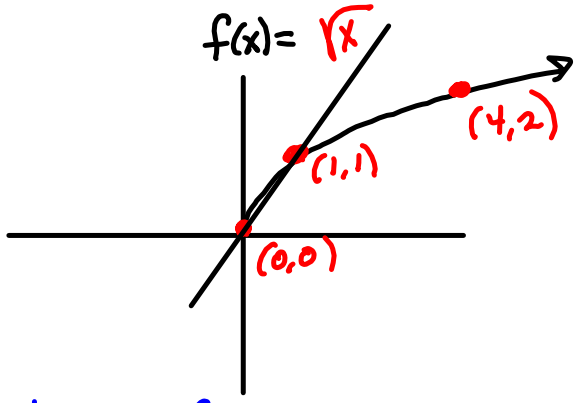
Homework:

I've been very kind, to date. Starting Chapter 2, if you don't follow the forms and give a narrative of your work, 50% deduction. I'm not looking for answers. I'm looking for a learning and explaining document.

A short report.

Tests look good, generally. You're Grokking in Fullness. (Stranger in a Strange Land.)



4 Moves

$\sqrt{1} = 1$

$\sqrt{7-6} = \sqrt{1}$

.

$\sqrt{\frac{4}{25}} = \frac{2}{5} = \frac{10}{25}$

$\frac{4}{25} < \frac{10}{25}$

(1) HORIZONTAL SHIFT

$f(x+c)$: $f(x+5) = \sqrt{x+5}$

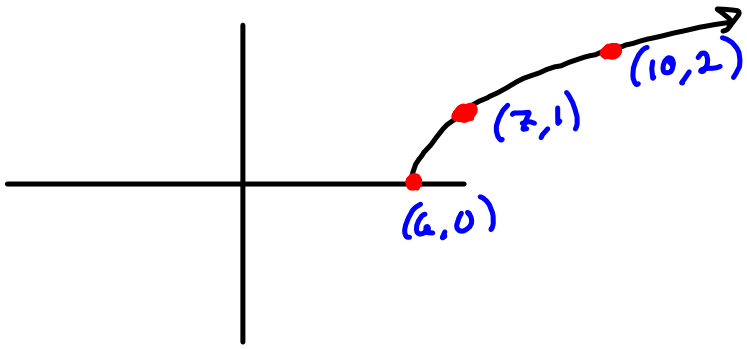
$f(x-c)$: $f(x-6) = \sqrt{x-6}$

$f(x-6) = \sqrt{x-6}$

$f(x-6)$: RIGHT 6

ORIGINAL NEW

$(x,y) \rightarrow (x+6,y)$



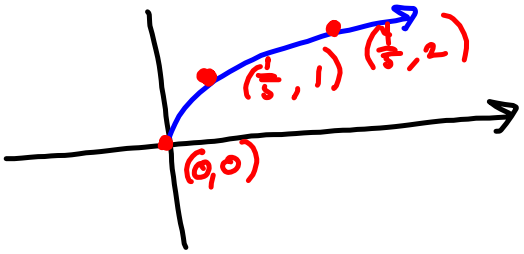
(2) $f(bx)$

$f(5x)$

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

$f(5x) = \sqrt{5x}$

Horizontal shrink / stretch / flip*.



