CCSS Advanced Algebra 3 AA2: Transformations Review Name________________________

Part 1: Write the expression that fits each blank. Then name the transformation(s).

$f(x) = x^2$ $g(x) = |x|$ $h(x) = \sqrt{x}$ $j(x) = x^3$ $k(x) = \sqrt[3]{x}$

Expression	$f(x+2) =$ ___________	$2g(x) =$ ___________	$h(x) - 4 =$ _________	$j(0.1x) =$ _________
Transformation				
Expression:	$2k(x-1) =$ ___________	$g(2x) + 4 =$ ________	$f(2(x-5)) =$ _______	$4h(x) + 3 =$ ________
Transformation				

Part 2: Write the equation for each function described below:

1. Parent *Quadratic function* ($y = x^2$) is reflected over the x-axis, translated down 4 units and left 2 units.

2. Parent *Cubic function* ($y = x^3$) is stretched vertically by a factor of 3, translated right 5 units and up 1 unit.

3. Parent *Square Root function* ($y = \sqrt{x}$) is reflected over the y-axis, compressed vertically by a factor of $\frac{1}{2}$ and translated left 4 units.

4. Parent *Cube Root function* ($y = \sqrt[3]{x}$) is reflected over the y-axis, compressed horizontally by a factor of 8 and translated up 3.

5. Parent *Absolute Value function* ($y = |x|$) is stretched vertically by a factor of 2, translated right 3 units and reflected over the x-axis.

6. Parent *Linear function* ($y = x$) is reflected over the x-axis, stretched vertically by a factor of 4 and translated right 2 units.

CCSS Advanced Algebra 3 AA2: Transformations Review Solutions

Part 1: Write the expression that fits each blank. Then name the transformation(s).

$f(x) = x^2$ $g(x) = |x|$ $h(x) = \sqrt{x}$ $j(x) = x^3$ $k(x) = \sqrt[3]{x}$

Expression	$f(x+2) = (x+2)^2$	$2g(x) = 2\|x\|$	$h(x) - 4 = \sqrt{x} - 4$	$j(0.1x) = (0.1x)^2$
Transformation	Horizontal Translations Left 2	Vertical Stretch by Factor of 2	Vertical Translation Down 4	Horizontal Stretch by Factor of 0.1
Expression:	$2k(x-1) = 2\sqrt[3]{x-1}$	$g(2x) + 4 = \|2x\| + 4$	$f(2(x-5)) = (2(x-5))^2$	$-4h(x) + 3 = 4\sqrt{x} + 3$
Transformation	Vertical Stretch by 2 and Horiztonal Translation Right 4	Horizontal Compression by 2 and Vertical Translation Up 4	Horizontal Compression by 2 and Horizontal Translation Right 5	Vertical Refletction, Vertical Stretch by 4 and Vertical Translation Up 3

Part 2: Write the equation for each function described below:

1. Parent *Quadratic function* ($y = x^2$) is reflected over the x-axis, translated down 4 units and left 2 units.
$y =- (x+2)^2 - 4$

2. Parent *Cubic function* ($y = x^3$) is stretched vertically by a factor of 3, translated right 5 units and up 1 unit.
$y = (3(x-5))^3 + 1$

3. Parent *Square Root function* ($y = \sqrt{x}$) is reflected over the y-axis, compressed vertically by a factor of $\frac{1}{2}$ and translated left 4 units.
$y = \frac{1}{2}\sqrt{-(x+4)}$

4. Parent *Cube Root function* ($y = \sqrt[3]{x}$) is reflected over the y-axis, compressed horizontally by a factor of 8 and translated up 3.
$y = \sqrt[3]{-8x} + 3$

5. Parent *Absolute Value function* ($y = |x|$) is stretched vertically by a factor of 2, translated right 3 units and reflected over the x-axis.
$y = -2|x-3|$

6. Parent *Linear function* ($y = x$) is reflected over the x-axis, dilated vertically by a factor of 4 and translated right 2 units.
$y = -4(x-2)$