

Linear Functions and Slope-Intercept Form

$$\text{Slope is } m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

- 1) Using the slope formula, find the slope of the line through the given points.

$$(8,3) \text{ and } (5,9) \quad m = \frac{9-3}{5-8} = \frac{6}{-3} = -2$$

- 2) Find the slope of the line through the pair of points.

$$(7, -7) \text{ and } (-9,2) \quad m = \frac{2+7}{-9-7} = \frac{9}{-16}$$

Type equation here.

- 3) Write the equation of the line in slope-intercept form.

$$m = \frac{2}{7}, \text{ y-intercept } (0,6)$$

$$y = \frac{2}{7}x + 6$$

$$y = mx + b$$

- 4) Write the equation of the line in slope-intercept form.

$$m = \frac{3}{5}, \text{ y-intercept } (0,2) \quad y = \frac{3}{5}x + 2$$

- 5) Write the equation in slope-intercept form. Then find the slope and y-intercept of the line.

$$y = 8$$

Write the equation in slope-intercept form.

The slope of the line is . 0
(Type an integer or a simplified fraction.)

The y-intercept of the line is . (0,-7)
(Type an ordered pair. Use integers or fractions for an

Equation of a Horizontal Line

$y = a$ Slope is 0

Equation of a Vertical Line

$x = b$ Slope is undefined

- 6) Write the equation in slope-intercept form. Then find the slope and y-intercept of the line.

$$y = -7$$

Slope intercept form: $y = -7$

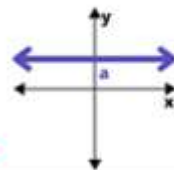
What is the slope of the line is 0

The y-intercept of the line is $(0, -7)$

Equation of a Horizontal Line

$$y = a$$

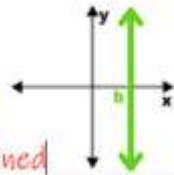
Slope is 0



Equation of a Vertical Line

$$x = b$$

Slope is undefined



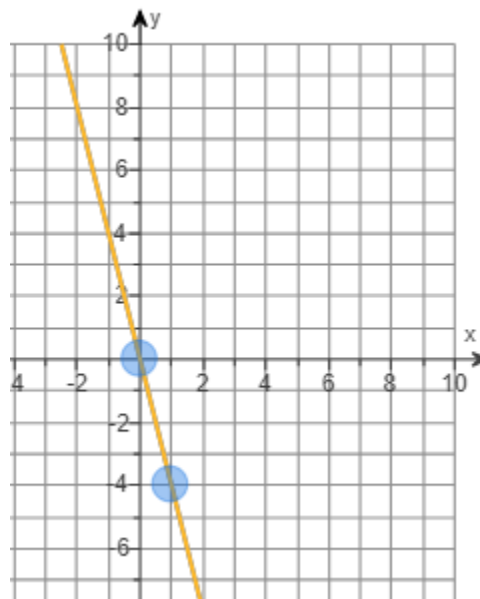
- 7) Graph the equation.

$$y = -4x + 0$$

Pick line graph

Plot the y-intercept 0

Then shift down 4 right 1

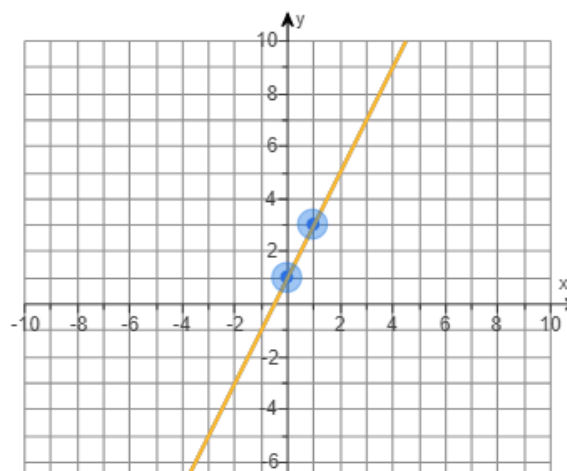


- 8) Use the slope-intercept form to graph the equation $y = 2x + 1$.

