Name: _____   Date: _____

Learning Goal 4.3	I can write an equation to represent a graph.

Remember our three ways to represent a line for graphing

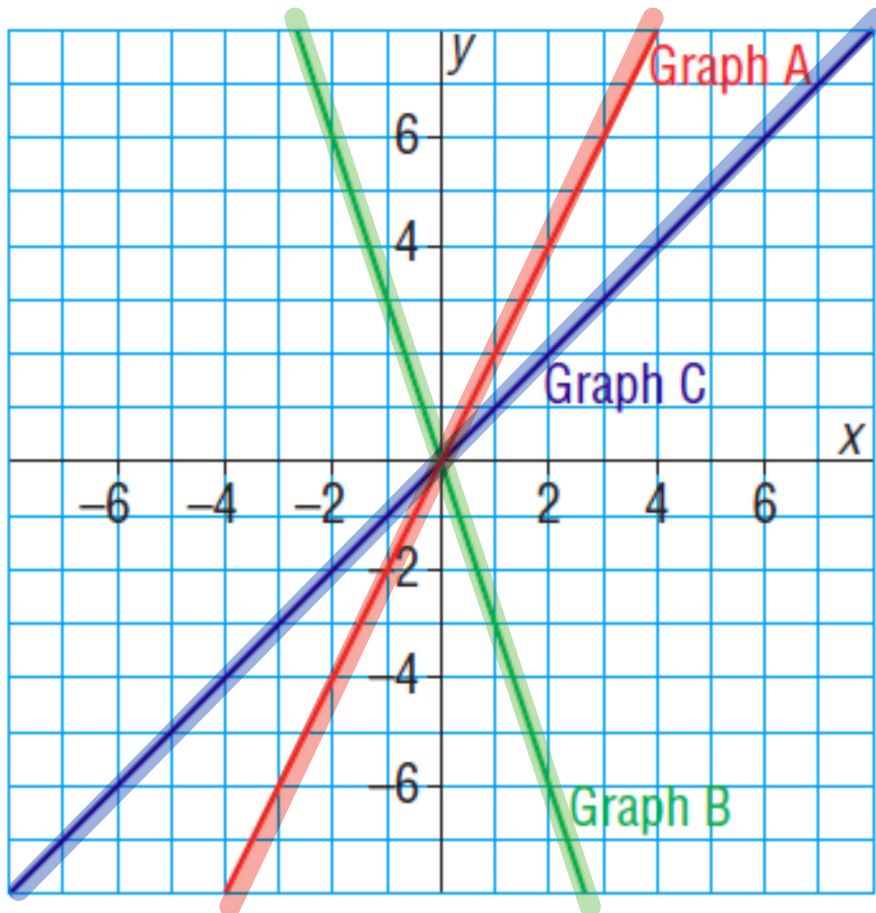$$\text{slope} = \frac{rise}{run} = \frac{\text{vertical change}}{\text{horizontal chang}}$$

1. **Slope - intercept form**

$$y = mx + b$$
y-intercept
(where the line crosses the vertical axis)

also slope

2. **Slope - point form**

$$y - y_1 = m(x - x_1)$$
- line passes through the point
(x_1, y_1)

3. **Standard form**

$$Ax + By = C$$
whole # $(0,1,2,3,...)$
integers $(...-2,-1,0,1,2,...)$
* no decimals or fractions

Example Match the graph to the equation.

$y = x$
or $y = 1x + 0$
   ↑   ↑
slope   y-int

$y = 2x$
or $y = 2x + 0$
   ↑   ↑
slope   y-int

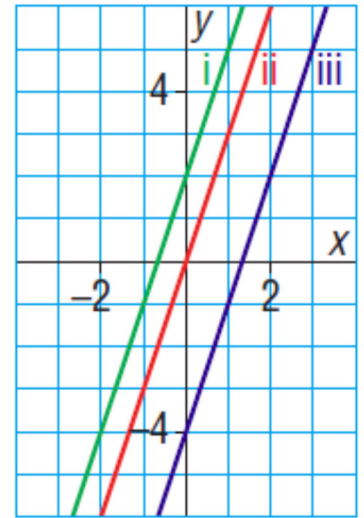$y = -3x$
or $y = (-3)x + 0$
   ↑   ↑
slope   y-int

Example Which graph on the grid is represented by $y = 3x - 4.$ Justify.

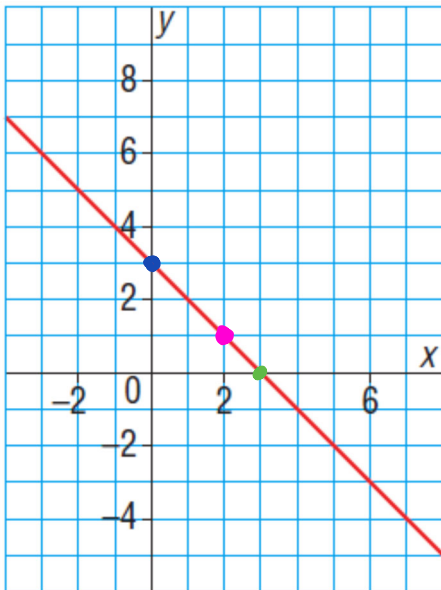slope   y-int

- all 3 lines have a slope of 3
  ⇒ all must have different
  y-intercepts

  $b = 2$
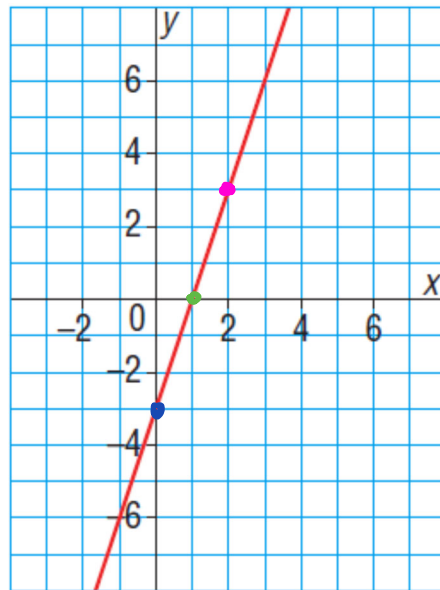 $b = 0$ ⇒ the blue line
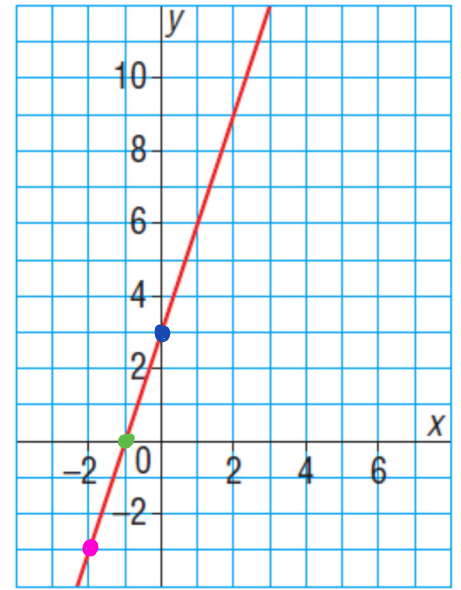 $b = 4$ represents the
                     equation

Example Decide what form of the equation would be simplest to use for each graph, then find the equation.

$y = -x + 3$

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

$x + y = 3$

$y = 3x - 3$

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

$3x - y = 3$

$y = 3x + 3$

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

$3x - y = -3$

~ completely subjective, though standard form is
  always the trickiest!