

Day 27

Part 1

3-6 Lines in the Coordinate Plane

$$m = \text{Slope} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{rise}}{\text{run}}$$

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

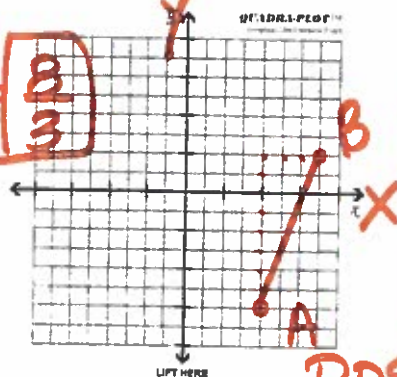
Find the slope, using rise/run

1. $A(4, -6)$ $B(7, 2)$ 2. $A(-3, 7)$ $B(-1, 4)$

down
left

$$-\frac{8}{-3} = \frac{8}{3}$$

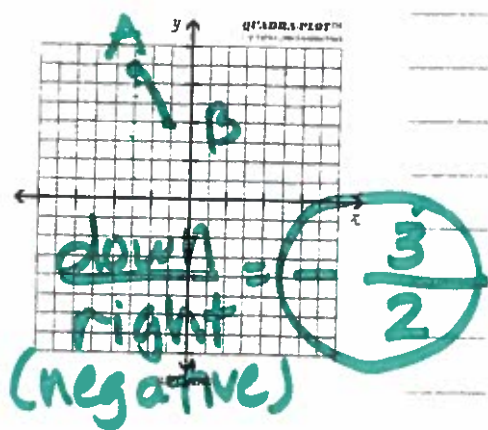
$$\frac{8}{3}$$



up 8
right 3

$$m = \frac{8}{3}$$

positive

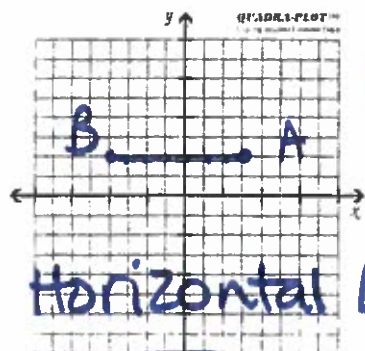


down
right

$$-\frac{3}{2}$$

(negative)

3. $A(3, 2)$ $B(-4, 2)$ 4. $A(-5, 1)$ $B(-5, 4)$

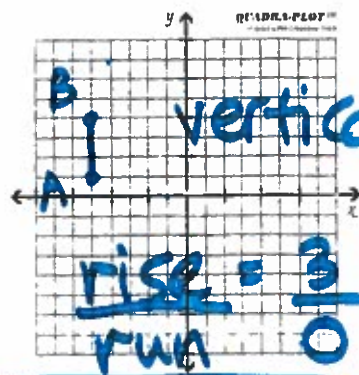


Horizontal Line

$$m = 0$$

$$0 \div 7 = 0$$

$$\frac{\text{no rise}}{\text{run}} = \frac{0}{7}$$



vertical

$$\frac{\text{rise}}{\text{run}} = \frac{3}{0}$$

$m = \text{NO slope}$
or undefined

Find the slope using $m = \frac{y_2 - y_1}{x_2 - x_1}$

5. $\begin{matrix} x_1 & y_1 & x_2 & y_2 \\ (7, -6) & & (-5, -8) \end{matrix}$

$$m = \frac{-8 - (-6)}{-5 - 7} = \frac{-8 + 6}{-5 - 7} = \frac{-2}{-12} = \frac{1}{6}$$

