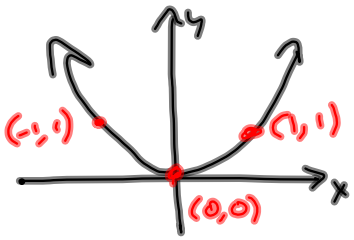
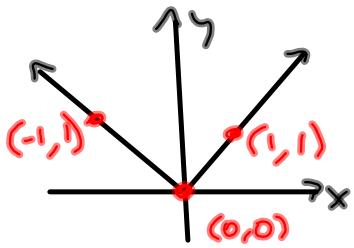
Homework Solutions are Posted.

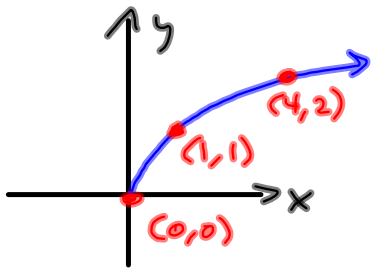
$f(x) = x^2$



$f(x) = |x|$



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



Homework: 48 pts + 4 Bonus possible

$A = P(1+\frac{r}{n})^{nt}$ Learn how to implement this.

TI-30 $\mathbb{X}$ is a nice 1-step calculator.

6. $\varnothing$ 7. $\varnothing$ 8. $(-\infty, \infty)$

$|9x+7| = |3x-1|$

$9x+7 = 3x-1$ OR $9x+7 = -(3x-1)$ The Key

$6x = -8$ OR $9x+7 = -3x+1$

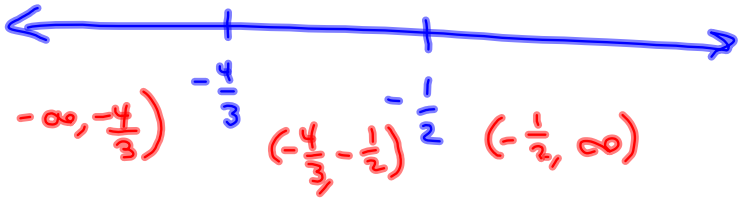
$x = -\frac{8}{6} = -\frac{4}{3}$ OR $12x = -6$

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

$x \in \{-\frac{4}{3}, -\frac{1}{2}\}$

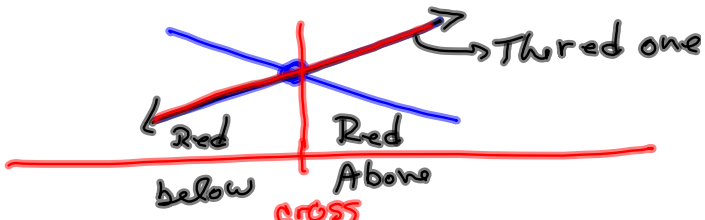
Some are writing this: $\{x \mid x = -\frac{4}{3} \text{ OR } x = -\frac{1}{2}\}$ which is fine, but when the solution set only has 2 numbers, total, just listing them is easier. $x \in \{-\frac{4}{3}, -\frac{1}{2}\}$

Mega-Bonus is taking THIS and applying it to $|9x+7| > |3x-1|$.



This breaks up $\mathbb{R}$ into 3 pieces.

$x = -\frac{4}{3}$ & $x = -\frac{1}{2}$ is where they cross.
at these crossings, the switch who's on top



Analyze above & Below:

	Test	$\lvert 9x+7\rvert$? $\lvert 3x-1\rvert$	
$(-\infty, -\frac{4}{3})$	$x=-2$	$11 > 7$	Yes.
$(-\frac{4}{3}, -\frac{1}{2})$	$x=-1$	$2 < 4$	No
$(-\frac{1}{2}, \infty)$	$x=0$	$7 > 1$	Yes

Scratch:
$|9(-2)+7| = |-18+7| \neq -11$
$= 11$
$|3(-2)-1| = |-6-1|$
$= |-7| = 7$

$|9(-1)+7| = |-2| =$
$|3(-1)-1| = |-4| =$
$|7| = 7$
$|-1| = 1$

Answer: $(-\infty, -\frac{4}{3}) \cup (-\frac{1}{2}, \infty)$

Fixes Teacher's Flatulence week!

Quiz on Tuesday, Based on Home 02
It may have something from Home 01.

