

GRAPHING LINEAR RELATIONS

➤ Label the x and y axis. Label all the arrows necessary to identify that lines and axes extend from and to infinity.

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

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

This means 3 up/down

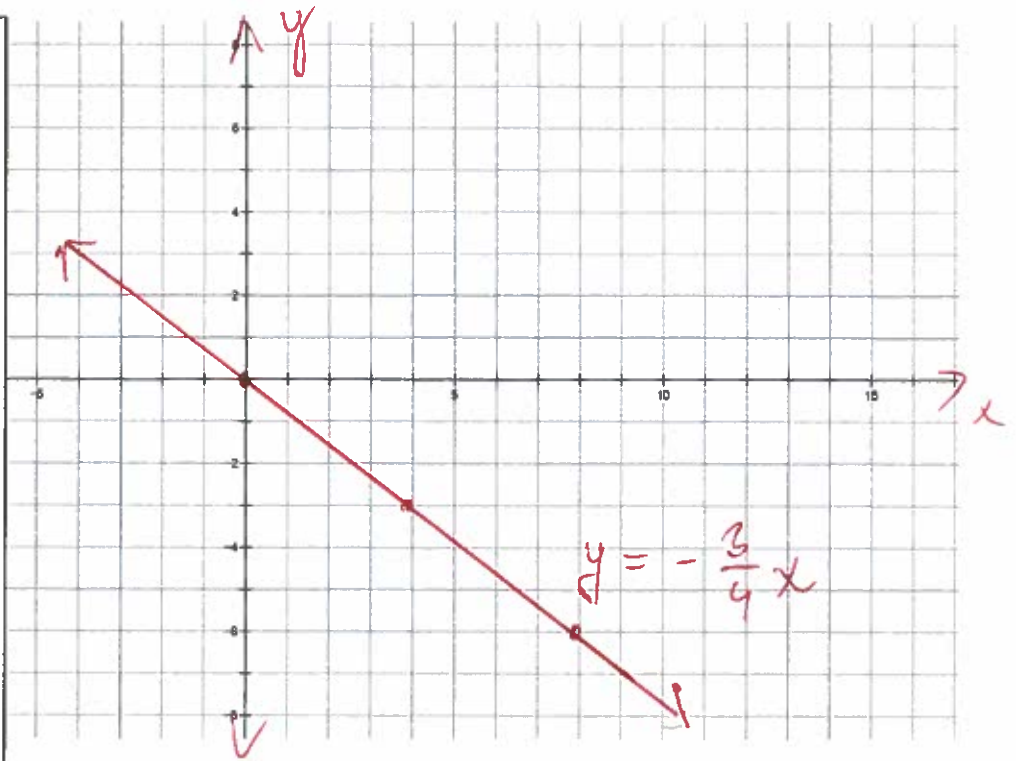
and over 4

y-intercept = 0

coordinates of the y-intercept $(0, 0)$

The line is decreasing

BONUS: coordinates of the x-intercept
 $(0, 0)$



2. $y = 0.5x - 3$

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

