

5. Write the equation of the following functions, given the original function and the transformations performed.

a. $f(x) = \frac{1}{x}$, vertically stretched by a factor of 7, reflected in the y-axis,

translated 5 units to the right and translated 3 units downwards.

$$f(x) = 7\left(\frac{1}{x-5}\right) - 3$$

b. $f(x) = x$, horizontally compressed by a factor $\frac{1}{3}$, reflected in both the

x-axis and the y-axis, translated 11 units to the left and 4 units up.

$$f(x) = -\left(-\frac{1}{3}x + 11\right) + 4$$

c. $f(x) = \sqrt{x}$, vertically stretched by a factor of 2, horizontally stretched by a factor of 5 and translated 21 units to the right.

$$f(x) = 2\sqrt{1/5(x-21)}$$

6. State the Domain and Range for both the original function and the transformed function for each part of question 5.

	Original Domain	Original Range	Transformed Domain	Transformed Range
5a	$-\infty < x < \infty$ $x \neq 0$	$-\infty < y < \infty$ $y \neq 0$	$-\infty < x < \infty$ $x \neq 5$	$-\infty < y < \infty$ $y \neq -3$
5b	$-\infty < x < \infty$	$-\infty < y < \infty$	$-\infty < x < \infty$	$-\infty < y < \infty$
5c	$x \geq 0$	$y \geq 0$		