Name: Date: Period:

The table below describes the transformations of the parent function for radical/cubed root equations.

Transformation	f(x) Notation	Examples
Horizontal Translation Graph shifts left or right	f (x – h)	g(x) = $\sqrt{x-2}$ 2 units right g(x) = $\sqrt{x+3}$ 3 units left *If negative in front of x under radical, translation is affected. Always verify in calculator.
Vertical Translation Graph shifts up or down	f(x) + k	g(x) = $\sqrt{x}+7$ 7 units up g(x) = $\sqrt{x}-1$ 1 units down
Reflection Graph flips over x- or y-axis	f(-x) -f(x)	g(x) = $\sqrt{-x}$ reflects over **y-axis** (starting point is affected) g(x) = $-\sqrt{x}$ reflects over the x-axis
Vertical Stretch or Shrink Graph stretches away from or shrinks toward x-axis	a · f(x)	g(x) = $4\sqrt{x}$ more narrow by a factor of 4 g(x) = $\frac{1}{5}\sqrt{x}$ wider by a factor of $\frac{1}{5}$

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

Here is how the above story would be told….

- The function is reflected over the x-axis.
- The function is more narrow by a factor of 2.
- The starting point shifts 2 left and 5 down from the origin.

Watch out for the following. If you have a coefficient **under the radical, it changes different than you think:

Horizontal Stretch or Shrink Graph stretches away from or shrinks toward y-axis	f(ax)	g(x) = $\sqrt{3x}$ shrink by a factor of $\frac{1}{3}$ g(x) = $\sqrt{\frac{1}{2}x}$ stretch by a factor of 2