This means 1 up/down

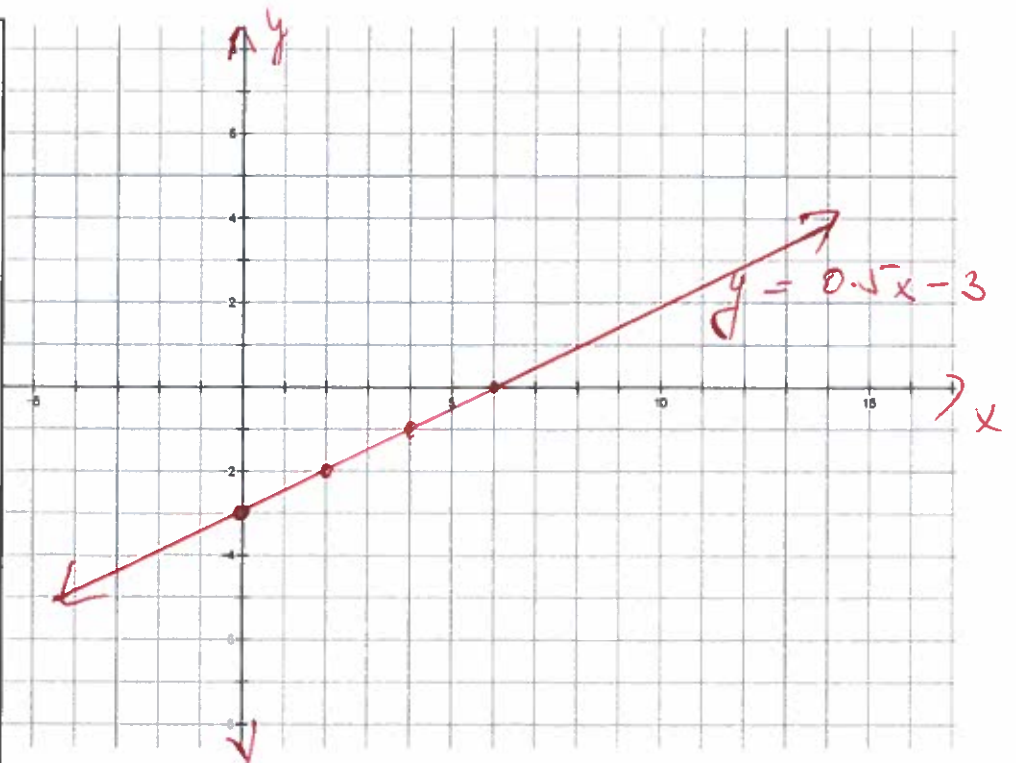
and over 2

y-intercept = -3

coordinates of the y-intercept $(0, -3)$

The line is increasing

BONUS: coordinates of the x-intercept
 $(6, 0)$



3. $y = -1.6x + 1$

Slope = $-1.6 = \frac{-16}{10} = \frac{-8}{5}$

This means 8 up / down

and over 5

y-intercept = 1

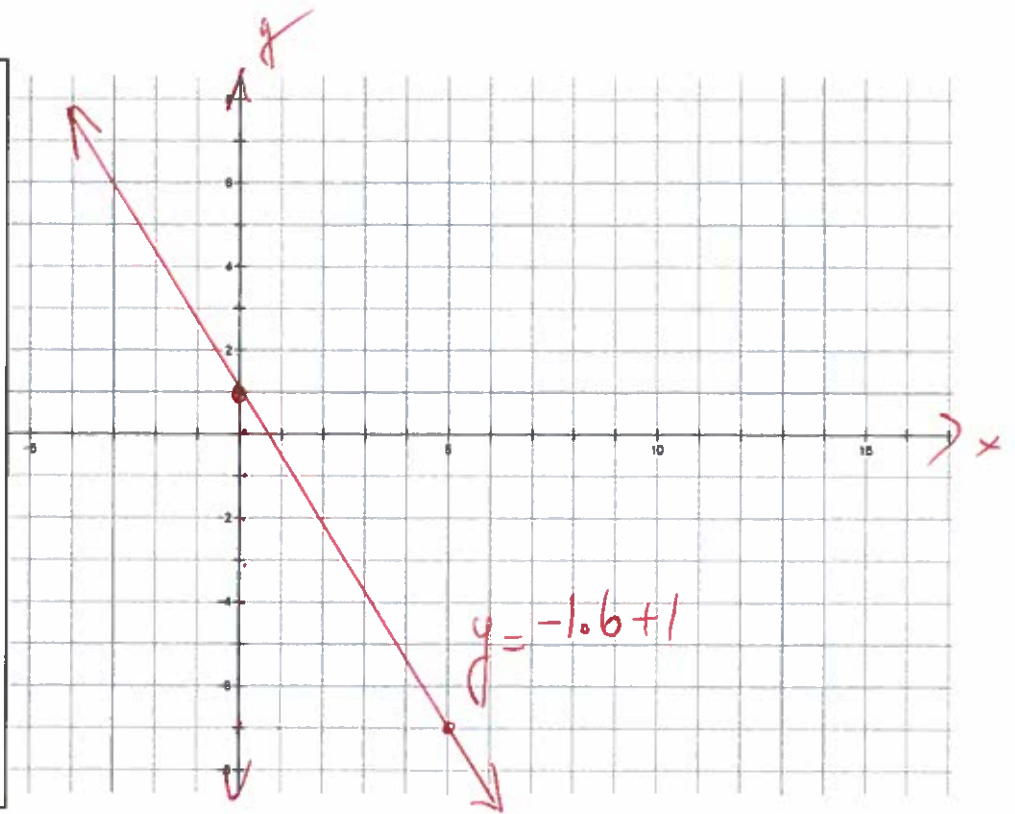
coordinates of the y-intercept (0, 1)

The line is decreasing

BONUS: coordinates of the x-intercept

(0.625, 0)

