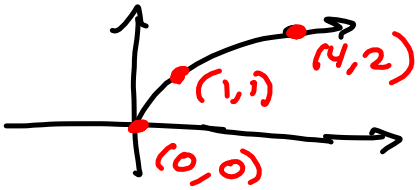
Work Problems Without Help

Toughest Part of 2.3 : $f(ax+b)$

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

$g(x) = \sqrt{3x-6}$



$\sin\left(\frac{\pi}{6}x - \frac{\pi}{4}\right)$

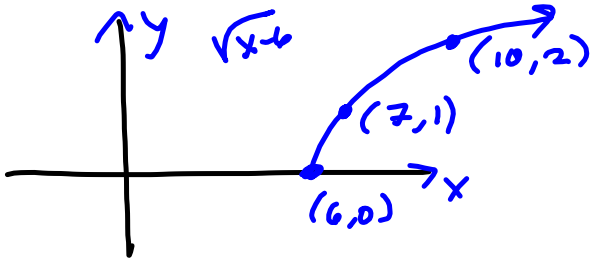
M1 M2

① $f(x-6)$ Delay

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

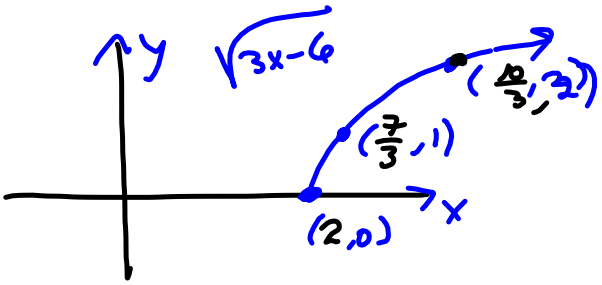
$(1,1) \to (7,1)$

① $\sqrt{x-6}$



② $f(3x-6) = \sqrt{3x-6}$

$(x,y) \to \left(\frac{1}{3}x, y\right)$



$D = [2, \infty)$

$R = [0, \infty)$

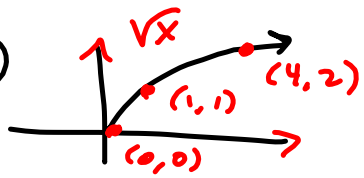
M2 $\sqrt{3x-6} = \sqrt{3(x-2)}$

① $\sqrt{3x}$ $(x,y) \longrightarrow (\frac{1}{3}x, y)$

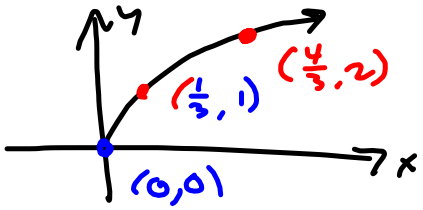
② $\sqrt{3(x-2)}$ $(x,y) \longrightarrow (x+2, y)$

BEST M2 for this

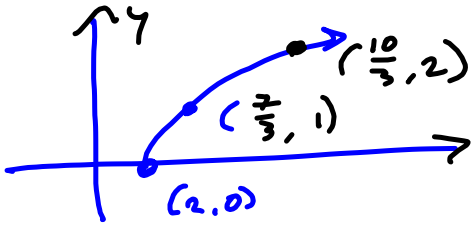
⓪

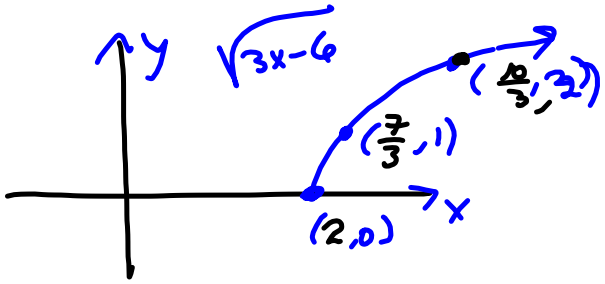


① $f(3x) = \sqrt{3x}$



② $f(3x-6)$
$= f(3(x-2)) = \sqrt{3(x-2)}$





$\frac{1}{3} + 2 = \frac{1+6}{3} = \frac{7}{3}$

$\frac{4}{3} + 2 = \frac{10}{3}$

$3f(x)$

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

$f(x)+3$

$(x,y) \to (x,y+3)$

Intuitive

ALWAYS DO $3f(x)$ before $f(x)+3$

$f(3x)$

$(x,y) \to (\frac{1}{3}x, y)$

$f(x+3)$

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

Seems "backwards," but it makes sense if you think in terms of "advance" or "delay" & "getting there" 3 times faster means you took $\frac{1}{3}$ of the time!

Preferred Sequence:

$7\sqrt{5x+15} - 13$

0) $\sqrt{x} = 7\sqrt{5(x+3)} - 13$

1) $7\sqrt{x}$ $(x,y) \to (x,7y)$

2) $7\sqrt{5x}$ $(x,y) \to (\frac{1}{5}x, y)$

3) $7\sqrt{5(x+3)}$ $(x,y) \to (x-3, y)$

4) $7\sqrt{5(x+3)} - 13$ $(x,y) \to (x, y-13)$

NEED TO FACTOR OUT THE COEFFICIENT of x, inside the func. $5x+15 = 5(x+3)$

Always do vertical shift last.