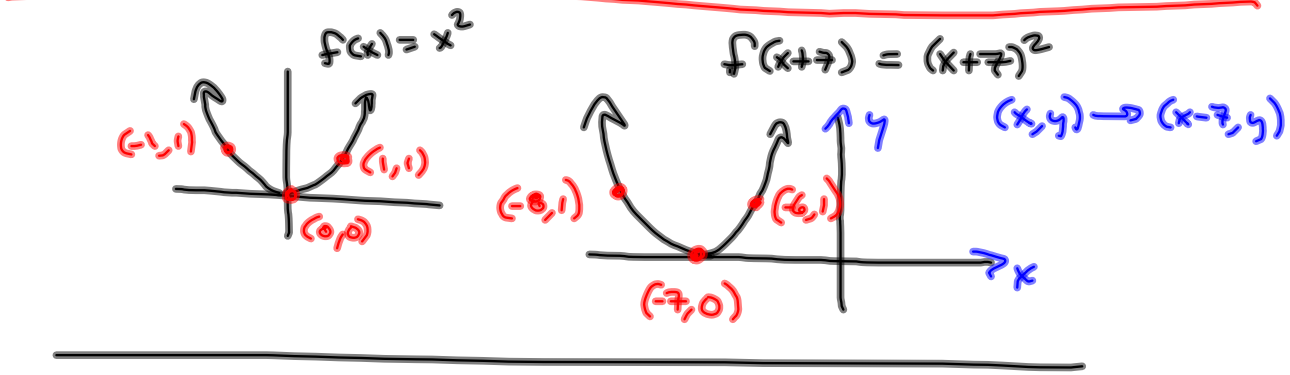
The x^2, $|x|$, & $\sqrt{x}$ talk is from §3.6

Horizontal Shift: $f(x+7)$ Left 7 Advance

Horizontals are "opposite" of your intuition. $(x,y) \longrightarrow (x-7,y)$

$f(x-5)$ Right 5 Delay

$(x,y) \longrightarrow (x+5,y)$



$f(x) + 7$ Vertical shift

up 7

$(x, y) \longrightarrow (x, y+7)$

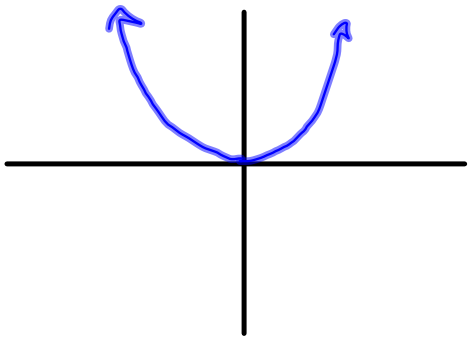
These are intuitive. Just what you'd hope.

$f(x) - 5$

down 5

$(x, y) \longrightarrow (x, y-5)$

$g(x) = (x+3)^2 - 11$



$f(x) = x^2$ and $g(x) = f(x+3) - 11$

Writing $g(x)$ in terms of the basic functions.

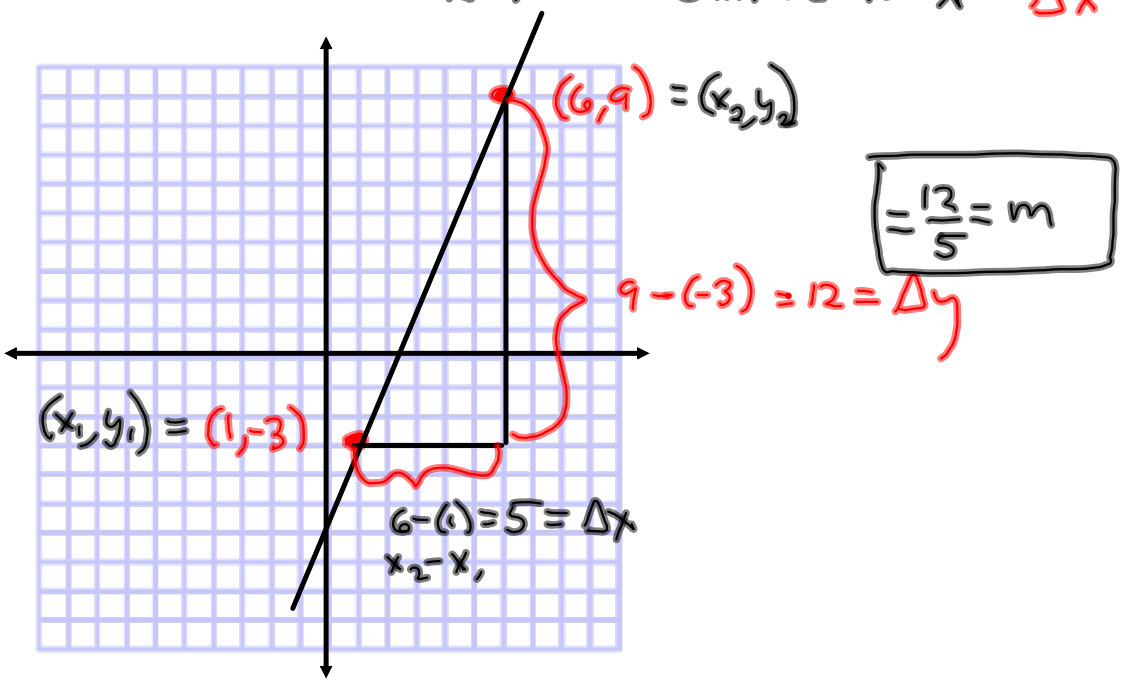
$f(x+3) - 11$

left 3 down 11

Step Back to §3.4

Slope of the Line Between Two Points.