* Show the substitution solution



4. $y = -4x$

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

This means 4 up / down

and over 1

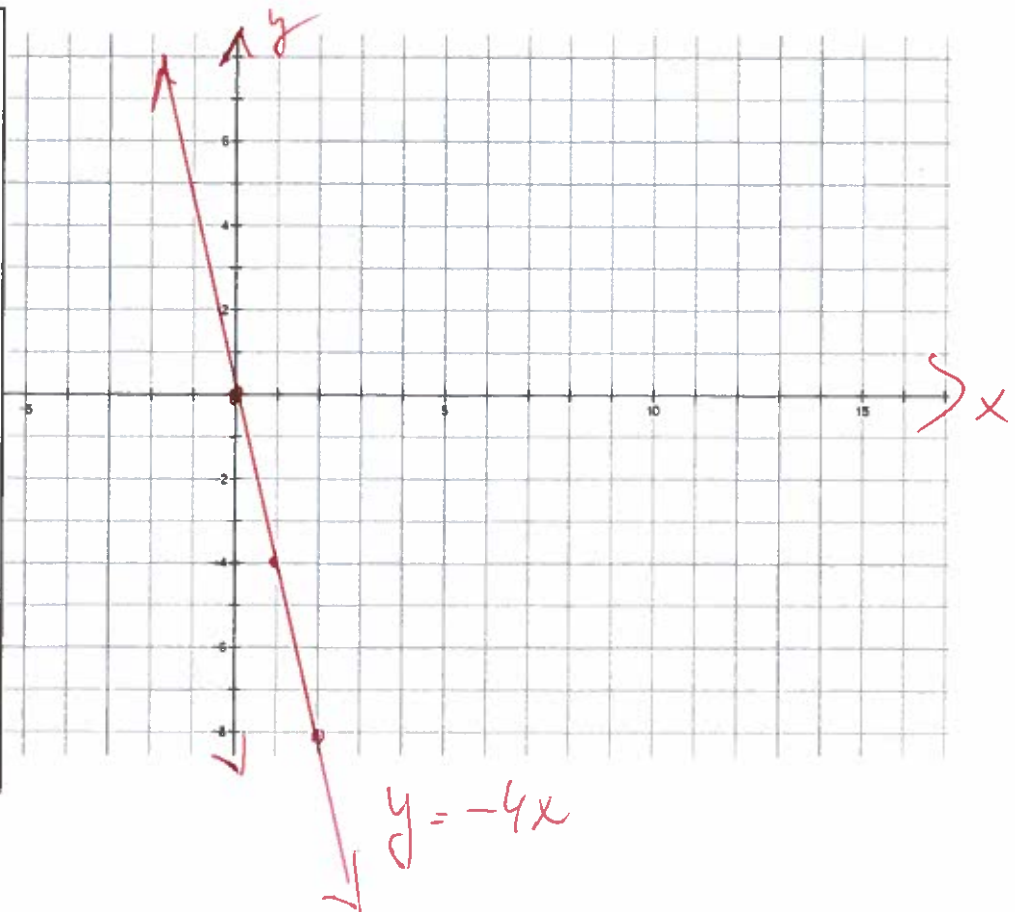
y-intercept = 0

coordinates of the y-intercept (0, 0)

The line is decreasing

BONUS: coordinates of the x-intercept

(0, 0)



5. Write the equation of the line graphed on the right.

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

Slope = $\frac{+2}{3}$

This means 2 up/down

and over 3

y-intercept = 5

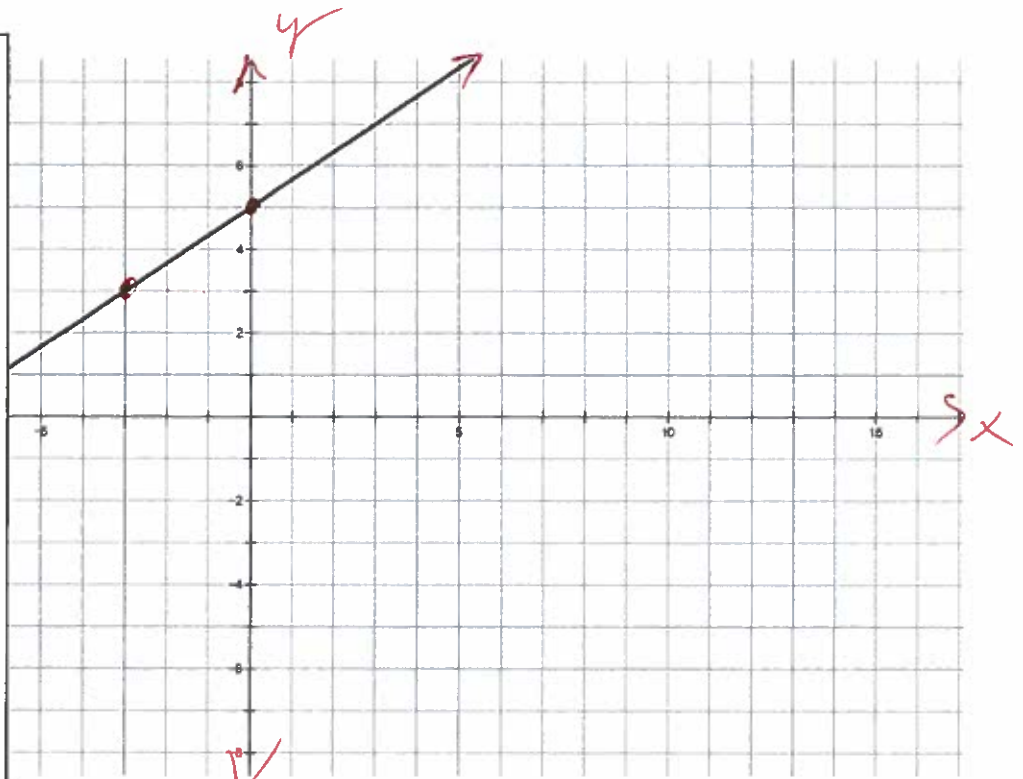
coordinates of the y-intercept (0, 5)

The line is increasing

BONUS: coordinates of the x-intercept

(-7.5, 0)

$y=0$



math:

$$0 = \frac{2}{3}x + 5 \rightarrow -5 = \frac{2}{3}x \rightarrow -15 = 2x \rightarrow x = -7.5$$