6. $\begin{matrix} x_2 & y_2 & x_1 & y_1 \\ (-1.4, -3.7) & & (-2.4, 1.3) \end{matrix}$

$$m = \frac{-3.7 - 1.3}{-1.4 - (-2.4)} = \frac{-5}{-1} = \frac{-5}{1} = -5$$

Graph a line with the given slope, and point

Plot Point 1st

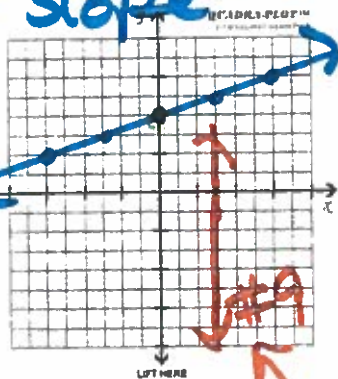
Plot 1st

7. $m = \frac{1}{3}$, $P(0, 4)$

8. $m = -2$, $P(2, -3)$

Positive slope

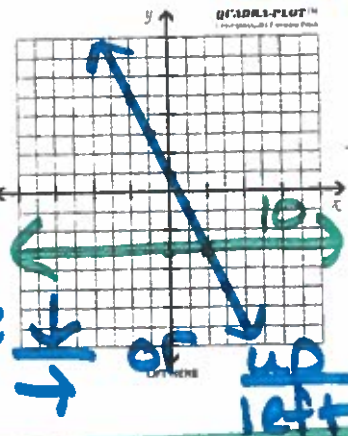
$\frac{1}{3}$ up
3 right
or
down
left



slope

$$m = -\frac{2}{1}$$

Negative



$\frac{1}{2}$ or $\frac{2}{1}$ left

9. m is undefined
 $P(3, -1)$

vertical line

10. $m = 0$, $P(0, -3)$

Horizontal line

3 Forms of a Line

$m = \text{slope}$
 $b = \text{y-intercept}$

1. Slope - Intercept

$$y = mx + b$$

2. Point - Slope

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

3. Standard :

$$Ax + By = C$$

★ Use $y = mx + b$, when you know the slope and the y-intercept.
(m) (b)

The eq. must always be solved for "y" first.

If an eq. only has an "x", it is a vertical line.

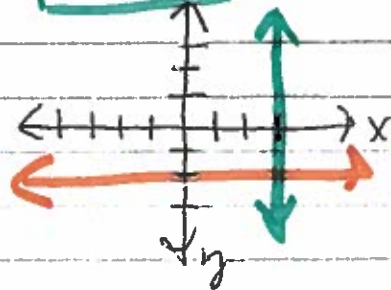
(ex)

$$x = 3$$

If an eq. only has a "y", it's a horizontal line.

(ex)

$$y = -2$$



Graph each line.

$$\textcircled{1} \quad \frac{1}{2}y = \frac{8x}{2} - \frac{2}{2}$$

$$y = 4x - 1$$

Slope: $m = 4$ rise
y-intercept = $b = -1$ run

$$\textcircled{2} \quad 3x + 9y = 18$$

$$\begin{array}{r} -3x \\ \hline 9y = -3x + 18 \\ \frac{1}{9}y = -\frac{3x}{9} + \frac{18}{9} \end{array}$$

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

Slope: $m = -\frac{1}{3}$ $b = 2$

③ $x = -2$ vertical ④ $5 - y = \frac{3}{4}x$

⑤ $y = 1x$ $m = 1$ $b = 0$

⑥ $x + y = -1$ ⑦ $y = 5$ Horizontal

⑧ $\frac{1}{3}x = \frac{1}{2}y + 1$ $\frac{1}{3}y = \frac{2}{3}x + 1.2$
 $y = \frac{2}{3}x + 2$

45. **Hourly Wages** The equation $P = \$3.90 + \$0.10x$ represents the hourly pay (P) a worker receives for loading x number of boxes onto a truck.
- What is the slope of the line represented by the given equation?
 - What does the slope represent in this situation?
 - What is the y-intercept of the line?
 - What does the y-intercept represent in this situation?

46. **Inclines** The Blackberrys' driveway is difficult to get up in the winter ice and snow because of its slope. What is the equation of the line that represents the Blackberrys' driveway?

