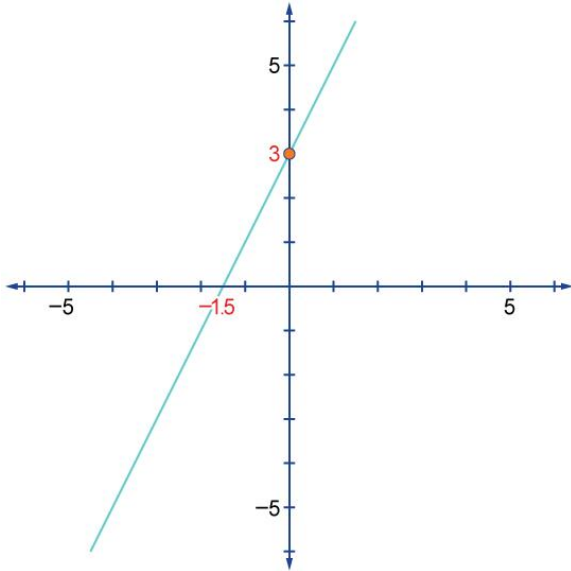
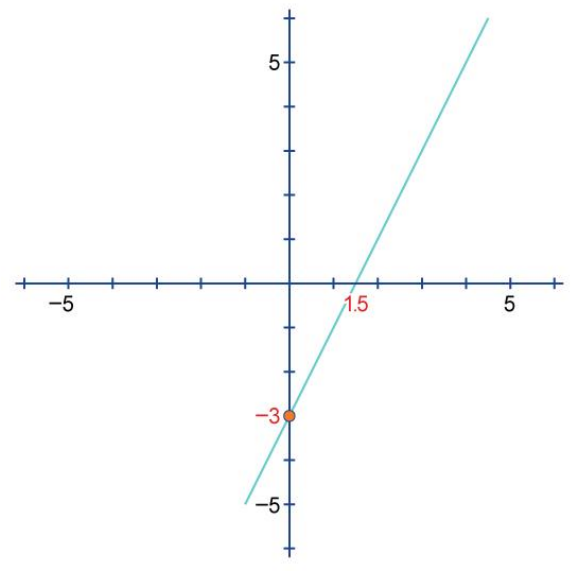
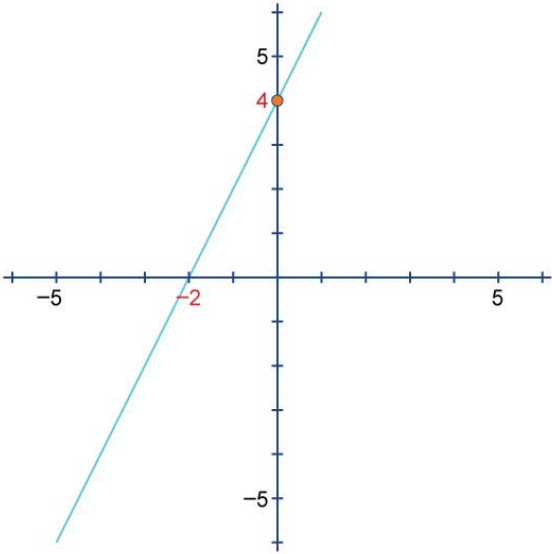
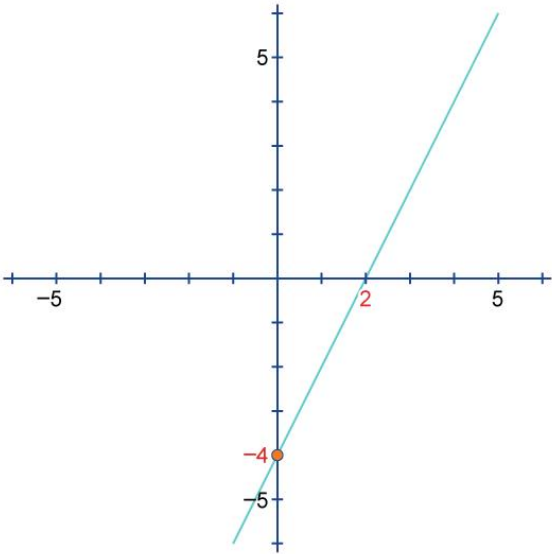