6. Write the equation of the line graphed on the left.

$$y = -5x - 9$$

Slope = _____

This means 5 up/down

and over 1

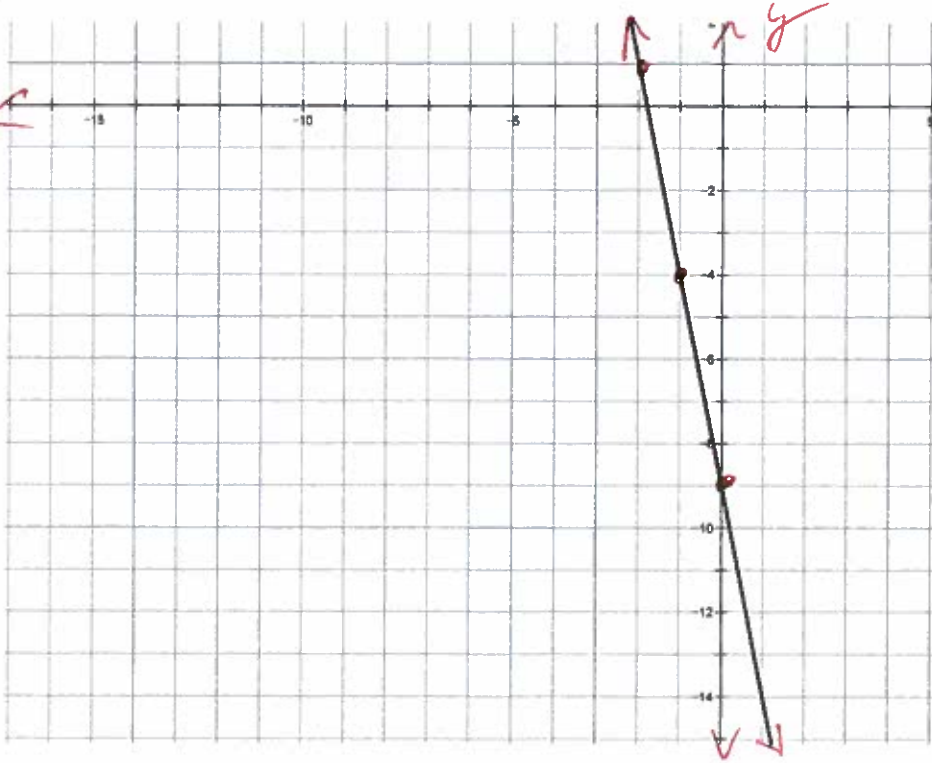
y-intercept = -9

coordinates of the y-intercept (0, -9)

The line is decreasing

BONUS: coordinates of the x-intercept

(-1.8, 0)

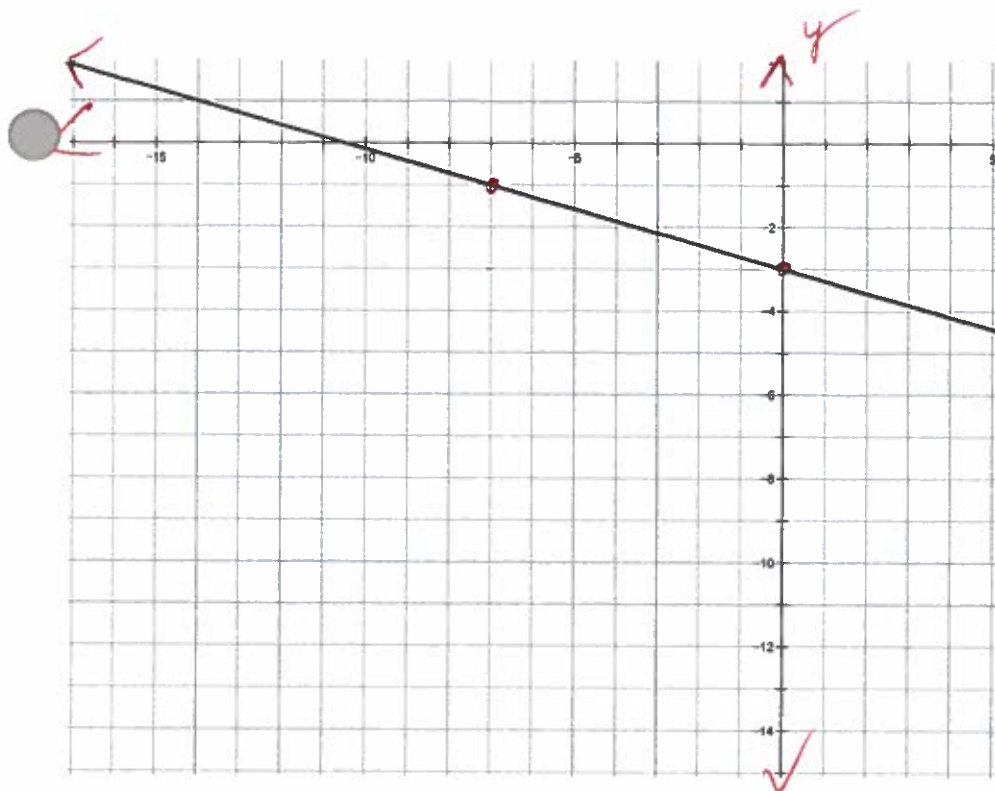


$$0 = -5(x) - 9$$

$$\frac{9}{5} = \frac{-5x}{5}$$

$$x = -\frac{9}{5}$$

$$x = -1.8$$



7. Write the equation of the line graphed on the left.

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

Slope = $-\frac{2}{7}$

This means 2 up/down

and over 7

y-intercept = -3

coordinates of the y-intercept (0 , -3)

