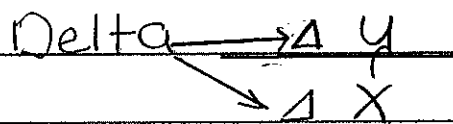


Section
2.3

Linear Functions

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

Change of y
Change of x



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + b$$

slope

$(0, b)$ is y intercept

Point Slope Formula

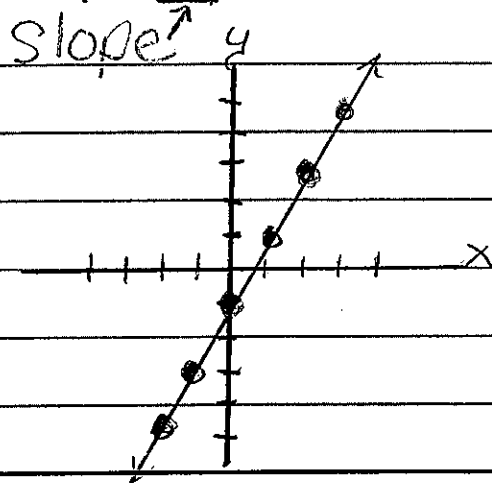
$$y - y_1 = m(x - x_1)$$

Graphing Lines

Homework #7

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

x	y
-2	-5
-1	-3
0	-1 (y-int.)
1	1
2	3
3	5



Example 1 Graph

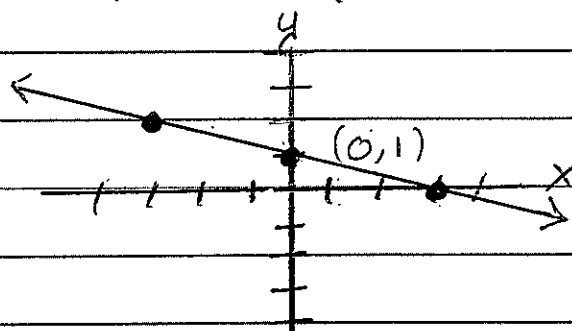
$$f(x) = -\frac{1}{3}x + 1$$

Down 1, Right 3 $m = \frac{-1}{3} \left(\frac{y}{x}\right)$

Up 1, down 3 $m = \frac{1}{-3} \left(\frac{y}{x}\right)$

x	y
6	-1
3	0
0	1 (y-int)
-3	2

Use slope and y intercept



Example 2 Find the y-intercept

a) $h(x) = -3.85x + 1$

$h(0) = 1$ (0, 1) y-intercept

b) $g(x) = \frac{-2}{11}x - \frac{1}{3}$

$g(0) = \left(0, -\frac{1}{3}\right)$ y-intercept

To find the y-intercept plug in zero for "x".

Example 3

Find the slope of the line that passes through,

$$\left(-\frac{1}{2}, \frac{1}{3}\right) \text{ and } \left(\frac{1}{6}, \frac{1}{6}\right)$$

Point 1

Point 2

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{\frac{1}{6} - \frac{1}{3}}{\frac{1}{6} - \left(-\frac{1}{2}\right)}$$

$$m = \frac{(6)\frac{1}{6} - (6)\frac{1}{3}}{(6)\frac{1}{6} + (6)\frac{1}{2}} \quad \text{LCD } 6$$

$$m = \frac{1 - 2}{1 + 3}$$

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

Example 4

Find the slope and the y-intercept for the line,

$$2x - 3y = 7$$

$$\begin{array}{r} \text{Solve for } y \\ 2x - 3y = 7 \\ -2x \quad -2x \\ \hline \end{array}$$

$$\frac{-3y}{-3} = \frac{-2x + 7}{-3}$$

$$y = \frac{2}{3}x - \frac{7}{3}$$

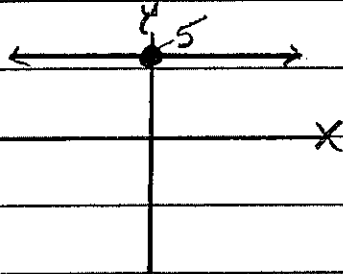
$$m = \frac{2}{3} \text{ (slope)}$$

$$\left(0, -\frac{7}{3}\right) \text{ y-intercept}$$

Recall:

$$y = 5$$

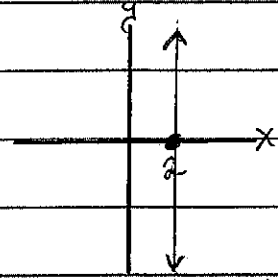
Horizontal line



$$m = \frac{0}{5}$$

$$x = 2$$

Vertical line



$$m = \text{undefined } \frac{2}{0}$$

Example 5

Find the Slope

$$g(x) = 3 \quad m = 0 \quad \text{Horizontal}$$

($y = 3$)

$$x = -4 \quad \text{slope is undefined}$$