

Equations for a Line

- Slope-Intercept Form $y = mx + b$
- Standard Form $Ax + By = C$
- Point-Slope Form $y - y_1 = m(x - x_1)$

1. The line has a slope of $-\frac{4}{3}$ and passes through the point $(-6, 14)$

EQ:

$$y = -\frac{4}{3}x + 6$$

$$y - y_1 = m(x - x_1)$$

$$y - 14 = \frac{4}{3}(x + 6)$$

$$y - 14 = \frac{4}{3}x + 8$$

$$y = \frac{4}{3}x + 22$$

$$y = -\frac{4}{3}x + b$$

$$14 = -\frac{4}{3}(-6) + b$$

$$14 = 8 + b$$

$$b = 6$$

2. The line passes through the points $(15, -3)$ & $(25, 1)$

EQ:

$$y - y_1 = m(x - x_1)$$

$$m = \frac{1 - (-3)}{25 - 15} = \frac{4}{10} = \frac{2}{5}$$

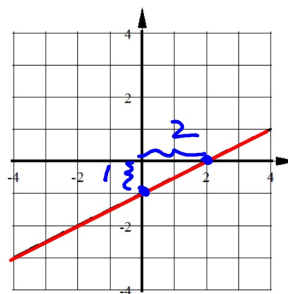
$$y - 1 = \frac{2}{5}(x - 25)$$

$$y - 1 = \frac{2}{5}x - 10$$

$$y = \frac{2}{5}x - 9$$

3. Use the line in the graph.

EQ:



$$y = mx + b$$

rise
run

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

y axis

4. $12x - 8y = 48$

EQ:

$$\begin{array}{r} -12x \quad -12x \\ -8y = -12x + 48 \\ \hline -8y = -12x + 48 \\ \hline y = \frac{3}{2}x - 6 \end{array}$$

When slope-intercept models a real situation

$$y = mx + b$$

Slope:
Rate of Change
in the situation

y-intercept:
Initial amount

5. A pool has 400 gallons of water in it and the owner puts the hose in the pool. Water comes out of the hose at a rate of 3.5 gallons per minute.

a) Write an equation to model this situation.

$$y = 3.5x + 400$$

$y = \text{gal of water}$
 $x = \text{time}$

b) Use this equation to predict the amount of time it will take until the pool has 1000 gallons of water.

$$\begin{aligned} 1000 &= 3.5x + 400 \\ 600 &= 3.5x \\ x &\approx 171.43 \text{ min} \end{aligned}$$

Hwk #38 Review Answers:

IMPORTANT INFORMATION THAT I WILL NEED FOR THE QUIZ!!!!

Slope is equal to rise over run

The Slope equation is $m = \frac{y_2 - y_1}{x_2 - x_1}$

Slope-Intercept form looks like: $y = mx + b$

"m" stands for the slope and "b" stands for the y int

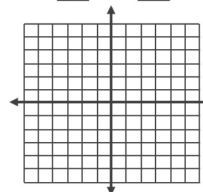
and the y-intercept is where my line crosses the y-axis

Point-Slope form looks like: $y - y_1 = m(x - x_1)$

Graph a linear function.

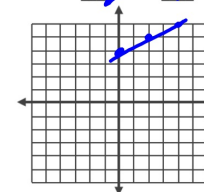
1. $f(x) = 3x - 1$

$m = \underline{\quad}$ $b = \underline{\quad}$



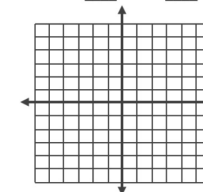
2. $g(x) = \frac{1}{2}x + 4$

$m = \underline{\frac{1}{2}}$ $b = \underline{4}$



3. $h(x) = -4x - 5$

$m = \underline{\quad}$ $b = \underline{\quad}$



Write the equation of the line described below in slope-intercept form.

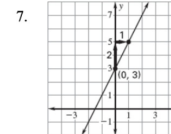
4. $m = 6$, $b = -2$

5. $m = \frac{1}{2}$, $b = 3$

6. $m = -5$, $b = 9$

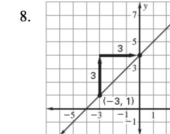
$y = \frac{1}{2}x + 3$

Identify the slope and y-intercept of the line. Then write the equation in slope-intercept form.



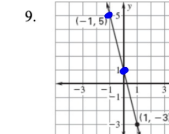
$m = \underline{\quad}$ $b = \underline{\quad}$

equation: $\underline{\hspace{2cm}}$



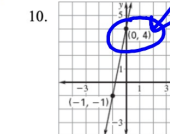
$m = \underline{\quad}$ $b = \underline{\quad}$

equation: $\underline{\hspace{2cm}}$



$m = \underline{-4}$ $b = \underline{1}$

equation: $y = -4x + 1$



$m = \underline{5}$ $b = \underline{4}$

equation: $y = 5x + 4$

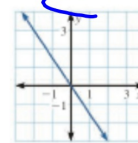
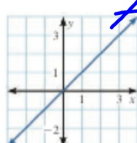
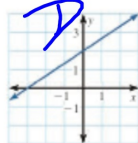
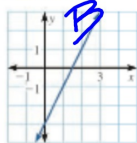
11. Give the letter of the equation that matches the graph.

A. $y = x$

B. $y = 2x - 3$

C. $y = -x$

D. $y = \frac{2}{3}x + 2$



Write the equation of the line in Point-Slope Form.

12. $(-1, 6); m = 5$

13. $(-4, -9); m = 2$

14. $(2, -3); m = 7$

15. $(-8, 1); m = -\frac{3}{4}$

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 6 &= 5(x + 1) \\ y - 1 &= -\frac{3}{4}(x + 8) \end{aligned}$$

Write in point-slope form the equation of the line that passes through the given point and has the given slope. Then rewrite the equation in slope-intercept form.

16. $(10, 3); m = -2$

17. $(8, 6); m = \frac{1}{2}$

$$\begin{aligned} y - 3 &= -2(x - 10) \\ y - 3 &= -2x + 20 \\ y &= -2x + 23 \end{aligned}$$

point-slope form

18. $(-9, 6); m = \frac{1}{3}$

19. $(3, 4); m = 0$

$$\begin{aligned} m &= 0 \\ y &= \\ x &= \end{aligned}$$

$$\begin{aligned} y - 4 &= 0(x - 3) \\ y - 4 &= 0 \\ y &= 4 \end{aligned}$$

point-slope form

point-slope form

IXL #15 - S.4 & S.21 due tomorrow by 6pm!

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad y = mx + b$$
$$y - y_1 = m(x - x_1)$$