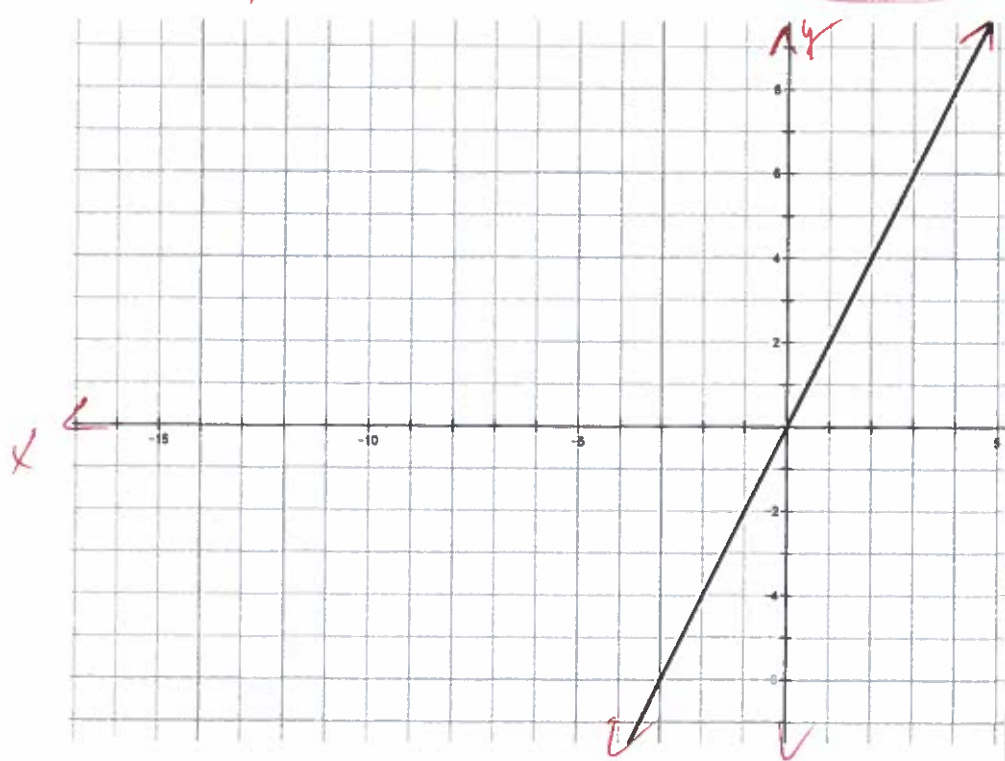
The line is decreasing

BONUS: coordinates of the x-intercept (11.5, 0)

$$0 = -\frac{2}{7}(x) - 3$$

$$3 = -\frac{2x}{7} \rightarrow 21 = -2x$$

$$x = -11.5$$



8. Write the equation of the line graphed on the left.

$$y = 2x$$

Slope = 2

This means 2 up/down

and over 1

y-intercept = 0

coordinates of the y-intercept (0 , 0)

The line is increasing

BONUS: coordinates of the x-intercept (0, 0)

