Summary – Review 5.1 & 5.3

Slope: $\dfrac{Rise}{Run}$ $m = \dfrac{y_2 - y_1}{x_2 - x_1}$ *remember to label your points (x_1, y_1) (x_2, y_2)

Positive slope goes up from left to right
Negative slope goes down from left to right
Zero slope – Horizontal line
Undefined slope – Vertical line   **HOYVUX**

Slope Intercept Form: $y = mx + b$ *m is the slope, and b is the y-intercept

When Graphing, plot the y-intercept first, then count the slope to plot the other points (4). Remember to use a ruler and put arrows on your lines.

Pay attention to which direction your line is going...does it match the sign of your slope?

New Material: Section 5.4 Point-Slope Form

> **Point Slope Form:** $y - y_1 = m (x - x_1)$ *m is the slope, point (x_1, y_1)
>
> When using this form, you need to know the slope and a point (any point on the line); then plug it into the equation. We can convert to slope-intercept or standard form.

Examples – Put the following in Point Slope Form.

1. Write the equation of the line with the slope of −2 that passes through the point (3, −3). $\quad m = -2$
    $\quad x, \ y,$

    $$y - -3 = -2(x - 3)$$
    $$y + 3 = -2(x - 3)$$

2. Write the equation of the line with the slope of 4 that passes through the point (1, 2). $\quad m = 4$
    $\quad x, y,$

    $$y - 2 = 4(x - 1)$$

3. Write the equation of the line with the slope of $\dfrac{2}{3}$ that passes through the point (0, −5). $\quad m = \dfrac{2}{3}$
    $\quad x, \ y,$

    $$y - -5 = \frac{2}{3}(x - 0)$$
    $$y + 5 = \frac{2}{3}x$$

The line passes through the given points. Write an equation in Point Slope Form.

- Find the slope using the slope formula. $m = \dfrac{y_2 - y_1}{x_2 - x_1}$
- Use the slope and ONE of the points to write the equation.

4. (−1, −5) (−7, −6)
    $x_1\ y_1\ \ x_2\ y_2$

$m = \dfrac{-6 + +5}{-7 + +1} = \dfrac{-1}{-6}$

$m = \dfrac{1}{6}$

$y - -5 = \dfrac{1}{6}(x - -1)$

$y + 5 = \dfrac{1}{6}(x + 1)$

OR

$y - -6 = \dfrac{1}{6}(x - -7)$

$y + 6 = \dfrac{1}{6}(x + 7)$

5. (3, −8) (−2, 5)
    $x_1\ y_1\ \ x_2\ y_2$

$m = \dfrac{5 - -8}{-2 - 3} = \dfrac{13}{-5}$

$m = \dfrac{13}{-5}$

$y - -8 = \dfrac{13}{-5}(x - 3)$

$y + 8 = \dfrac{13}{-5}(x - 3)$

OR

$y - 5 = \dfrac{13}{-5}(x - -2)$

$y - 5 = \dfrac{13}{-5}(x + 2)$

6. (3, 0) (4, −1)
    $x_1\ y_1\ x_2\ y_2$

$m = \dfrac{-1 - 0}{4 - 3} = \dfrac{-1}{1}$

$m = -1$

$y - 0 = -1(x - 3)$

$y = -1(x - 3)$

OR

$y - -1 = -1(x - 4)$

$y + 1 = -1(x - 4)$