$5x = 1$

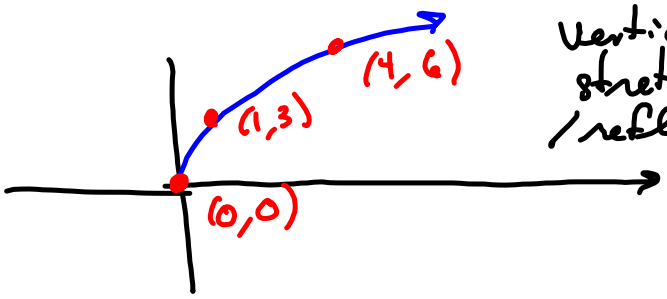
$x = \frac{1}{5}$

$\sqrt{5(\frac{4}{5})} = \sqrt{4} = 2$

ORIGINAL $f(x)$ $f(5x)$

$(x, y) \longrightarrow (\frac{1}{5}x, y)$

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



vertical stretch/shrink /reflect*

x = input = argument

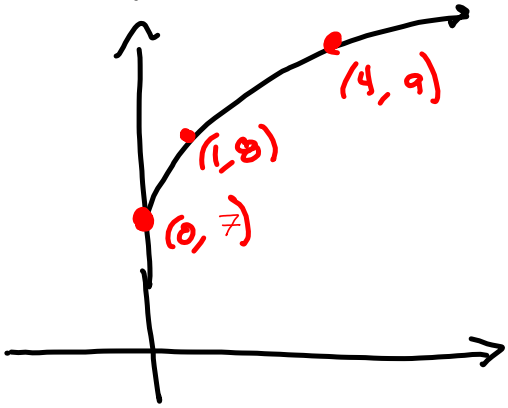
$y = f(x)$ = output

ORIGINAL $f(x)$ $3f(x)$

$(x, y) \longrightarrow (x, 3y)$

(4) $f(x) + d$

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

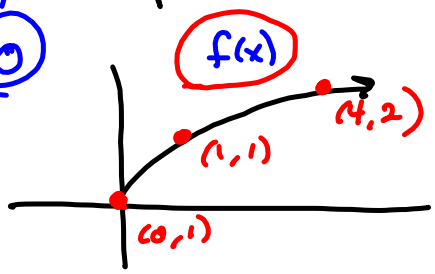


ORIGINAL $f(x)$ $f(x)+7$

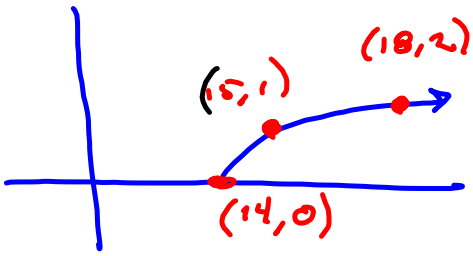
$(x, y) \longrightarrow (x, y+7)$

$g(x) = -5\sqrt{2x-14} + 3 = -5f(2x-14) + 3$

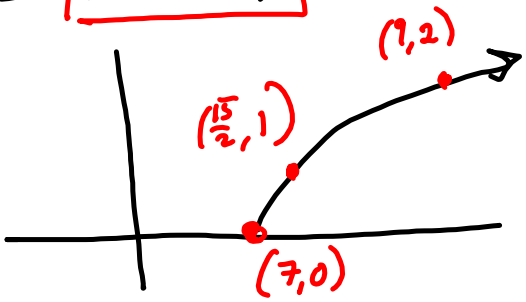
0



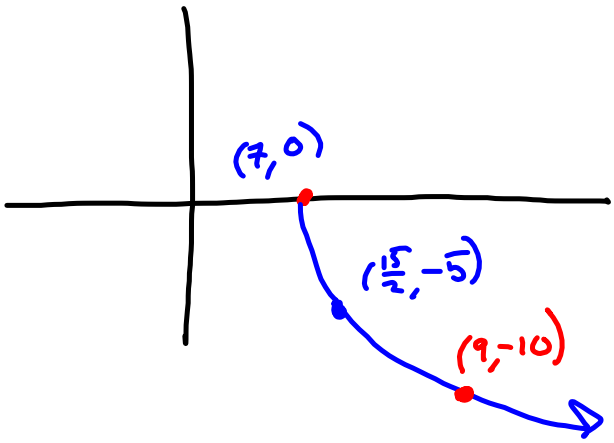
1 $f(x-14) = \sqrt{x-14}$



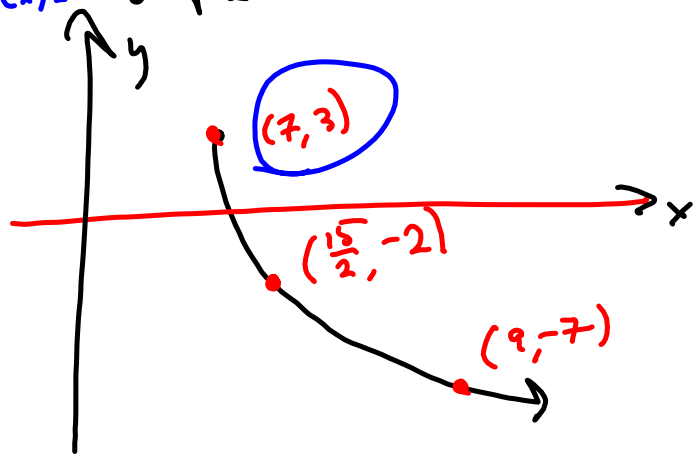
2 $f(2x-14) = \sqrt{2x-14}$



3 $-5\sqrt{2x-14} = -5f(2x-14)$

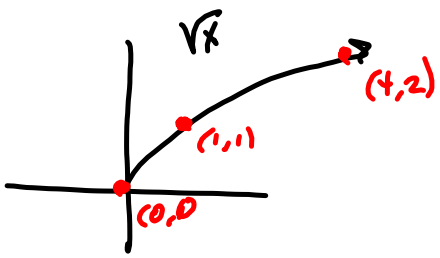


$g(x) = -5\sqrt{2x-14} + 3$

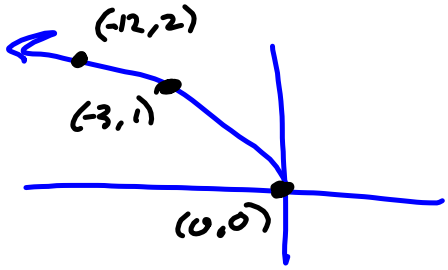


Horizontal Flip.

$\sqrt{-\frac{1}{3}x}$



$(x, y) \longrightarrow (-3x, y)$