Pick line graph

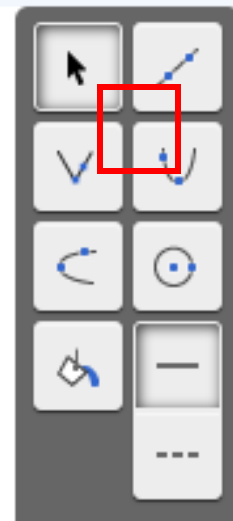
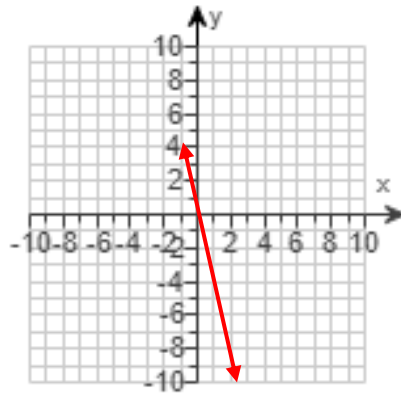
Plot the y-intercept 1

Then shift up 2 right 1



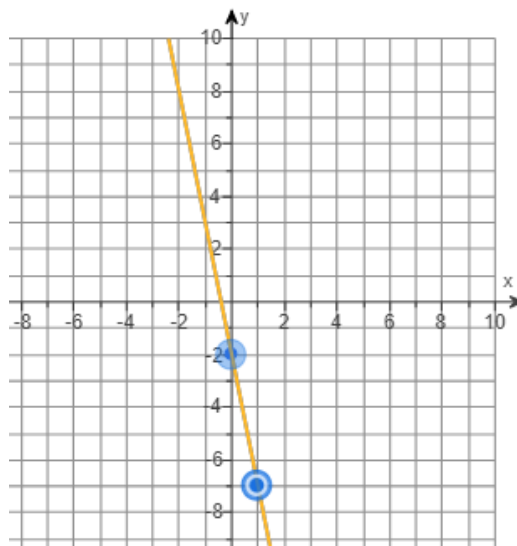
- 9) Use the slope-intercept form to graph the equation $y = -6x + 1$.

Pick line graph
 Plot the y-intercept 1
 Then shift down 6 right 1

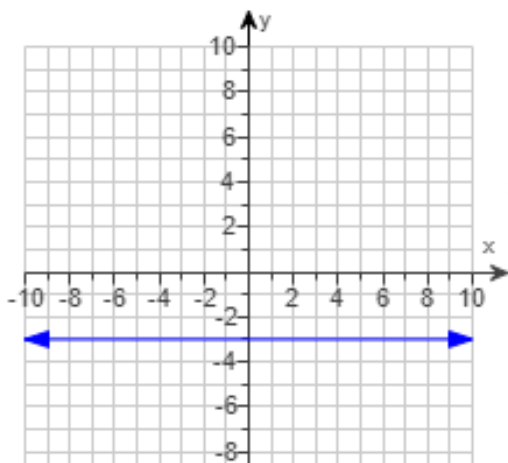


- 10) Use the slope-intercept form to graph the equation $y = -5x - 2$.

Pick line graph
 Plot the y-intercept -2
 Then shift down 5 right 1



- 11) Find the slope and y-intercept of the line shown below.



