Today: pw-def.

We're getting into a routine, now.

Brief lecture

Homework Pointers & style CONTEXT Narrative

See my solutions on http://www.harryzaims.com/

http://www.harryzaims.com/121-all/121-fall-13/homework/solutions/

87 $y = x^2 + x = f(x) \Rightarrow \frac{f(x+h) - f(x)}{h}$

$= \frac{(x+h)^2 + (x+h) - (x^2 + x)}{h} = \frac{x^2 + 2xh + h^2 + x + h - x^2 - x}{h}$

$= \frac{2xh + h^2 + h}{h} = \frac{h(2x + h + 1)}{h} = \boxed{2x + h + 1}$

Context/Completeness of work is $\frac{2}{10}$ on 10-point assignment.

§2.3 homework

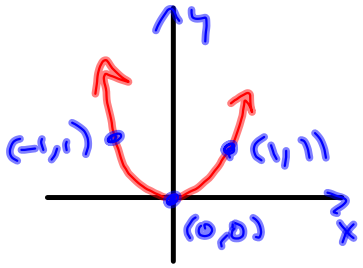
#s 45-73, 93-99

#45-59 Use transformations to graph the function. State D & R.

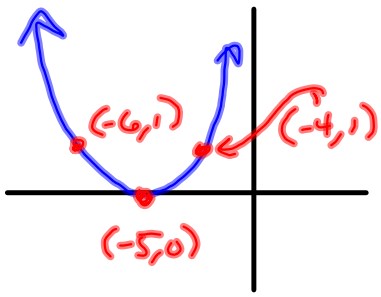
(46) $y = g(x) = (x+5)^2 - 4$

$f(x) = x^2 \longrightarrow (x+5)^2 \longrightarrow (x+5)^2 - 4$

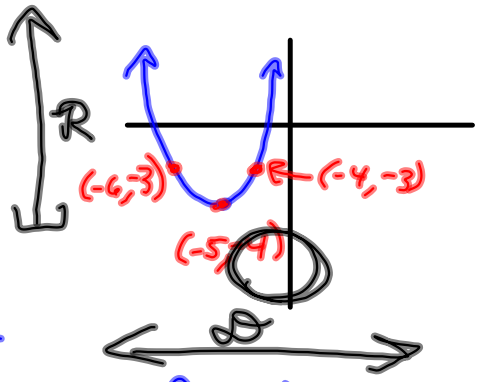
$f(x) = x^2 \longrightarrow x^2 - 4 \longrightarrow (x+5)^2 - 4$



$f(x) = x^2$



$f(x+5) = (x+5)^2$



$f(x+5) - 4 = (x+5)^2 - 4$

Soon we will be finding x- & y-intercepts, but not yet.

$D = \mathbb{R} = (-\infty, \infty) = \{x \mid x \text{ is real}\}$

Interval Set-builder

$R = [-4, \infty) = \{x \mid x \geq -4\}$

$g(x) = (x+5)^2 - 4$

x is real $\Rightarrow$ x+5 is real

$\Rightarrow (x+5)^2$ is real

$\Rightarrow (x+5)^2 - 4$ is real

$g(x) = \sqrt{3-x} + 7 = \sqrt{-x+3} + 7$

My stupid way

$f(x) = \sqrt{x} \longrightarrow \sqrt{-x}$ flip $\longrightarrow \sqrt{-(x-3)}$ RIGHT 3 $\longrightarrow \sqrt{-(x-3)} + 7$ UP 7

You might like:

$f(x) = \sqrt{x} \longrightarrow \sqrt{x+3}$ Left 3 $\longrightarrow \sqrt{-x+3}$ flip $\longrightarrow \sqrt{-(x-3)} + 7$ UP 7

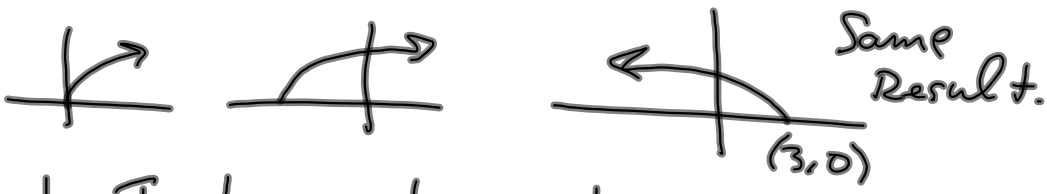
$-x+3 = -1x + (-1)(-3)$

$= -1(x-3)$

$f(x)=\sqrt{x} \rightarrow \sqrt{-x} \rightarrow \sqrt{-(x-3)}$

Same result

$f(x)=\sqrt{x} \rightarrow \sqrt{x+3} \rightarrow \sqrt{-x+3}$



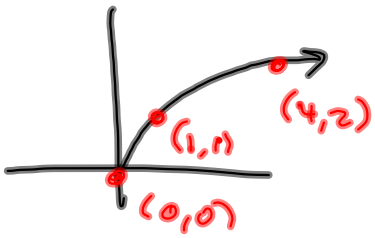
Same Result.

