

Solutions

MCR3U – Welcome Back Quiz (Unit 2)

1. Simplify. State restrictions.

a) $\frac{24-8x}{x^2-9}$
 $= \frac{-8(x-3)}{(x-3)(x+3)}$
 $= \frac{-8}{x+3}, x \neq \pm 3$

b) $\frac{12x^2-22x+8}{3x} \div \frac{3x^2+2x-8}{2x^2+4x}$
 $= \frac{2(6x^2-11x+4)}{3x} \div \frac{3x^2+2x-8}{2x(x+2)}$
 $= \frac{2(3x-4)(2x-1)}{3x} \cdot \frac{2x(x+2)}{(x+2)(3x-4)}$
 $= \frac{4(2x-1)}{3}, x \neq -2, 0, \frac{4}{3}$

c) $\frac{x-1}{x-2} - \frac{x^2+4x-4}{x^2+4x-12}$
 $= \frac{x-1}{x-2} - \frac{x^2+4x-4}{(x+6)(x-2)}$
 $= \frac{(x+6)(x-1) - (x^2+4x-4)}{(x+6)(x-2)}$
 $= \frac{x^2+5x-6 - x^2-4x+4}{(x+6)(x-2)}$
 $= \frac{x-2}{(x+6)(x-2)} \rightarrow \frac{1}{x+6}, x \neq 2, -6$

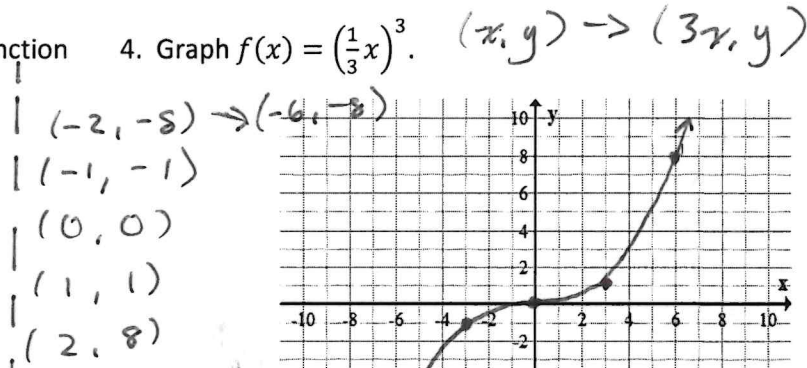
2. Given $f(x) = \sqrt{x}$, describe what transformations have occurred for the following:

a) $g(x) = \frac{1}{3}f(x)$ Vert. comp. by 3

b) $h(x) = f(10x)$ Horz. comp. by 10

3. For the function $f(x) = \frac{9}{x}$, state the base function and the transformation that has occurred.

$f(x) = \frac{1}{x}$
 $g(x) = 9f(x) = 9\left(\frac{1}{x}\right)$
 \therefore Vertical stretch by 9

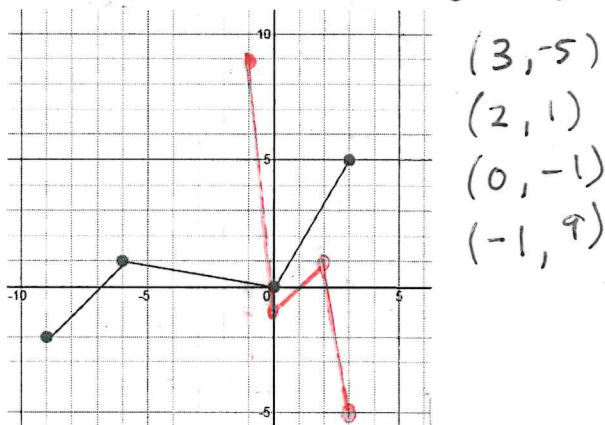


5. Given $f(x) = 25x^2$, determine a different, but equivalent transformation.

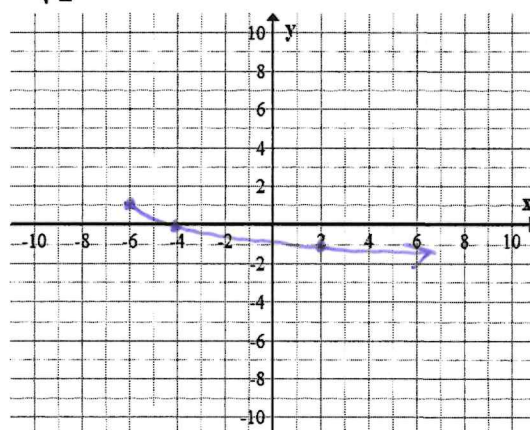
$25x^2 = (5x)^2$
 $25f(x) = f(5x)$
 \therefore A horizontal compression by 5 is equivalent to a vertical stretch by 25

6. Graph the following:

a) Given $f(x)$, graph $2f(-3x)-1$ $(x, y) \rightarrow \left(-\frac{1}{3}x, 2y-1\right)$



b) $f(x) = -\sqrt{\frac{1}{2}x+3}+1$ $(x, y) \rightarrow (2x-6, -y+1)$



c) Write the equation of the transformed function if $f(x) = \frac{1}{x}$

and the transformations on $f(x)$ are $-2f(3(x-2))+1$.

$-2f(\quad) + 1 \Rightarrow -2\left(\frac{1}{3(x-2)}\right) + 1$
 $f[3(x-2)] \Rightarrow \frac{1}{3(x-2)}$

$-2f[3(x-2)] + 1 \Rightarrow -2\left[\frac{1}{3(x-2)}\right] + 1$

$(0, 0) \rightarrow (-6, 1)$
 $(1, 1) \rightarrow (-4, 0)$
 $(4, 2) \rightarrow (2, -1)$
 $(9, 3) \rightarrow (13, -2)$