$f(x) = 3x^2 + 2x - 1$

write in the form $f(x) = a(x-h)^2 + k$

$= a\left(x + \frac{b}{2a}\right)^2 + f\left(-\frac{b}{2a}\right)$

$a = 3, b = 2, c = -1$

$\frac{b}{2a} = \frac{2}{6} = \frac{1}{3}$

$= 3\left(x + \frac{1}{3}\right)^2 - \frac{4}{3}$

$f\left(\frac{1}{3}\right) = 3\left(\frac{1}{3}\right)^2 + 2\left(\frac{1}{3}\right) - 1$

$= 3\left(\frac{1}{9}\right) - \frac{2}{3} - 1 = \frac{1}{3} - \frac{5}{3} = -\frac{4}{3}$

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

$\frac{\frac{2}{3}}{2} = \frac{2}{3} \cdot \frac{1}{2} = \frac{1}{3}$

$f(x) = 3\left(x^2 + \frac{2}{3}x \quad\right) - 1$

$= 3\left(x^2 + \frac{2}{3}x + \left(\frac{1}{3}\right)^2\right) - 1 - 3\left(\frac{1}{3}\right)^2$

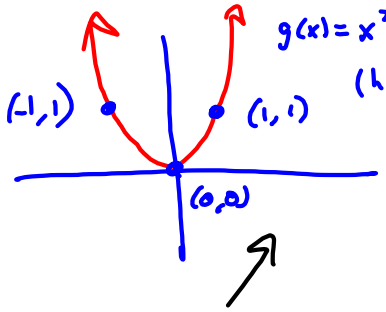
$= 3\left(x + \frac{1}{3}\right)^2 - \frac{4}{3}$

$-1 - 3\left(\frac{1}{9}\right)$

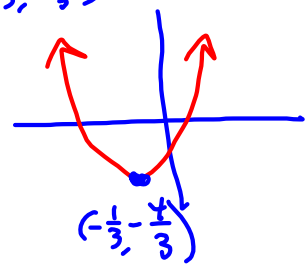
$= -1 - \frac{1}{3}$

$= -\frac{4}{3}$

$3x^2 + 2x - 1 = 3\left(x + \frac{1}{3}\right)^2 - \frac{4}{3}$



$(h, k) = \left(-\frac{1}{3}, -\frac{4}{3}\right)$



$\approx$

$=$

$(x-h)^2 + (y-k)^2 = r^2$

$(x+7)^2 + (y+13)^2 = 25$