and solve for y .

