POINT-SLOPE METHOD $y = m(x - x_1) + y_1$

Slope-Intercept Method $y = mx + b$

See Notes from yesterday.

Equation of the line thru $(7, 2)$ (x_1, y_1) and $(-3, 8)$ (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8-2}{-3-7}$$

$$= \frac{6}{-10} = \boxed{-\frac{3}{5} = m}$$

POINT-SLOPE:

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

$y = -\frac{3}{5}(x - 7) + 2$

Check!

$\frac{3}{5} \cdot \frac{7}{1} =$

$\frac{21}{5}$

$\frac{2}{1} \cdot \frac{5}{5} = \frac{10}{5}$

$y = -\frac{3}{5}x + \frac{21}{5} + \frac{10}{5}$

$y = -\frac{3}{5}x + \frac{31}{5}$

"AN EQUATION" $y = m(x - x_1) + y_1$ is quickest, slickest.

SLOPE-INTERCEPT

$y = mx + b$

$2 = -\frac{3}{5}(7) + b$

$5\left[2 = -\frac{3}{5}(7) + b\right]$

$10 = -3(7) + 5b$

$10 = -21 + 5b$

$31 = 5b$

$\frac{31}{5} = b$

yikes!

$\boxed{y = -\frac{3}{5}x + \frac{31}{5}}$

Find an equation of the line Parallel to the line thru (7,2), (-3,8) that passes thru (3, 17.9π)

By previous work, $m = -\frac{3}{5}$

17.9π is just a number. No big.

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

$y = -\frac{3}{5}(x-3) + 17.9\pi$

Parallel: $m_2 = m_1$

Perpendicular: $m_2 = -\frac{1}{m_1}$

Same pt: (3, 17.9π), and a line perpendicular to the line thru (7,2) & (-3,8):

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

$y = \frac{5}{3}(x-3) + 17.9\pi$

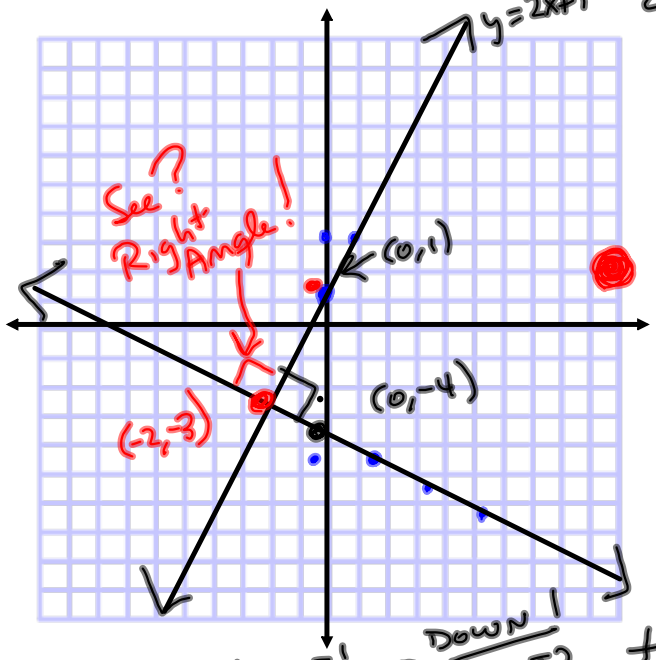
$m_2 = -\frac{1}{m_1}$

$m_2 = -\frac{1}{(-\frac{3}{5})}$

INVERT AND MULTIPLY

$m_2 = -1 \cdot (-\frac{5}{3})$

$m_2 = \frac{5}{3}$



$y = 2x + 1$

$(0,1)$ is y-int.

x-int: $(?, 0)$

$0 = 2x + 1 = 0$

$2x = -1$

$x = -\frac{1}{2} \rightsquigarrow (-\frac{1}{2}, 0)$

$y = 2x+1$ has slope

$m = 2 = \frac{\text{up } 2}{\text{right } 1}$

$2 = \frac{2}{1}$

$m_2 = -\frac{1}{2} = \frac{-1}{2} = \frac{\text{DOWN } 1}{\text{RIGHT } 2}$

A line perpendicular to this, passing thru $(-2,-3)$:

$y = m(x - x_1) + y_1 \quad m_2 = -\frac{1}{2}$

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

Good! A line!