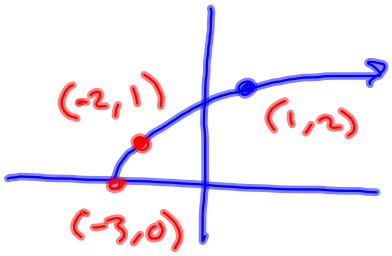
What I'd want on homework.

$g(x)=\sqrt{3-x}+7$

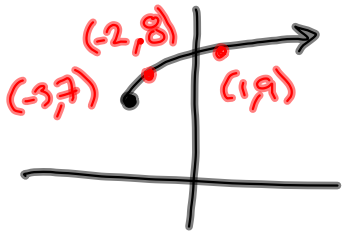
$f(x)=\sqrt{x}$

$\sqrt{x+3} = f(x+3)$

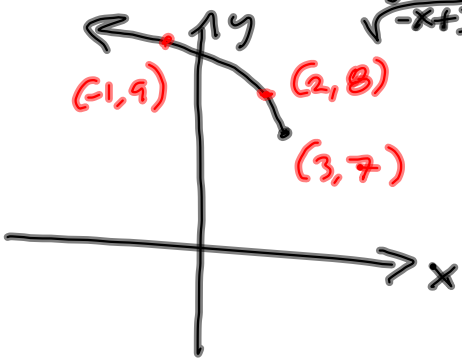




$f(x+3)+7 = \sqrt{x+3}+7$



$f(-x+3)+7 = g(x) = \sqrt{-x+3}+7$

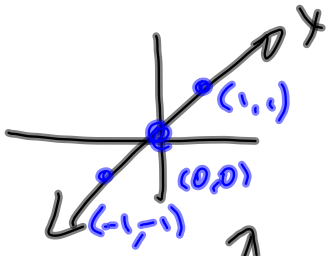


$D = (-\infty, 3]$

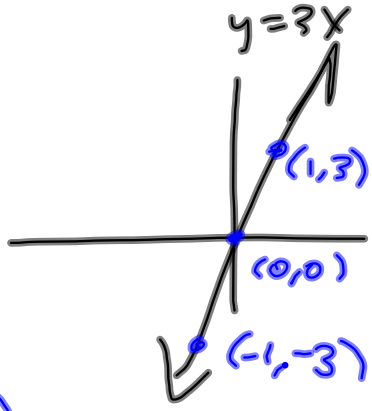
$R = [7, \infty)$

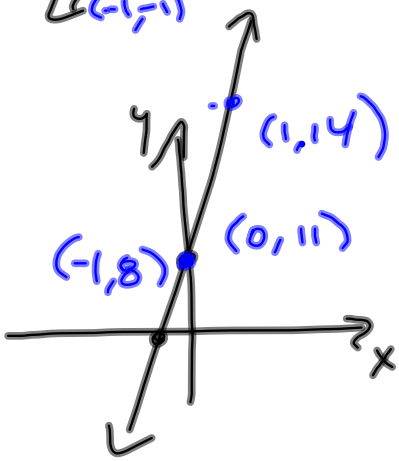
$y = 7$

$y = 3x + 11$



$y = 3x$

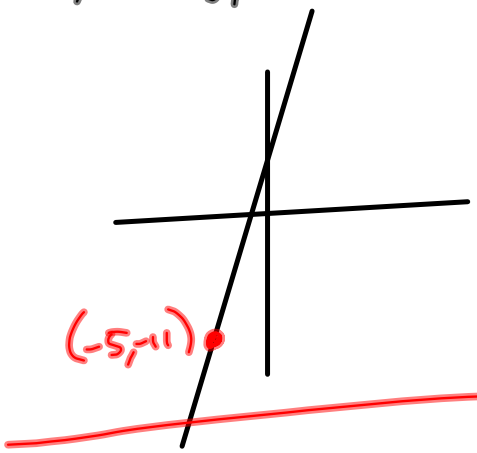




$g(x) = 3(x+5) - 11$

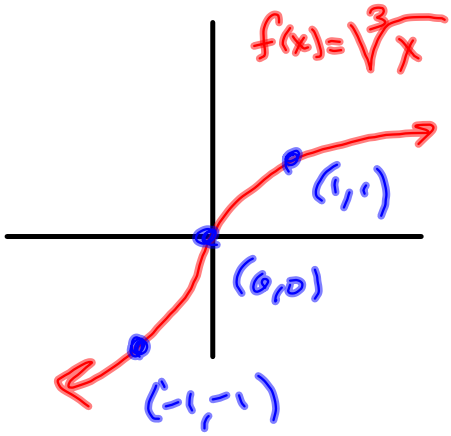
$(0,0) \rightarrow (0,0) \rightarrow (-5,0) \rightarrow (-5,-11)$