Equation of a Horizontal Line

$y = a$
 Slope is 0

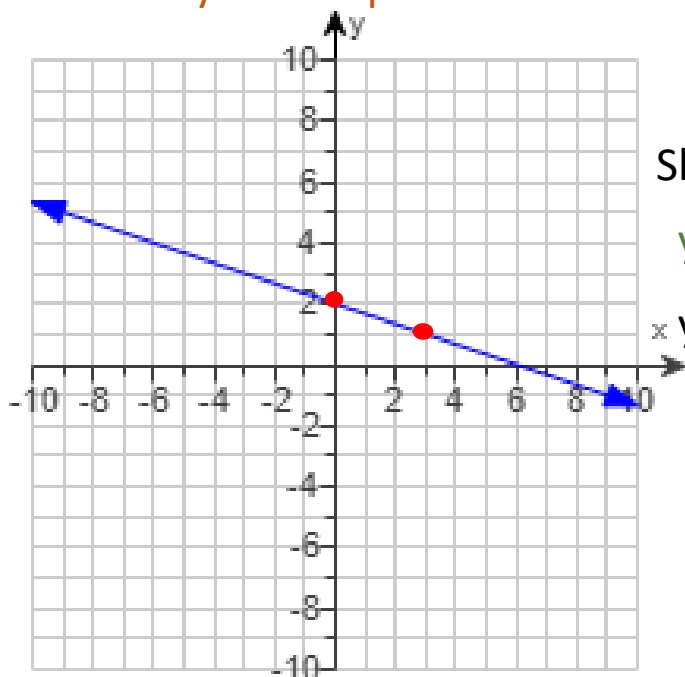
Equation of a Vertical Line

$x = b$
 Slope is undefined

Slope is 0 for a horizontal line
 y-intercept in ordered pair (0, -3)

12) Find the slope and y-intercept of the line shown below.

From y-intercept of 2: down 1 and right 3



Slope is $-\frac{1}{3}$ from point on the left,
you shift down 2 and right 6

y-intercept in ordered pair $(0, 2)$

$$\text{Slope is } m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

13) Using the slope formula, find the slope of the line through the given points.

$$(8, -9) \text{ and } (-1, -9) \quad m = \frac{2-2}{-9-6} = \frac{0}{-15} = 0$$

14) Write the equation of the line in slope-intercept form.

$$m = \frac{5}{6}, \text{ y-intercept } (0, 7)$$

$$y = \frac{5}{6}x + 7$$

$$y = mx + b$$

slope

y-intercept

15) Using the slope formula, find the slope of the line through the given points.

$$(3, 4) \text{ and } (6, 7) \quad m = \frac{7-4}{6-3} = \frac{3}{3} = 1$$

$$\text{Slope is } m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

16) Find the slope of the line through the pair of points.

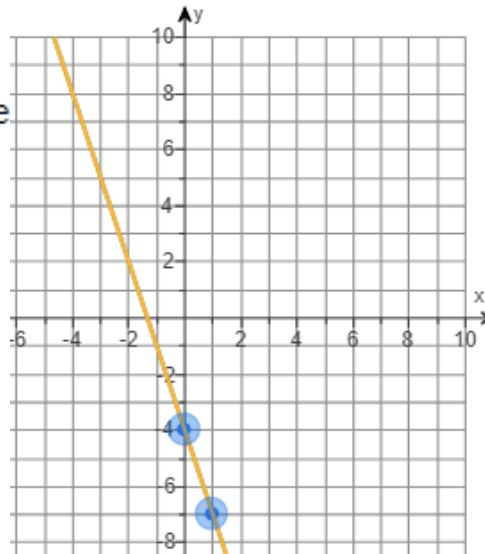
$$(10, -4) \text{ and } (6, 9) \quad m = \frac{9 - (-4)}{6 - 10} = \frac{13}{-4} = -\frac{13}{4}$$

17) Using the slope formula, find the slope of the line through the given points.

$$(7, 7) \text{ and } (2, 7) \quad m = \frac{7 - 7}{2 - 7} = \frac{0}{-5} = 0$$

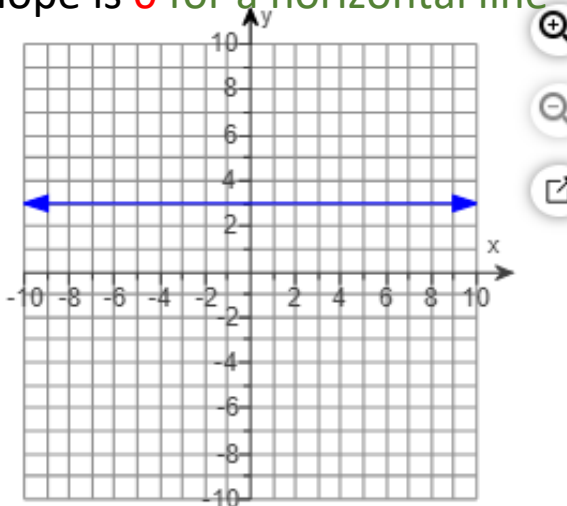
19) Use the slope-intercept form to graph the equation $y = -3x - 4$.

