Linear Functions

A function of the form:
$f(x) = m \cdot x + b$

where m and b are constants, is called a linear function.

Example: Find solutions to the linear function
$f(x) = -3 \cdot x + 6$

Recall: A solution of a function $y = f(x)$ is a pair of numbers $(x, f(x))$ OR (x, y) that makes the equation true.

$x = 0$

$f(x) =$

(,) is a solution

$x = 1$

$f(x) =$

(,) is a solution

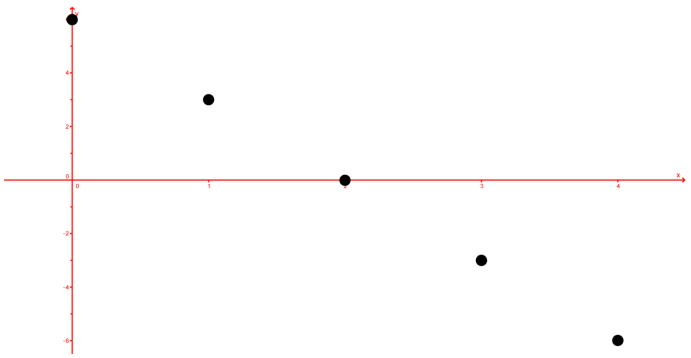
$x = 2$

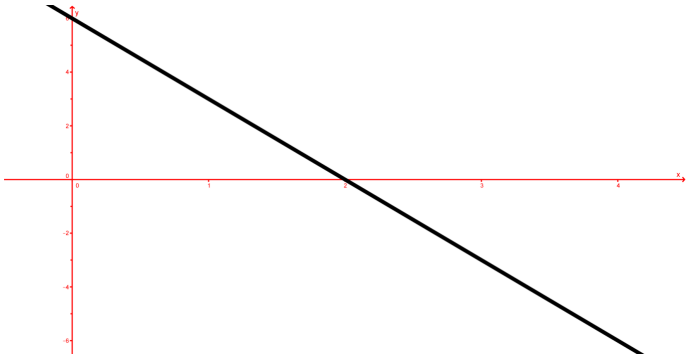
$f(x) =$

(,) is a solution

Solutions of: $f(x) = -3x + 6$

x	0	1	2	3	4
f(x)					





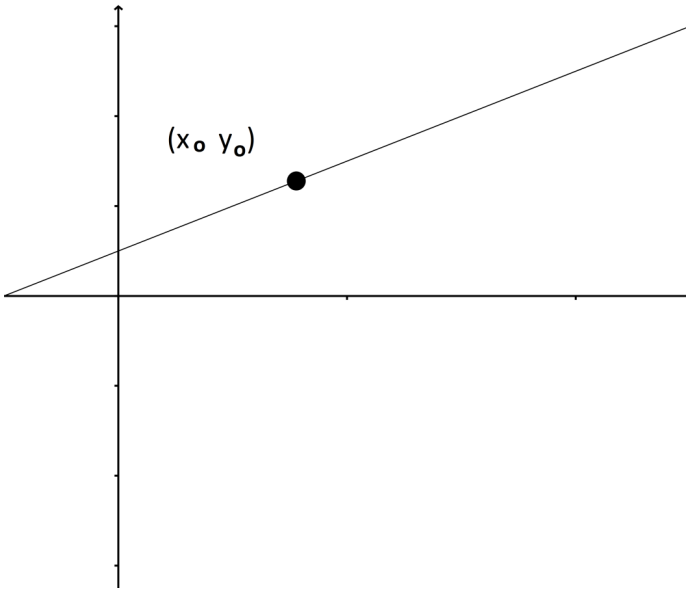
$y-$intercept: $x = 0$

$x-$intercept: $y = 0$

Note: The $y-$value of the $y-$int appears as the constant of $f(x) = -3 \cdot x + 6$

Another Equation for a line

Slope $= m$
Point : (x_o, y_o)



$$m = \frac{y - y_o}{x - x_o}$$

Point-Slope Form

An equation for a line with slope $= m$ and a point (x_o, y_o) is:

Example: Find an equation of the line with
slope $= m = -2$
Point: $(1, 2)$

Example: (Economics) Suppose we are starting a lemonade stand. We spend \$20 on a pitcher and wood to build the stand. We spend an additional \$2 on lemons, sugar, water, and ice for each pitcher of lemonade we make. What is the cost to run the lemonade stand?

Linear Functions Recap

Slope-Intercept Form:

Slope = Rate of change =

$y-$intercept:

$x-$intercept:

Point-Slope Form: where (x_o, y_o) is a point on the line.