"SPECIAL" LINES

9. $y = x$

Slope = 1

This means 1 up/down

and over 1

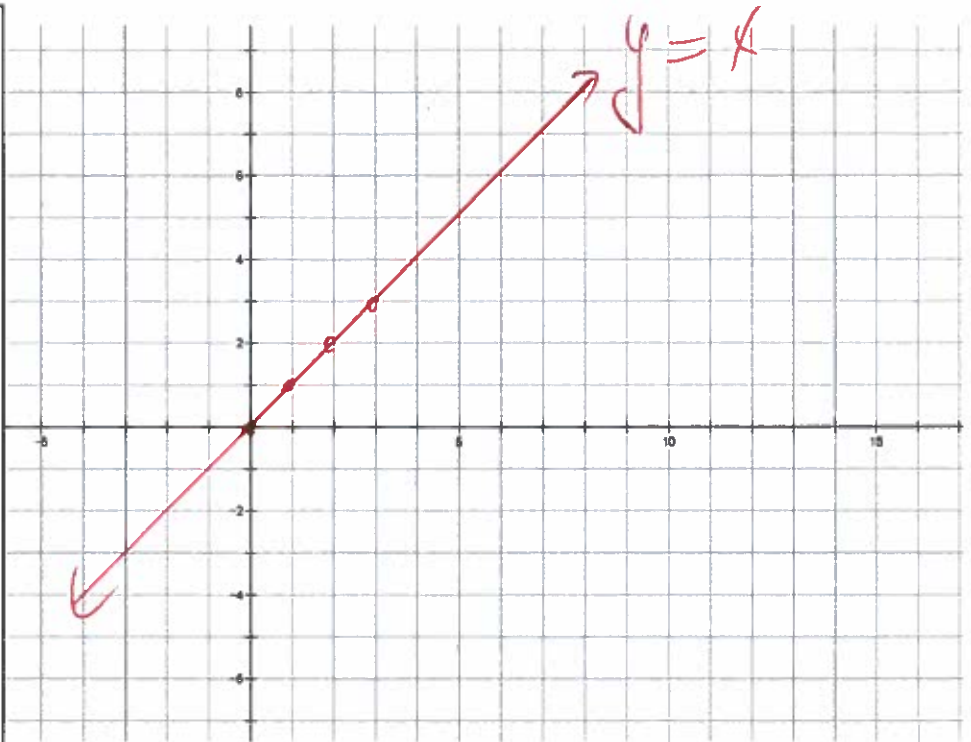
y-intercept = 0

coordinates of the y-intercept $(0, 0)$

The line is increasing

BONUS: coordinates of the x-intercept

$(0, 0)$



10. $y = -x$

Slope = -1

This means 1 up/down

and over 1

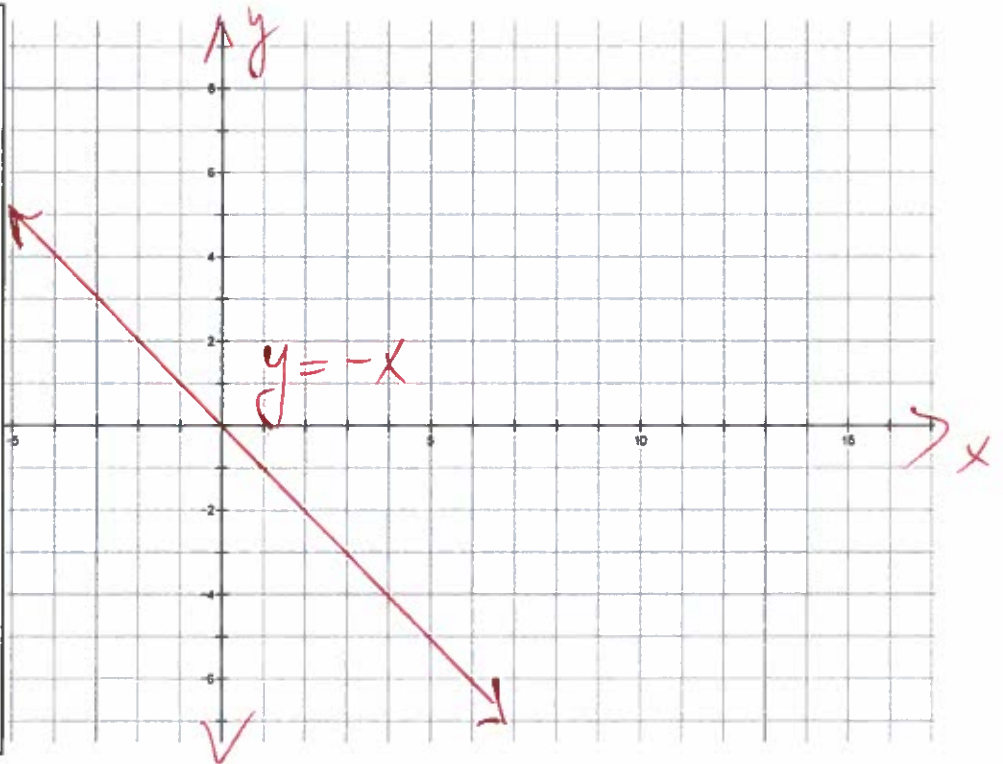
y-intercept = 0

coordinates of the y-intercept $(0, 0)$

The line is decreasing

BONUS: coordinates of the x-intercept

$(0, 0)$



11. $y = 4$

Slope = 0

This means 0 ~~up/down~~ *neither*

and over N/A

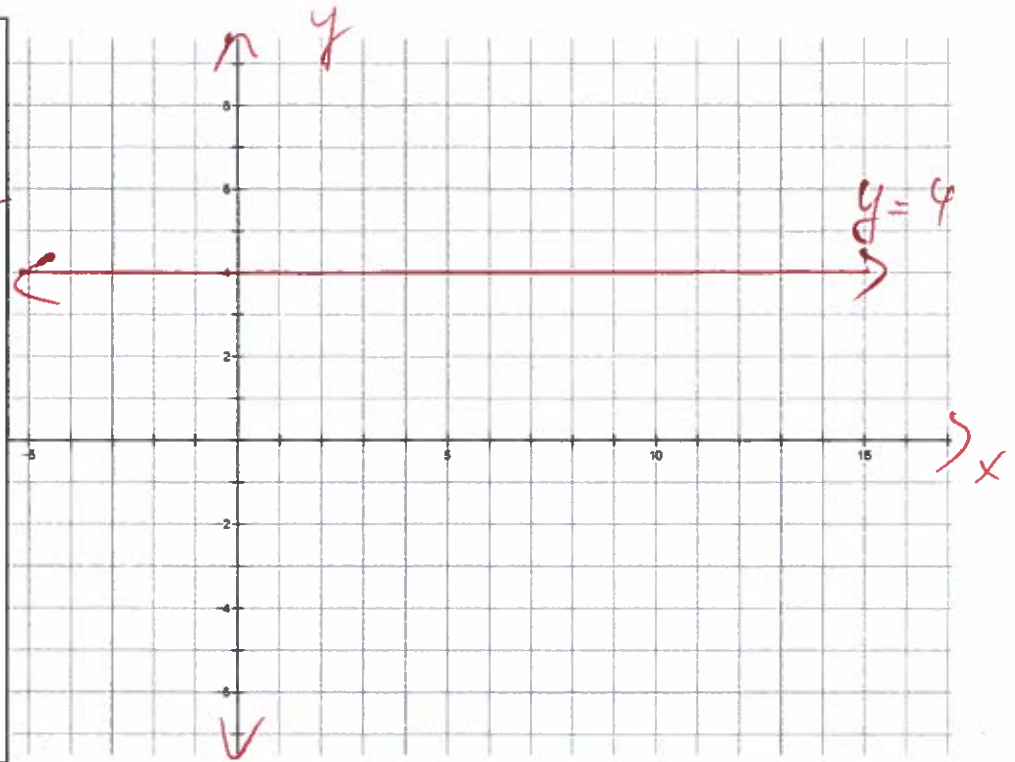
y-intercept = 4

coordinates of the y-intercept (0, 4)