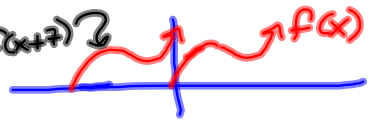
$y = -\frac{1}{2}x - 1 - 3$

$y = -\frac{1}{2}x - 4$

Handy for graphing with slope & y-intercept.

$(0, b) = (0, -4)$

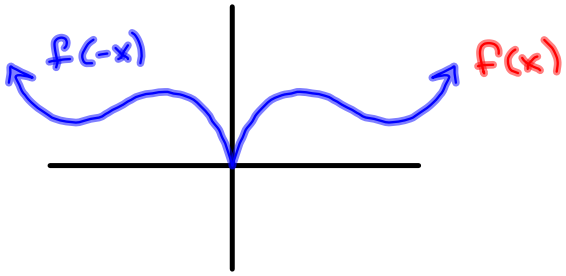
§ 3.6 Finish-up:



HORIZONTAL SHIFT $f(x+7)$ left 7

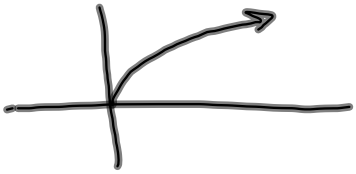
VERTICAL SHIFT $f(x)+7$ up 7

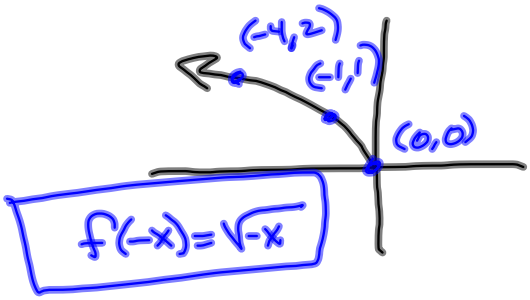
Flips! (Reflections)



$f(x) = \sqrt{x}$

x	f(x)
0	0
1	1
4	2





$f(-x) = \sqrt{-x}$

x	f(x)
0	0
1	Nope
-1	1
-4	2

$\sqrt{-0} =$

$\sqrt{-1} = i$ Nawp

$\sqrt{-(-1)} = \sqrt{1} = 1$

$\sqrt{-(-4)} = \sqrt{4} = 2$

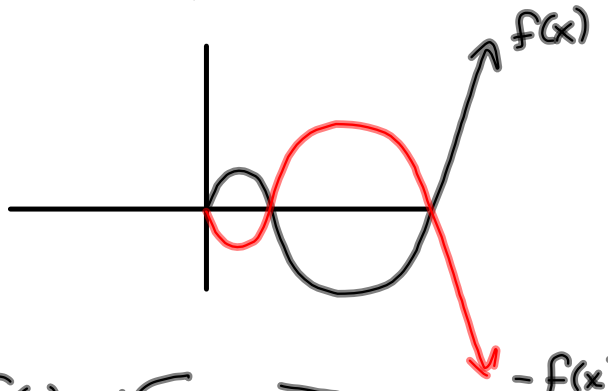
$f(-x)$: Replace (x,y) by $(-x,y)$

$(0,0) \longrightarrow (0,0)$

$(1,1) \longrightarrow (-1,1)$

$(4,2) \longrightarrow (-4,2)$

$-f(x)$

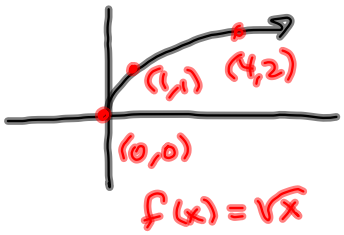


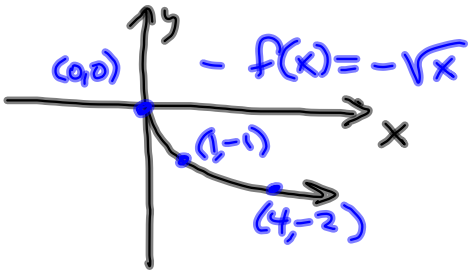
Flip it about the x-axis

$f(x) = \sqrt{x} \Rightarrow$

$-f(x) = -\sqrt{x}$

$(x,y) \longrightarrow (x,-y)$





Feb 15-9:52 AM

Homework Due Monday

Next up:

Combining shifts & reflections.

§3.7 Graphing Linear Inequalities

Scratch out the Bad Stuff!

Feb 15-9:57 AM