$x \rightarrow 3x \rightarrow 3(x+5) \rightarrow 3(x+5) - 11$

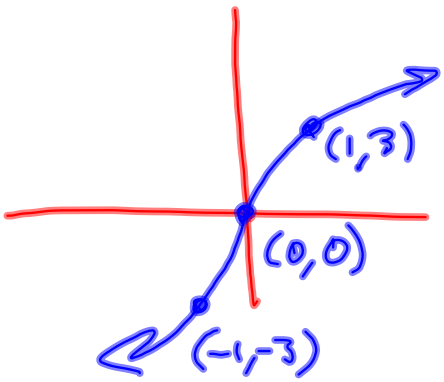


$3\sqrt[3]{x+5} - 11$

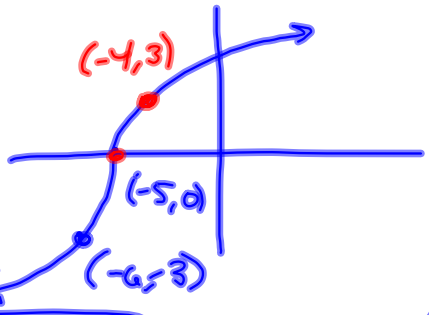
$f(x) = \sqrt[3]{x}$



$3f(x) = 3\sqrt[3]{x}$

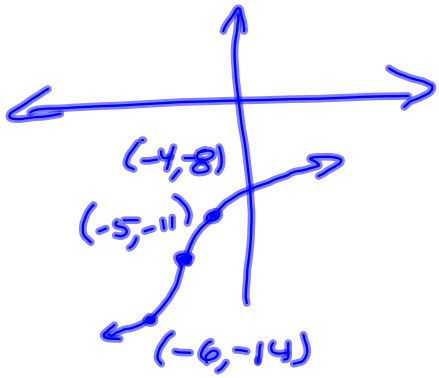


$3f(x+5) = 3\sqrt[3]{x+5}$



$3f(x+5) - 11 = 3\sqrt[3]{x+5} - 11$

$= g(x)$



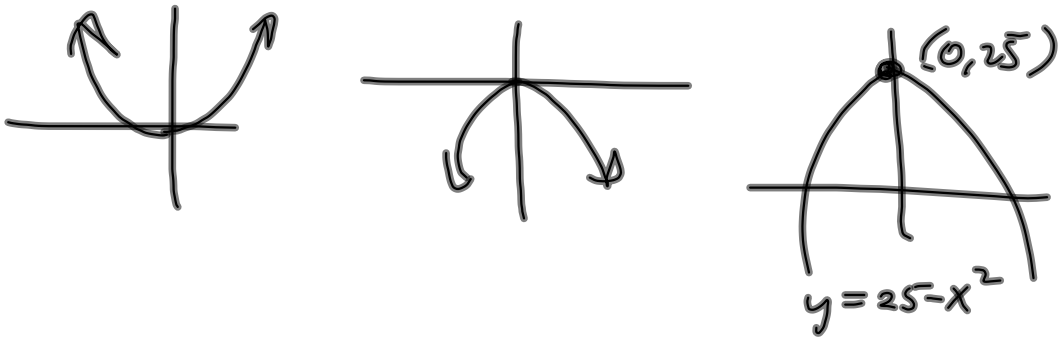
(99) $\sqrt{25-x^2} > 0$

$\sqrt{\text{stuff}}$ = Principal Square root of stuff ≥ 0 always, provided stuff is in the domain.

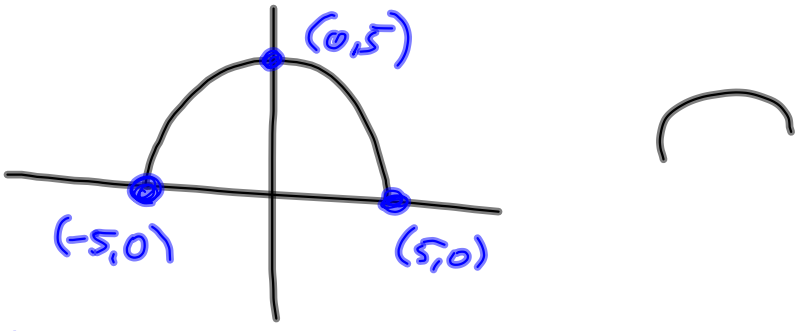
$\mathcal{D}\left(\sqrt{25-x^2}\right) = \{x \mid 25-x^2 \geq 0\}$

Look @ $y = 25-x^2$

$x^2 \longrightarrow -x^2 \longrightarrow -x^2+25$



$y = \sqrt{25-x^2}$ looks like:



So $25-x^2 > 0$ when $-5 < x < 5$

§2.2 #73

$$f(x)=\begin{cases} -x-2 & \text{if } x\le 0 \\ 2x-2 & \text{if } x>0 \end{cases}$$

l.

m

$(-3,1), (0,-2)$

$m=\frac{-2-1}{0+3}=\frac{-3}{3}=-1$

$y=-1(x-0)-2=-x-2$

Sep 11-8:54 AM