

The Book does OK on

Vertical Stretches  $af(x)$

Vertical Shifts  $f(x) + k$

Horizontal Shifts  $f(x-h)$

Book is NOT so good at

Horizontal Flips  $f(-x)$

Horizontal Stretches  $f(ax)$

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This is Writing Project 2 Stuff!

- METHODS:
- Do stretches first. (Flips handled in stretches step)
  - Wait til end to do horizontal stretches/flips.

METHOD 1

$$g(x) = -2\sqrt{5x+10} + 11$$

Re-write  $5x+10$  as  $5(x + \frac{10}{5}) = 5(x+2)$

Then the moves to handle  $5x+10$ , inside,

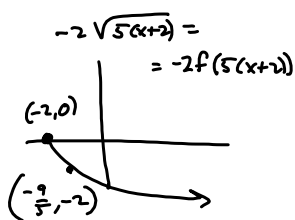
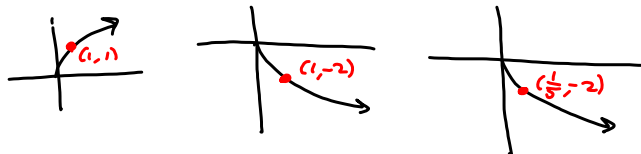
are  $x \mapsto 5x \mapsto 5(x+2)$        $x \mapsto x+2$  (Early Start)  
 $\sqrt{x} \mapsto \sqrt{5x} \mapsto \sqrt{5(x+2)}$       LFFT 2 (Early Start)  
 $(1,1) \mapsto (\frac{1}{5}, 1) \mapsto (\frac{1}{5}-2, 1) = (-\frac{9}{5}, 1)$  "Advance"

It gets there 5 times quicker, so it gets " in  $\frac{1}{5}$  the time

$$g(x) = -2\sqrt{5x+10} + 11 = -2\sqrt{5(x+2)} + 11$$

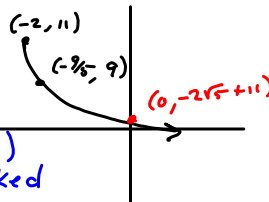
Safe Roadmap:

$$f(x) = \sqrt{x} \quad -2f(x) = -2\sqrt{x} \quad -2\sqrt{5x} = -2f(5x)$$



$-2\sqrt{5(x+2)} + 11 = g(x)$   
 - Check y-int.  
 $g(0) = -2\sqrt{5} + 11$  is positive.  
 (Tells me how to locate x- & y-axes, basically)

On your projects, I will want you to track movements of 2 or 3 (usually 3) key points. We tracked  $(0,0)$  &  $(1,1)$ , here



$\sqrt{x}$	$-2\sqrt{x}$	$-2\sqrt{5x}$	$-2\sqrt{5(x+2)}$
$(0,0)$	$(0,0)$	$(0,0)$	$(-2,0)$
$(1,1)$	$(1,-2)$	$(\frac{1}{5}, -2)$	$(-\frac{9}{5}, -2)$

$$\frac{1}{5} - 2 = -\frac{9}{5}$$

$$-2\sqrt{5(x+2)} + 11$$

$(-2, 11)$   
 $(-\frac{9}{5}, 9)$  } where  $(0,0)$  &  $(1,1)$  ended up after all the mean things I did to  $f(x)$  to get to  $g(x)$ .