$$m = \text{SLOPE} = \frac{\text{RISE}}{\text{RUN}} = \frac{\text{CHANGE IN } Y}{\text{CHANGE IN } X} = \frac{\Delta y}{\Delta x}$$

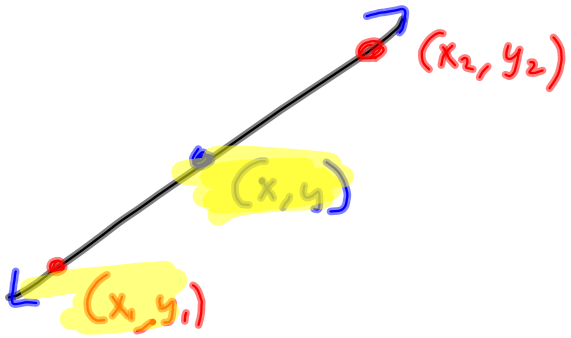


Equation of the Line – Jumped the Gun

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

Equation of the Line with slope

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



Let (x,y) be another point on the line.

Then the slope between it and (x_1, y_1) is

$$m = \frac{y - y_1}{x - x_1} = m$$

Clear fractions

$$\left(\frac{y - y_1}{x - x_1}\right)(x - x_1) = m(x - x_1)$$

$y - y_1 = m(x - x_1)$ is POINT-SLOPE FORM.

Given a point on the line $\mathcal{L}$, and the slope, we can write the equation of $\mathcal{L}$ in ONE STEP.

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

Slope-Intercept Method $y = mx + b$

See Notes from yesterday.

Feb 13-9:12 AM

New for Valentine's Day

$$f(x) = \begin{cases} 2x-4 & \text{for } x > 3 \\ x^2-5 & x \le 3 \end{cases}$$

○ ●

Piecewise-Defined functions:

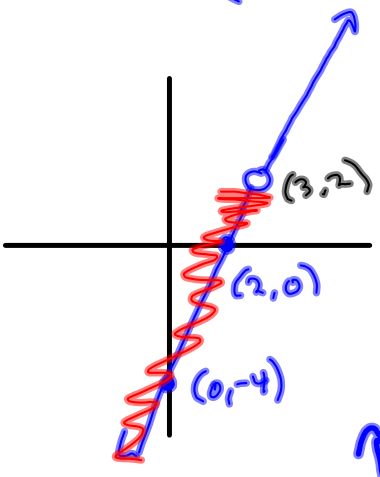
① Graph each piece

② Find endpoints & suture points

$2x-4=0$

$2x=4$

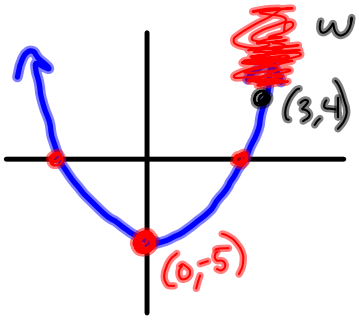
$x=2$



Want $x>3$ where's it kick in?

$x=3$! Suture Point.

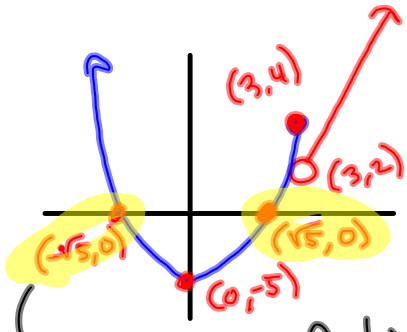
$2(3)-4=2 \rightsquigarrow (3,2)$ ○



Want $x \le 3$

$x=3$: Suture point.

$3^2-5=4 \rightsquigarrow (3,4)$ ●



Bonus for finding intercepts of quadratics.

$x^2-5=0$

$x^2=5$

$\sqrt{x^2}=\sqrt{5}$

$|x|=\sqrt{5}$

$x=\pm\sqrt{5}$

$x=-3$

$\sqrt{x^2} =$

$\sqrt{(-3)^2}=\sqrt{9}$

$=3 \neq x$

$3=-x$