Slope and Graphing Using Slope – Intercept Form

4.4: Slope

- Be able to find the slope of the line that passes through a pair of points. Also be able to identify when it is zero vs. undefined.

Ex: (–2, –1) and (4, 5)

$m = 1$

Ex: (3, –2) and (3, 6)

$m = $ Undefined

Ex: (–10, –2) and (–8, 8)

$m = 5$

Ex: (–9, 1) and (1, 1)

$m = 0$

Ex: (8, 2) and (4, 1)
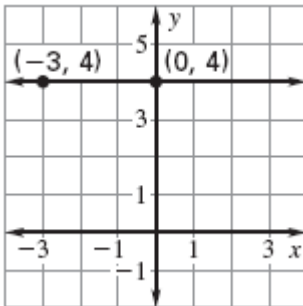
$m = \dfrac{1}{4}$

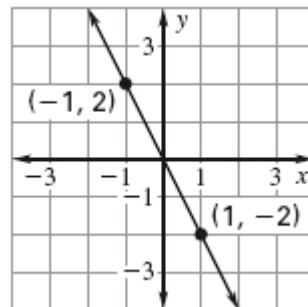**Ex:** (12, 9) and (6, 6)

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

- Be able to find the slope of a graphed line. *Be able to identify when it is positive, negative, zero and undefined.
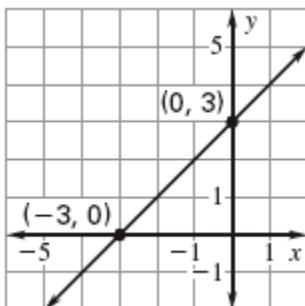
Ex:

$m = 0$
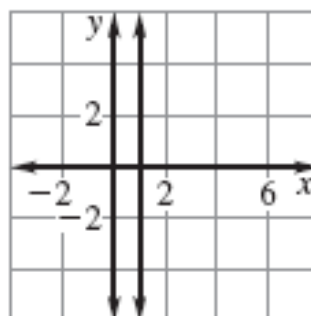
Ex:

$m = -2$

Ex:

$m = 1$

Ex:

$m = $ undefined

- Apply the slope formula to find a missing coordinate of an ordered pair:

Ex: $(0, y)$ $(2, 7)$ $m = ½$

1. Start with

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

2. Plug in everything you can

$$\frac{1}{2} = \frac{7 - y}{2 - 0}$$

3. Simplify anything that you can

$$\frac{1}{2} = \frac{7 - y}{2}$$

4. Solve like a proportion by cross multiplying

$1(2) = 2(7 - y)$

$2 = 14 - 2y$
$\underline{-14 -14}$
$\underline{-12 = -2y}$
$-2 -2$
$6 = y$

Ex: $(x, -2)$ $(1, 7)$ $m = 3$

1. Start with

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

2. Plug in everything you can

$$3 = \frac{7 - (-2)}{1 - x}$$

3. Simplify anything that you can

$$3 = \frac{9}{1 - x}$$

4. solve like a proportion by cross-multiplying. (You need to make 3 into a fraction)

$$\frac{3}{1} = \frac{9}{1 - x}$$

$9(1) = 3(1 - x)$
$9 = 3 - 3x$
$\underline{-3 -3}$
$\underline{6 = -3x}$
$-3 -3$
$-2 = x$

- Be able to apply slope to real-world problems to find rate of change:

Ex: The graph shows the cost (in dollars) to mail a letter that weighs one ounce during certain years.

    a. Find the rates of change for each interval showing the change in cost per year of postage.
From 1991-1995: $0.0075/year

From 1995-1999: $0.0025/year

From 1999-2001: $0.005/year

From 2001-2002; $0.03/year

    b. Determine the time interval during which the cost to mail a one-ounce letter showed the greatest rate of change.
The greatest rate of change was between 2001-2002 because it increased by 3 cents per year.

    c. Determine the time interval during which the cost to mail a one-ounce letter showed the least rate of change.

The least rate of change was between 1995-1999. It was only $0.0025/year.
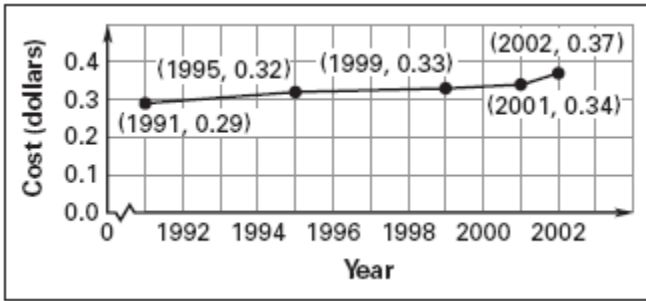
4.5: Graping Using Slope – Intercept Form

- Be able to rewrite an equation so it is in slope – intercept form and identify the slope and y – intercept:

Ex: $3x - 3y = 12$

$y = x - 4$

$m = 1, b = -4$

Ex: $y - 5x = -3$

$y = 5x - 3$
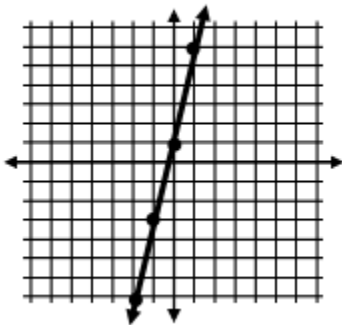
$m = 5, b = -3$

Ex: $x + 4y = 6$

$y = -\dfrac{1}{4}x + 1.5$

$m = -\dfrac{1}{4}, b = 1.5$
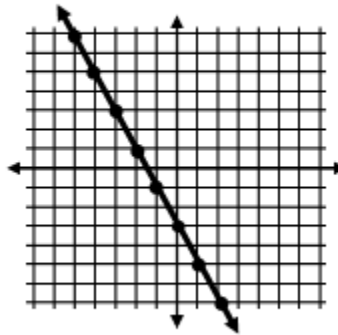
- Be able to graph using slope – intercept form

Ex: $y = 5x + 1$

Ex: $y = -2x - 3$

Ex: $y = -\dfrac{3}{4}x + 1.5$