Module 5 Lesson 4: Math Lab: Linear Forms Possible Solutions

Part A

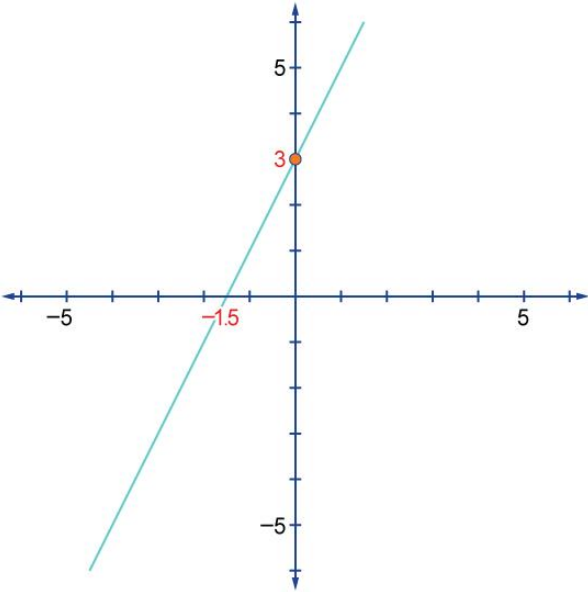
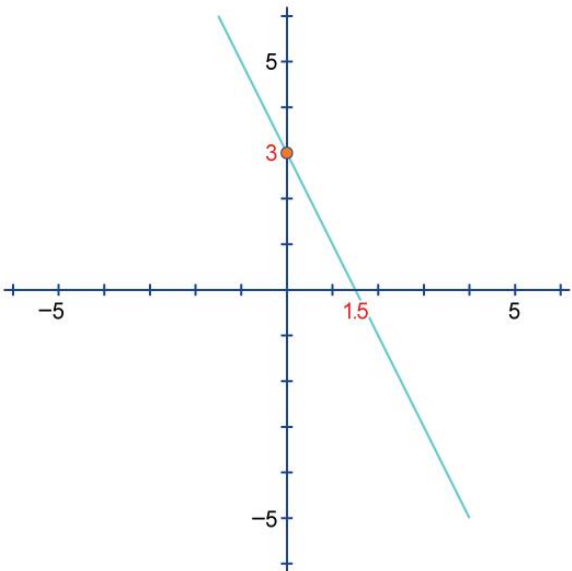
Equation	Slope-Intercept Form $y = mx + b$	Slope-Point Form $y - y_1 = m(x - x_1)$	General Form $Ax + By + C = 0$
$y = 2x + 3$ 	$m = 2$ $b = 3$	$y - y_1 = m(x - x_1)$ $y - 3 = 2(x - 0)$ $y - 3 = 2x$	$2x - y + 3 = 0$
$y = 2x - 3$ 	$m = 2$ $b = -3$	$y - y_1 = m(x - x_1)$ $y - (-3) = 2(x - 0)$ $y + 3 = 2x$	$2x - y - 3 = 0$

