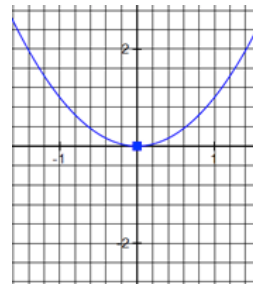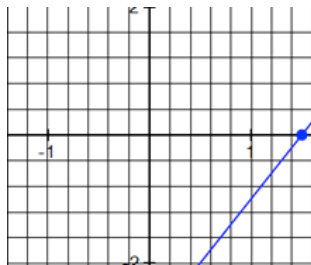# 9.0 Review of Linear Equations:
Graphing & Writing Equations

Objective: I can graph linear equations.

Objective: I can write a linear equation from 2 points.

Linear equation: an equation that makes a straight line when graphed

Linear or Not Linear? Why?

Linear Equations cont.

What do Linear equations have?

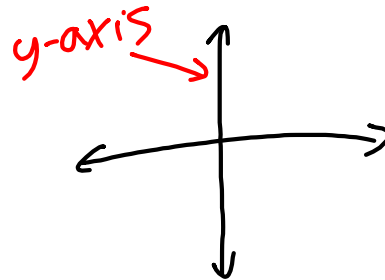slope and intercepts

What form do we write linear equations in to graph them? slope-intercept form (y=mx+b)

m = slope

y-axis

b = y-intercept

How to find slope:

$$(x_1, y_1) \ \& \ (x_2, y_2) \qquad m = \frac{y_2 - y_1}{x_2 - x_1} \qquad \left(\frac{rise}{run}\right)$$

How to find y-intercept:
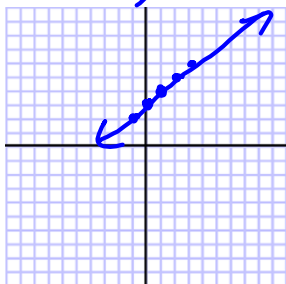
- plug 0 in for x and solve for y

How to graph Linear Functions

$y = x + 3$

$f(x) = x + 3$ $\qquad g(x) = -2x + 1$ $\qquad h(x) = \dfrac{1}{3}x + 0$

slope: $\dfrac{1}{1} = \dfrac{-1}{-1} \dfrac{rise}{run}$ $\quad$ slope: $\dfrac{-2}{1} = \dfrac{2}{-1}$ $\quad$ slope: $\dfrac{1}{3} = \dfrac{-1}{-3}$
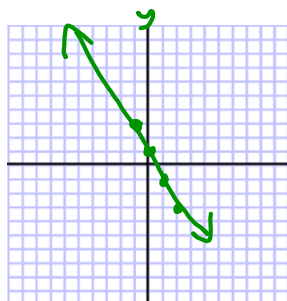
y-int.: 3 $\qquad$ y-int.: 1 $\qquad$ y-int.: 0
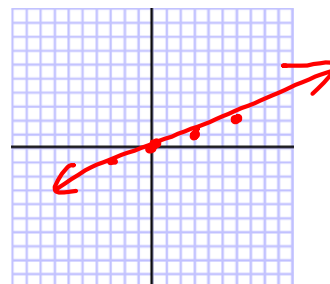
$y = mx + b$

Write the equation of the line that passes through the given points:

$(1, 4)$ & $(-2, 5)$

$x_1\, y_1 \quad x_2\, y_2$

Use point-slope form: $y - y_1 = m(x - x_1)$ ← point

$m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{5 - 4}{-2 - 1} = \dfrac{1}{-3}$

$m = -\dfrac{1}{3}$ $\quad (1, 4)$
$\qquad\qquad\quad x_1\, y_1$

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

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

$\boxed{y = -\dfrac{1}{3}x + \dfrac{13}{3}}$

goal
$y = mx + b$

$\dfrac{1}{3} + \dfrac{4 \cdot 3}{1 \cdot 3}$
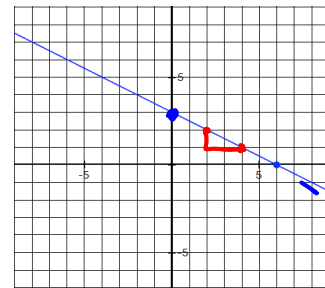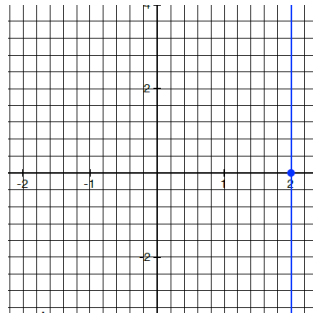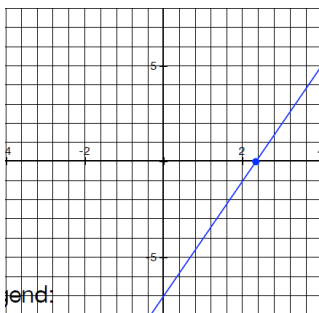
$\dfrac{1}{3} + \dfrac{12}{3} = \dfrac{13}{3}$

3

Write the equation of the line that passes through the points.

(2, 3) & (-1, 1)   (5, 2) & (-2, 2)

Given the graph, write the linear equation.

$$y = mx + b$$

$$y = \frac{-1}{2}x + 3$$

$y = \#$
horizontal
$y = 3$
$y = \dfrac{0}{1}x + 3$

$x = \#$
vertical
$x = -2$

$\dfrac{1}{0} = $ undef