The line is horizontal

BONUS: coordinates of the x-intercept

(~~X~~) N/A
no x-intercept



12. $y = -6$

Slope = 0

This means 0 ~~up/down~~ *neither*

and over N/A

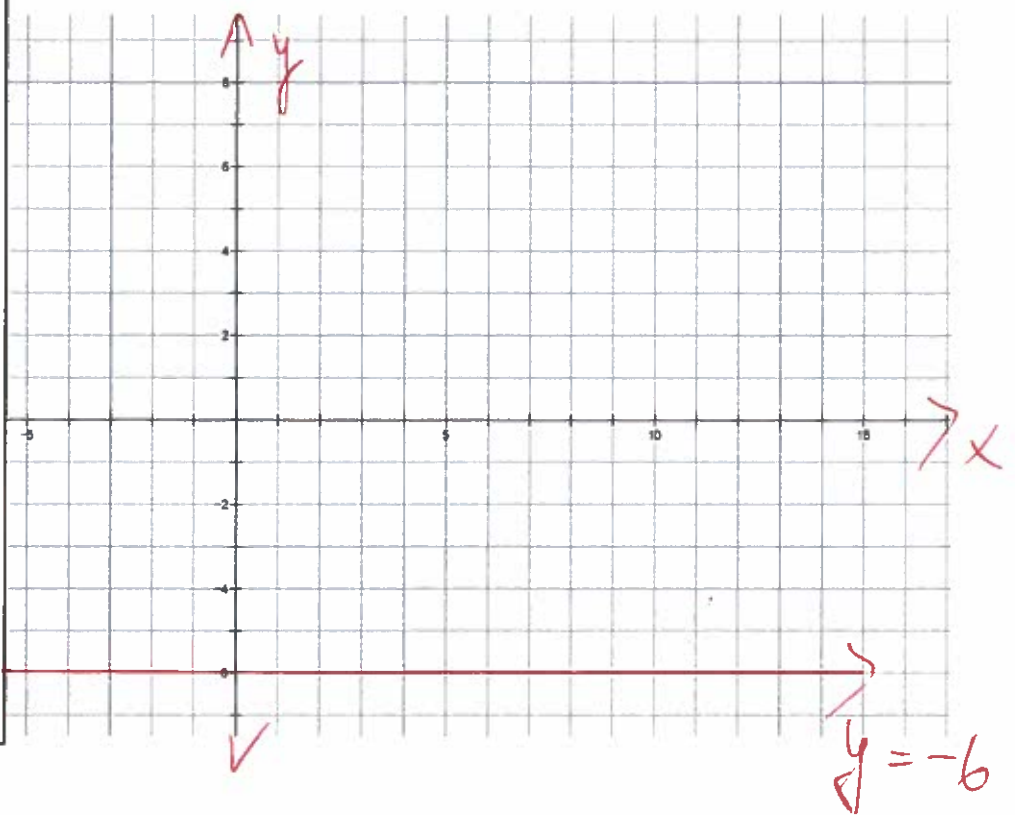
y-intercept = -6

coordinates of the y-intercept (0, -6)

The line is horizontal

BONUS: coordinates of the x-intercept

(~~X~~) N/A
no x-intercept



13. $x = 6$

Slope = infinite

This means ~~x~~ up/down ^{N/A}

and over ~~x~~

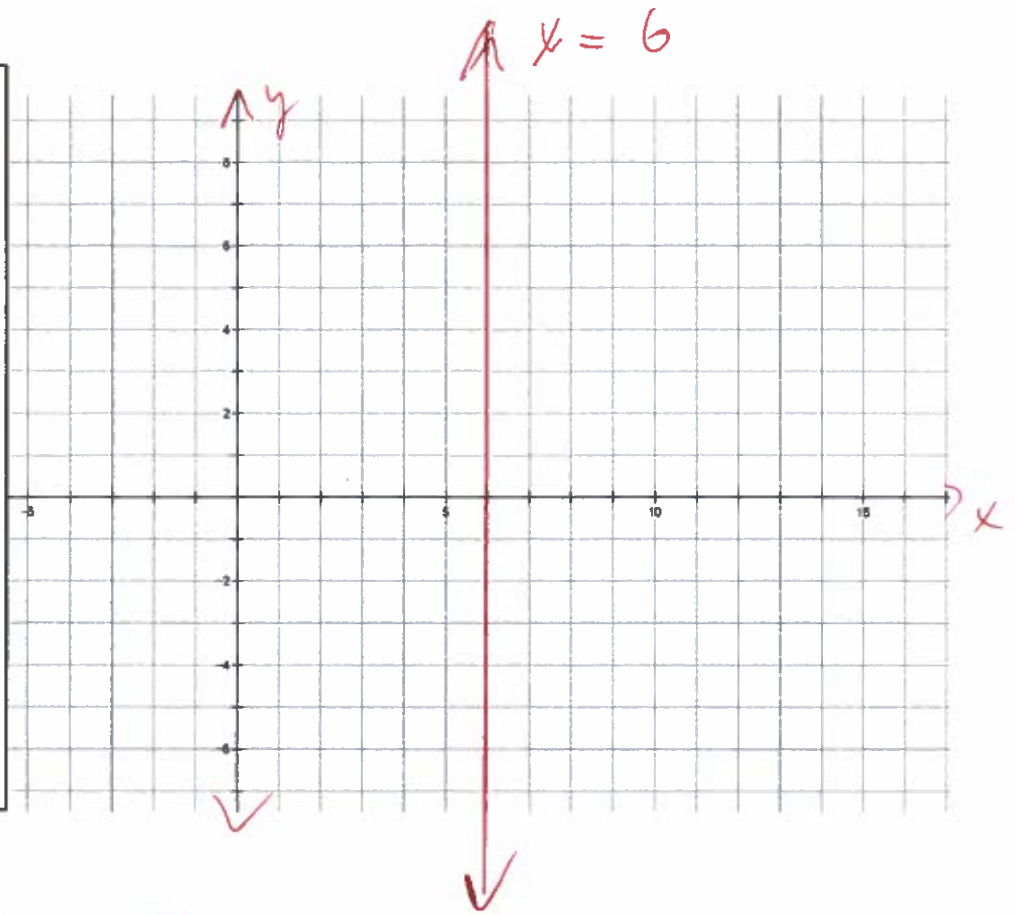
y-intercept = none

coordinates of the y-intercept (~~x~~)

