What information do we need to write a linear equation in Slope-Intercept Form?

$$y = mx + b$$

☆ We need two pieces of information to write the equation.

☆ 1. Slope 2. y-coordinate of the y-intercept

Write the equation of the line with the given information.

Ex 1: Slope is 1/2 and passes through (0, 5).

$m = \frac{1}{2}$ $b = 5$ $y = mx + b$

$y = \frac{1}{2}x + 5$

Ex 2: m = -1 and passes through (0, -3).

$b = -3$ $y = mx + b$

$y = -x + (-3)$

Ex 3: m = 3 and passes through (0, 0).

$b = 0$ $y = mx + b$

$y = 3x$

Ex 4: m = 0 and passes through (0, -8).

$b = -8$ $\quad y = mx + b$

$\boxed{y = -8}$

Ex 5: m is undefined and passes through (3, 4).

- You cannot write a "slope-intercept" equation because this is a vertical line and has an undefined slope!

$\boxed{x = 3}$

Ex 6: Passes through (0, -3) and parallel to $y = -\frac{1}{2}x + 1$

- Parallel lines have the same slope!

$m = -\frac{1}{2}$ $\quad y = mx + b$

$b = -3$ $\quad \boxed{y = -\frac{1}{2}x + (-3)}$

Ex 7: Passes through (0, 6) and parallel to $x = 5$

- This is a vertical line! It has an undefined slope!

$\boxed{x = 0}$

Ex 8: Passes through (0, -4) and (3, 0).

I II

- The slope is not given. Use the slope formula to calculate slope.

$m = \frac{\Delta y}{\Delta x} = \frac{0-(-4)}{3-0} = \frac{4}{3}$

$m = \frac{4}{3}$

$b = -4$

$y = mx + b$

$y = \frac{4}{3}x + (-4)$

Ex 9: Passes through $(2, -2\frac{1}{2})$ and (0, -3).

I II

$m = \frac{\Delta y}{\Delta x} = \frac{-3-(-2\frac{1}{2})}{0-2} = \frac{-\frac{1}{2}}{-2} = -\frac{1}{2}(-\frac{1}{2})$

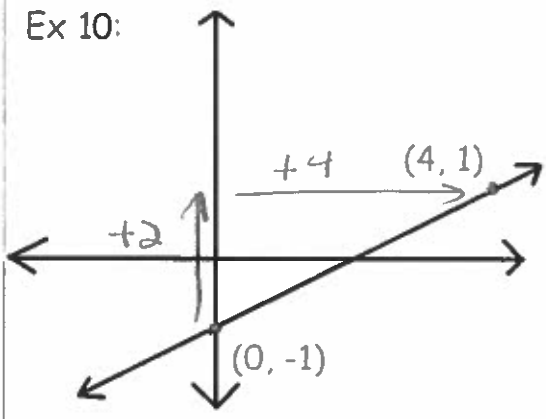
$m = \frac{1}{4}$

$b = -3$

$y = mx + b$

$y = \frac{1}{4}x + (-3)$

Ex 10:

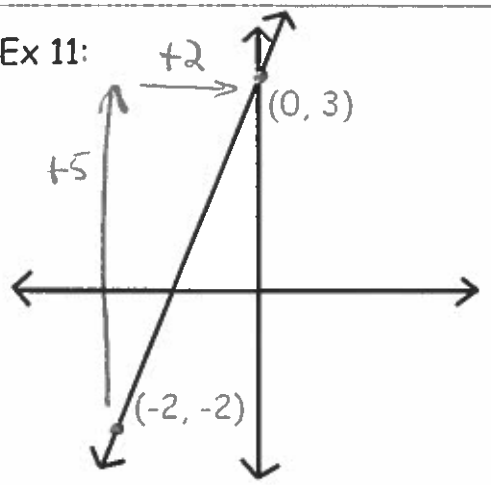


$m = \frac{\Delta y}{\Delta x} = \frac{2}{4} = \frac{1}{2}$

$b = -1$ $y = mx + b$

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

Ex 11:



$m = \frac{\Delta y}{\Delta x} = \frac{5}{2}$ $y = mx + b$

$b = 3$

$y = \frac{5}{2}x + 3$

Assignment #22

p. 286-287
#3-8 (Write the equation and graph labeling 3 points)
#10-23, 27-29, 45-47