

Algebra 2

Unit 0 Lesson 2: Slope and Lines (Slope-Intercept Form)

- Find slope given...
 - > Graph of a Line
 - > Two points on the same line
 - > Line in Slope-Intercept form
- Find Equation of a line given two points

Finding the Slope given a graph:

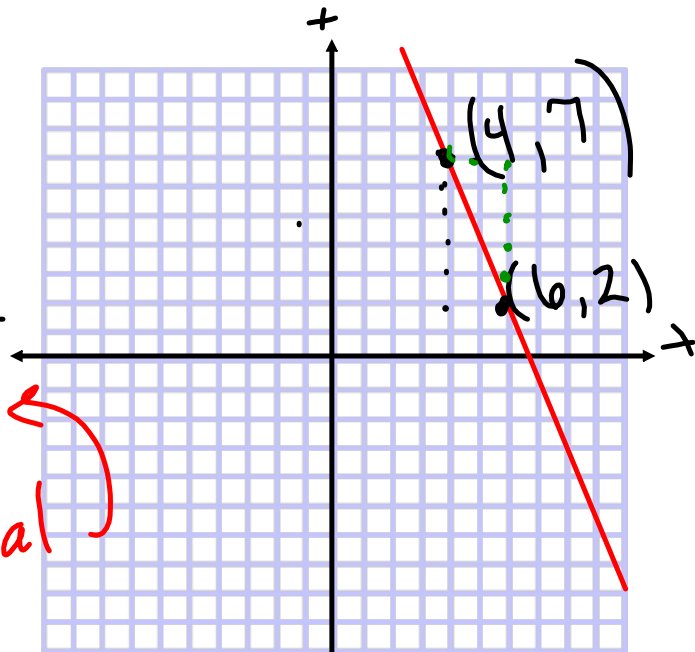
↑ ↓ · rise
↖ ↗ · run

Ex 1:

$$\frac{-5}{2} \quad \frac{5}{-2}$$

these are both equal

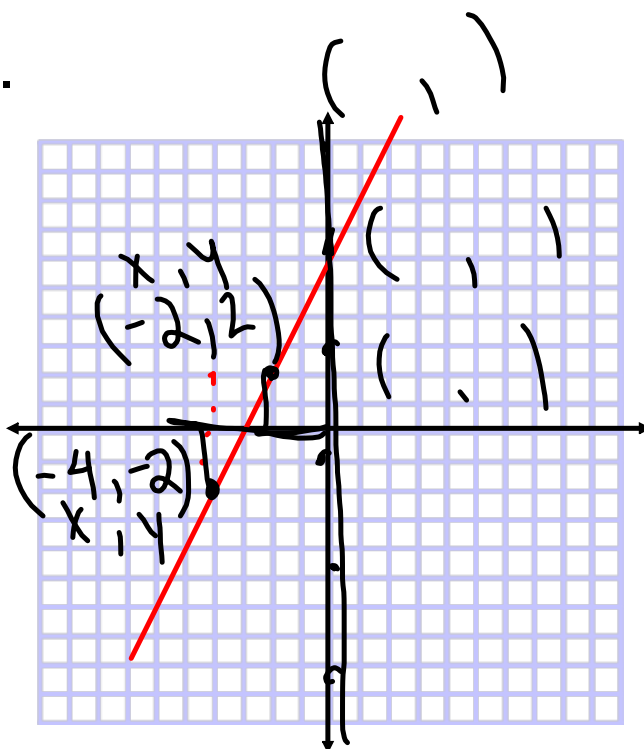
$$-\frac{5}{2} = \frac{5}{-2} = \frac{5}{-2}$$



Ex 2: State the slope.

$$\frac{\text{rise } \uparrow 4}{\text{run } \rightarrow 2}$$

$$\frac{4}{2} = \boxed{2}$$



Find Slope given two points:

$$\begin{array}{c} \text{1st} \\ (x_1, y_1) \end{array} \& \begin{array}{c} \text{2nd} \\ (x_2, y_2) \end{array} \quad \frac{y_2 - y_1}{x_2 - x_1} = m$$

- Ex 3: Find the slope of the line that passes through $(9, -1)$ & $(2, -1)$.

$$\frac{-1 - (-1)}{2 - 9} = \frac{-1 + 1}{-7} = \frac{0}{-7} = 0$$

Ex 4: Find the slope of the line that passes through $(-4, 1)$ & $(6, -5)$

$$x_1 \quad y_1 \quad x_2 \quad y_2$$

$$\cdot \frac{-5 - 1}{6 - -4} = \frac{-6}{10} = -\frac{3}{5}$$

$$\cdot \frac{1 - -5}{-4 - 6} = \frac{6}{-10} = -\frac{3}{5}$$

Finding Slope given an equation in Slope-Intercept form.

$$y = mx + b$$

slope

y-intercept

· Ex 5: $y = \frac{1}{2}x - 4$

m: $\frac{1}{2}$

y-int: $(0, -4)$

Ex 6: $y = -3x + \frac{4}{5}$

m: -3

y-int: $(0, \frac{4}{5})$

· Ex 7: $y = 0.01x + 34.85$

m: 0.01

y-int: $(0, 34.85)$

Ex 8: $y = \sqrt{\frac{34}{5}} \cdot x - 67$

m: $\sqrt{\frac{34}{5}}$

y-int: $(0, -67)$

Steps to write an equation of a line:

- 1. Find Slope
- 2. Plug a point and the slope into slope-intercept form and solve for b.
- 3. Write an equation with the slope and y-intercept you found.

Ex 9: Write the equation of the line that passes through (12, 7) & (10, -1)

Step 1: Find Slope

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 7}{10 - 12} = \frac{-8}{-2} = 4$$

Step 2: $m = 4$ $y = mx + b$

$$7 = 4(12) + b$$

$$7 = 48 + b$$

$$-48 \quad -48$$

$$-41 = b$$

Step 3: $y = mx + b$

$$\boxed{y = 4x - 41}$$

Ex 10: Find the equation of the line that passes through (5, 3) and has a slope of 1

1. Find Slope: ... $m = 1$

2. plug in point & slope

$$y = mx + b$$

$$3 = 1(5) + b$$

$$3 = 5 + b$$

$$\begin{array}{r} -5 \\ -5 \end{array}$$

$$-2 = b$$

Answer

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