The line is vertical

BONUS: coordinates of the x-intercept

(6, 0)



14. $x = -2$

Slope = infinite

This means ~~x~~ up/down ^{N/A}

and over ~~x~~

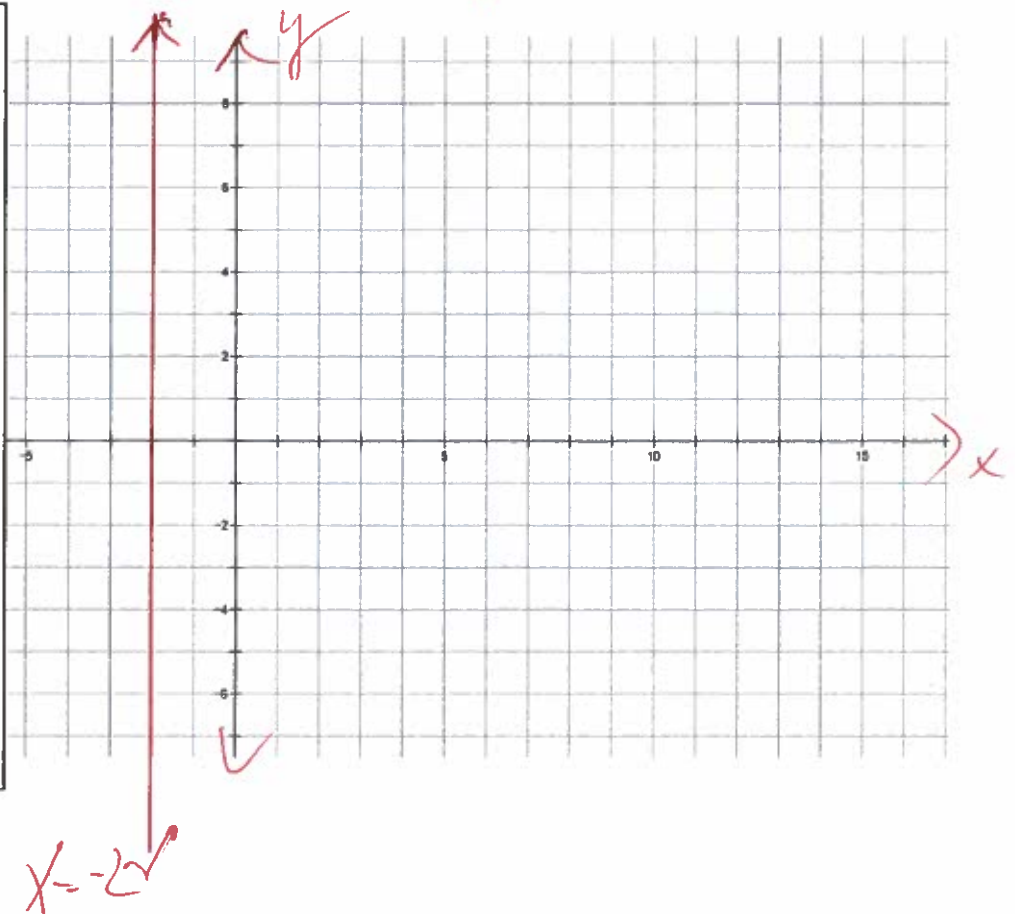
y-intercept = None

coordinates of the y-intercept (~~x~~)

The line is vertical

BONUS: coordinates of the x-intercept

(-2, 0)



14. Fill-in the blanks without graphing the line:

- a) Every decreasing line has a negative slope.
- b) A line with the equation $y = \frac{3}{5}x$ passes through the origin.
- c) A vertical line is said to have an infinite slope and its equation is in the form $x = \#$.
- d) A horizontal line has zero slope and its equation is in the form $y = \#$.
- e) Every horizontal line has only the y - intercept.
- f) Every vertical line has only the x - intercept.
- g) A line with the equation $y = -\frac{3}{46}x + 5$ goes down by 3 over 46.
- h) Any line whose x-intercept is equal to its y-intercept passes through the origin.

15. Circle the equation that gives a line that is steeper.

a) $y = \frac{12}{4}x + 5$ and $y = -\frac{18}{3}x + 1$

3 -6

d) $y = \frac{1}{4}x + 3$ and $y = -\frac{1}{3}x$

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

b) $y = \frac{12}{4}x + 5$ and $y = -\frac{21}{7}x + 1$

3 -3

same

e) $y = \frac{3}{4}x + 5$ and $y = -\frac{5}{4}x + 1$

$\frac{3}{4} < \frac{5}{4}$

c) $y = x + 7$ and $y = -3x + 1$

+1 -3

f) $y = \frac{8}{9}x + 15$ and $y = -\frac{160}{180}x + 1$

$\frac{8}{9} = \frac{160}{180}$

same

16. Using complete sentences, explain which method of graphing a line works better for you.