Pick line graph
Plot the y-intercept -4
Then shift down 3 right 1



20) Find the slope and y-intercept of the line shown below.

Slope is 0 for a horizontal line



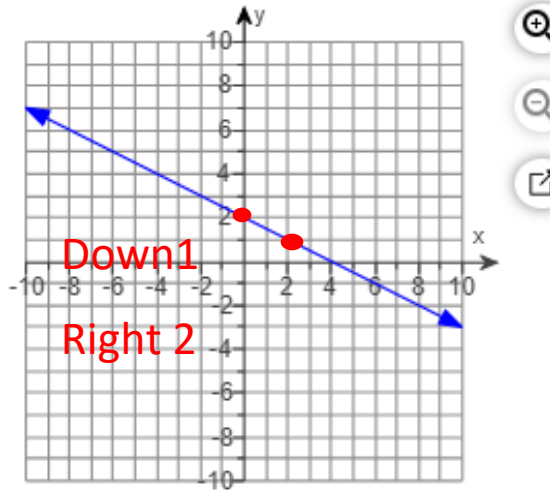
What is the slope? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The slope is 0.
(Type an integer or a simplified fraction.)
- B. The slope is undefined.

What is the y-intercept? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The y-intercept is (0, 3).
(Type an ordered pair.)
- B. There is no y-intercept.

- 21) Find the slope and y-intercept of the line shown below.



What is the slope? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The slope is $-\frac{1}{2}$.
(Type an integer or a simplified fraction.)

B. The slope is undefined.

What is the y-intercept? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The y-intercept is $(0, 2)$.
(Type an ordered pair.)

B. There is no y-intercept.

- 22) Find the slope and y-intercept of the graph of the equation.

$$y = 6x + 7$$

Select the correct choice and fill in any answer boxes in your choice below.

A. The slope is 6 .

B. The slope is undefined.

Select the correct choice and fill in any answer boxes in your choice below.

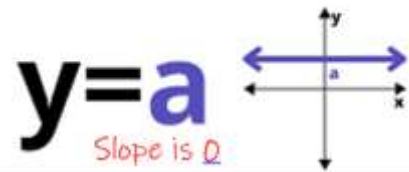
A. The y-intercept is 7 .

B. There is no y-intercept.

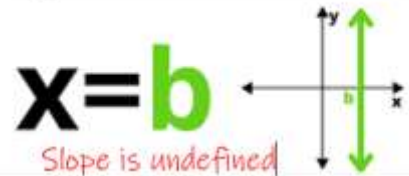
23) Find the slope and y-intercept of the graph of the equation.

$$y = 1$$

Equation of a Horizontal Line



Equation of a Vertical Line



Select the correct choice and fill in any answer boxes in you

A. The slope is .

B. The slope is undefined.

Select the correct choice and fill in any answer boxes in your choice below.

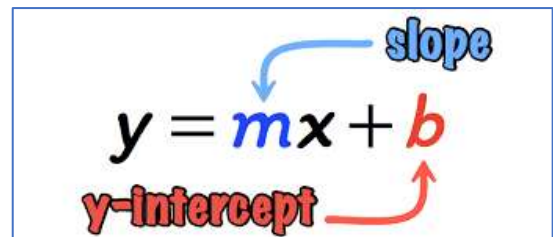
A. The y-intercept is .

B. There is no y-intercept.

24) Write an equation in slope-intercept form of the line with the given slope m and y-intercept b .

$$m = -3, b = \frac{7}{6}$$

$$y = \frac{5}{6}x + 7$$

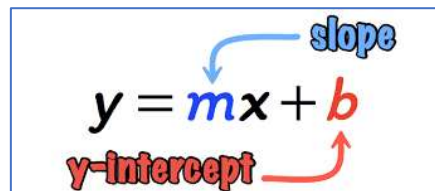


25) Write an equation of the line that passes through the given points.

