

☺ 3.2 – Revisiting Slope ☺

Daily Objectives:

1. Deepen understanding of slope
2. Define domain and range
3. Define slope formulas and intercept form for lines

Slope

The formula for the slope between two points, (x_1, y_1) and (x_2, y_2) , is

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} \text{ where } x_1 \neq x_2$$

The slope of a line will be the **SAME** for any two points selected from that line!

Example 1: Find the slope between the following points:

a. $(1, 5)$ $(4, 10)$

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 5}{4 - 1} = \frac{5}{3}$$

b. $(-3, 9)$ $(4, -7)$

$$\frac{-7 - 9}{4 - (-3)} = \frac{-16}{7} = -\frac{16}{7}$$

Intercept Form of the Equation of a Line

You can write the equation of a line as

$$y = a + bx$$

where a is the y -intercept and b is the slope of the line.

You may have also seen Intercept Form written as $y = mx + b$. They represent the same equation. What is **IMPORTANT** is that the **SLOPE** is always the coefficient of the x .

Example 2: Identify the slope and y -intercept from the following equations:

a. $y = 5 + 3x$

$$m = 3$$

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

b. $y = 4.5x - 8$

$$m = 4.5$$

$$y\text{-int: } (0, -8)$$

Example 3: Given the slope and y-intercept, write the linear equation:

a. (0, 9); slope = 1.5

$$y = 9 + 1.5x$$
$$y = 1.5x + 9$$

b. (0, -3); slope = $\frac{1}{2}$

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

Example 4: Given two points, write the linear equation:

a. (0, 6) (4, 9)

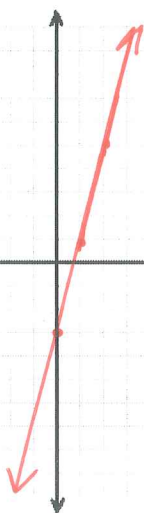
$$m = \frac{9-6}{4-0} = \frac{3}{4}$$
$$y = \frac{3}{4}x + 6$$

b. (0, -2) (-4, 12)

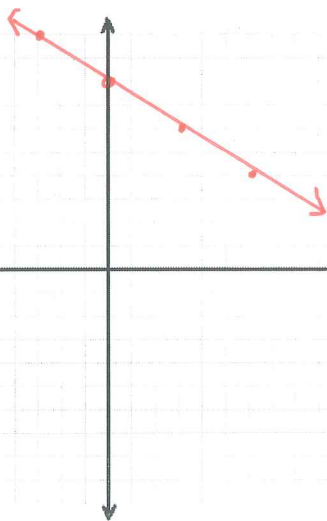
$$m = \frac{12 - (-2)}{-4 - 0} = \frac{14}{-4} = -\frac{7}{2}$$
$$y = -\frac{7}{2}x - 2$$

Example 5: Graph the following equations:

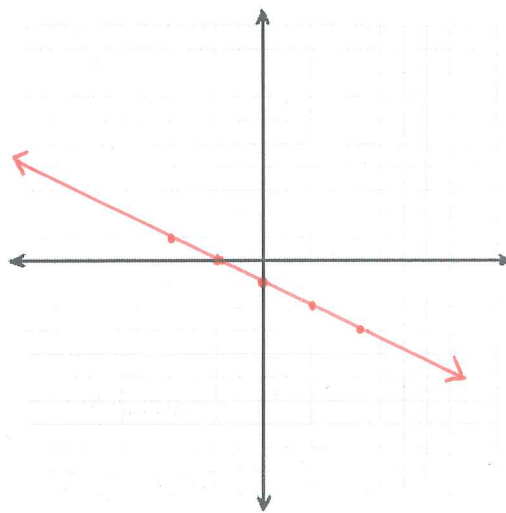
a. $y = 4x - 3$



b. $y = 8 - \frac{2}{3}x$



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

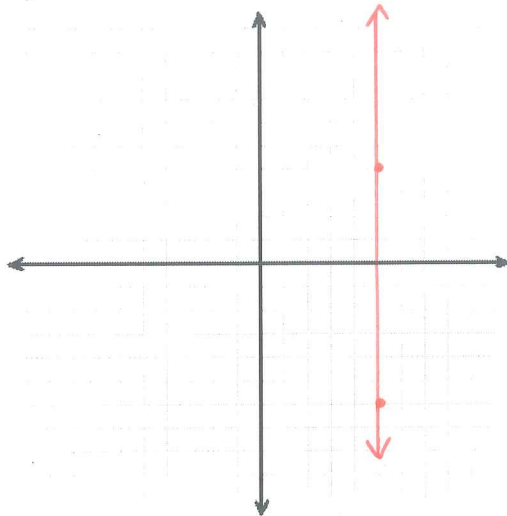


Example 6: Find the slope between the two points. Then graph the line:

a. (5, 4) (5, -6)

$$\frac{-6-4}{5-5}$$
$$\frac{-10}{0}$$

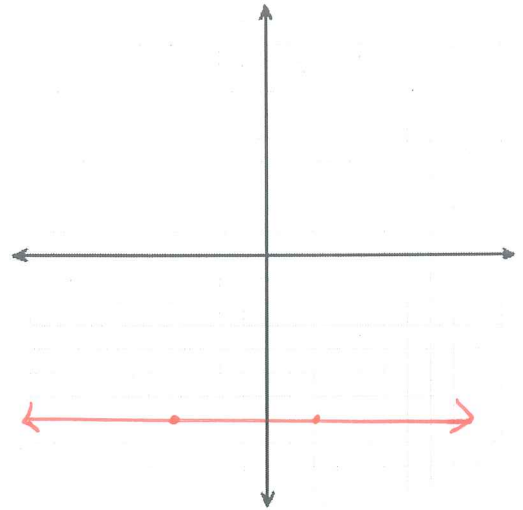
undefined
or
no slope



b. (2, -7) (-4, -7)

$$\frac{-7--7}{-4-2}$$
$$\frac{0}{-6}$$

$m=0$



X = # lines always graph vertical lines.

Y = # lines always graph horizontal lines.

Dependent Variable: A variable whose value depends on the values of another variable.

Dependent variables are always on the x - axis.

Independent Variable: A variable whose values do not depend on another variable.

Independent variables are always on the y - axis.

Domain: Set of input values. The domain represents the possible x- values.

Range: Set of output values. The range represents the possible y- values.