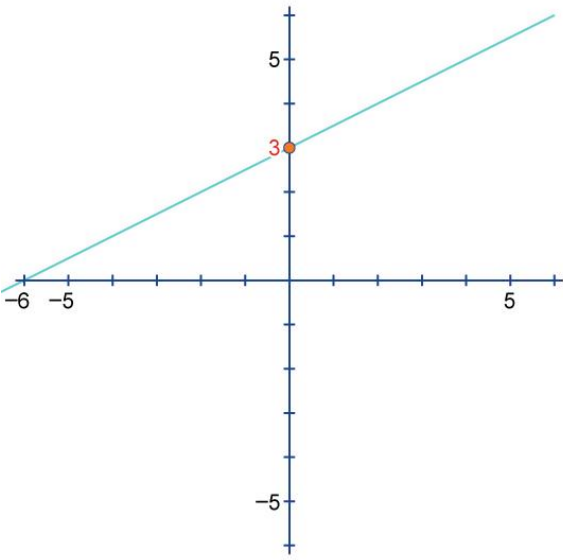
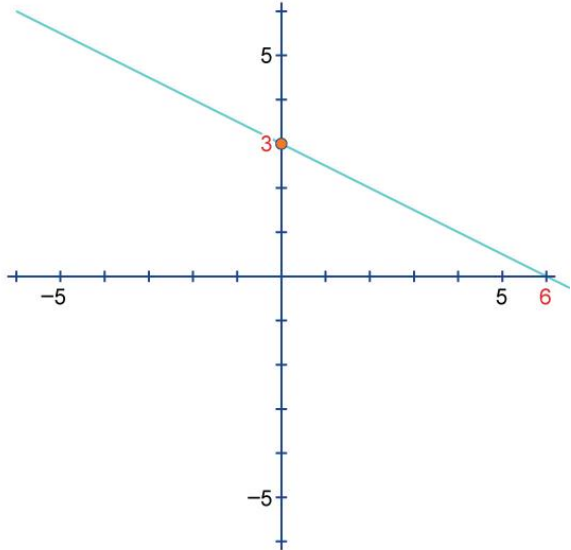
$y = 2x + 4$ 	$m = 2$ $b = 4$	$y - y_1 = m \ x - x_1$ $y - 4 = 2 \ x - 0$ $y - 4 = 2x$	$2x - y + 4 = 0$
$y = 2x - 4$ 	$m = 2$ $b = -4$	$y - y_1 = m \ x - x_1$ $y - -4 = 2 \ x - 0$ $y + 4 = 2x$	$2x - y - 4 = 0$

Analysis

1. The slope (or m value), 2, is the same in all graphs.
2. The y-intercept changes in each graph.
3. The three equations all result in the same graph because they are equal. They are the same equation; they just look different.

Part B

Equation	Slope-Intercept Form $y = mx + b$	Slope-Point Form $y - y_1 = m(x - x_1)$	General Form $Ax + By + C = 0$
$y = 2x + 3$ 	$m = 2$ $b = 3$	$y - y_1 = m(x - x_1)$ $y - 3 = 2(x - 0)$ $y - 3 = 2x$	$2x - y + 3 = 0$
$y = -2x + 3$ 	$m = -2$ $b = 3$	$y - y_1 = m(x - x_1)$ $y - 3 = -2(x - 0)$ $y - 3 = -2x$	$2x + y - 3 = 0$ An equation in general form does not start with a negative sign. So, if you have $-2x - y + 3 = 0$ as the equation in general form, multiply every term by -1 .

$y = \frac{1}{2}x + 3$ 	$m = \frac{1}{2}$ $b = 3$	$y - y_1 = m x - x_1$ $y - 3 = \frac{1}{2} x - 0$ $y - 3 = 0.5x$	$0.5x - y + 3 = 0$ $x - 2y + 6 = 0$ It is more common to make all of the coefficients to be integers; so if there is a decimal or a fraction, every term is multiplied by a value that will make all terms integers. In this case, multiply each term by 2.
$y = -\frac{1}{2}x + 3$ 	$m = -\frac{1}{2}$ $b = 3$	$y - y_1 = m x - x_1$ $y - 3 = -\frac{1}{2} x - 0$ $y - 3 = -0.5x$	$\frac{1}{2}x + y - 3 = 0$ $x + 2y - 6 = 0$

Analysis

- The y-intercept remains the same in each graph. The y-intercept is 3.
- The slope (or m value) changes in all of the graphs.
- The general form must be in the form $Ax + By + C = 0$, where A is a whole number and B and C are integers. In those cases where A is zero, then B must be a whole number. The coefficient for A in some of the previous equations was 0.5, so that means students need to multiply everything by 2 in order to get the 0.5 coefficient to a positive integer value (since $0.5 \times 2 = 1$).