(x, y)
 $(-3, 7)$ and $(4, 0)$

$$\text{Slope is } m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{0 - 7}{4 - (-3)} = \frac{-7}{7} = -1$$



$$7 = (-1)(-3) + b$$

$$7 = 3 + b$$

$$4 = b$$

$$y = -x + 4$$

26) Find an equation of the line containing the given pair of points.

(x,y)
(4,5) and (12,6)

$$\text{Slope is } m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{6-5}{12-4} = \frac{1}{8}$$

$$y = mx + b$$

slope (pointing to m)
y-intercept (pointing to b)

$$5 = (4)\left(\frac{1}{8}\right) + b$$

$$5 = \frac{1}{2} + b$$

$$5 - \frac{1}{2} = b$$

$$y = \frac{1}{8}x + \frac{9}{2}$$

27) Find an equation of the line containing the given pair of points.

(x,y)
(-6,0) and (0,1)

$$\text{Slope is } m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{1-0}{0-(-6)} = \frac{1}{6}$$

$$y = mx + b$$

slope (pointing to m)
y-intercept (pointing to b)

$$0 = (-6)\left(\frac{1}{6}\right) + b$$

$$0 = -1 + b$$

$$1 = b$$

$$y = \frac{1}{6}x + 1$$

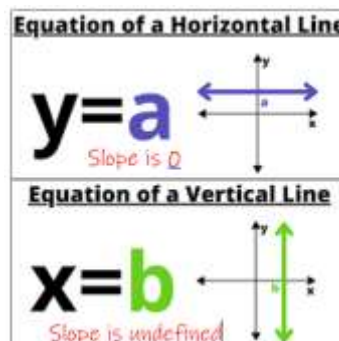
28) Write an equation in standard form of the line passing through the given pair of points.

The line goes through the points (3,4) and (3,3).

What is the equation of the line? (x,y)

$$m = \frac{3-4}{3-3} = \frac{-1}{0} = \text{undefined}$$

- A. $y = 4$
- B. Undefined
- C. $x + y = 4$
- D. $x = 3$



29) Find an equation of the line containing the given pair of points.

(x,y)
(-4,0) and (0,7)

$$m = \frac{7-0}{0-(-4)} = \frac{7}{4}$$

$$y = mx + b$$

slope ↖
y-intercept ↗

$$0 = (-4)\left(\frac{7}{4}\right) + b$$

$$0 = -7 + b$$

$$7 = b$$

$$y = \frac{7}{4}x + 7$$

30) Write an equation in standard form of the line passing through the given pair of points.

The line goes through the points (4,1) and (4,5).

(x,y) $m = \frac{5-1}{4-4} = \frac{4}{0} = \text{undefined}$

What is the equation of the line?

- A. $x + y = 1$
- B. $x = 4$
- C. $y = 1$
- D. Undefined

Equation of a Horizontal Line

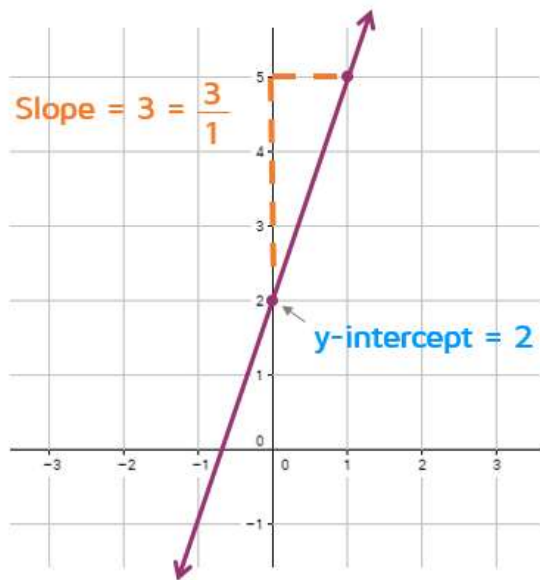
$y = a$
Slope is 0

Equation of a Vertical Line

$x = b$
Slope is undefined

PLOTTING EXAMPLE

Graph of $y = 3x + 2$



Plot y-intercept on the y-axis first

From the point shift up 3 and right 1 using the slope

If slope is positive shift up

If slope is negative shift down

Always shift to the right after