

Name: Key Hour: _____ Date: _____

HONORS Transformations of Functions Test Review

DIRECTIONS: Give the name of the function family represented in each equation and describe *all* of the transformations represented.

1) $g(x) = 3\sqrt{x-4}$

Parent Function: square root

Transformation(s): stretch by 3, right 4

2) $f(x) = (x+2)^3 - 1$

Parent Function: cubic

Transformation(s): left 2, down 1

3) $h(x) = -\log(x) + 3$

Parent Function: logarithm

Transformation(s): reflect over x-axis, up 3

4) $g(x) = 5\sqrt[3]{x} - 8$

Parent Function: cube root

Transformation(s): stretch by 5, down 8

5) $f(x) = 3(x-5)^2$

Parent Function: Quadratic

Transformation(s): stretch by 3, right 5

6) $g(x) = \frac{1}{2}^{x-6} + 3$

Parent Function: Exponential Decay

Transformation(s): right 6, up 3

7) $h(x) = \log(-x+3) + 4$

Parent Function: logarithm

Transformation(s): reflect over y-axis, left 3, up 4

8) $f(x) = -2^{x-1} + 9$

Parent Function: Exponential Growth

Transformation(s): reflect over x-axis, right 1, up 9

9) $g(x) = 3\left(\frac{1}{2}\right)^{-x+7} - 1$

Parent Function: Exponential Decay

Transformation(s): stretch by 3, reflect over y-axis, left 7, down 1

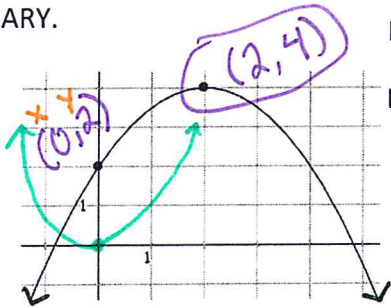
10) $h(x) = 0.7|-x+3| - 4$

Parent Function: Absolute Value

Transformation(s): compress by 0.7, reflect over y-axis, left 3, down 4

Directions: For the following graphs name the name of the function family represented, write the equation to represent the transformed function and describe *all* of the transformations. SHOW ALL WORK WHEN NECESSARY.

11)



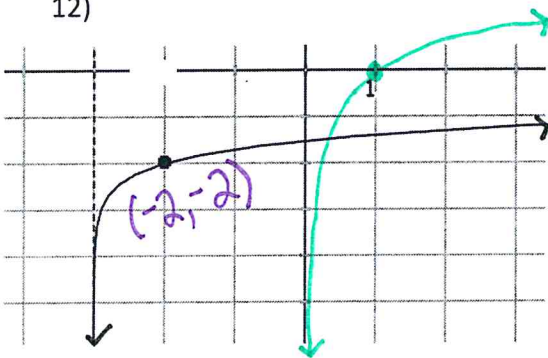
Parent Function: Quadratic; $y = x^2$

Equation: $y = a(x-2)^2 + 4$
 $2 = a(0-2)^2 + 4$
 $2 = 4a + 4$
 $-2 = 4a$
 $-1/2 = a$

$$y = -\frac{1}{2}(x-2)^2 + 4$$

Transformation(S): Reflect over x-axis, right 2, up 4

12)



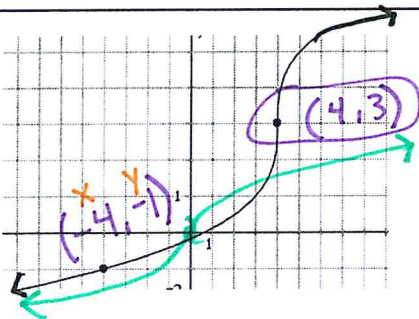
Parent Function: Logarithm; $y = \log(x)$

Equation:

$$y = \log(x+3) - 2$$

Transformation(S): left 3, down 2

13)



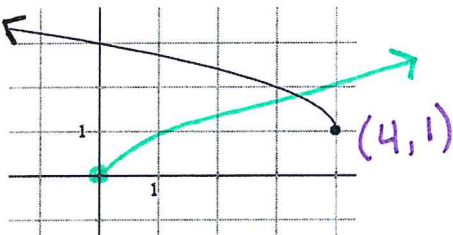
Parent Function: cube Root; $y = \sqrt[3]{x}$

Equation: $y = a\sqrt[3]{x-4} + 3$
 $-1 = a\sqrt[3]{-4-4} + 3$
 $-1 = a\sqrt[3]{-8} + 3$
 $-1 = -2a + 3$
 $-4 = -2a \rightarrow 2 = a$

$$y = 2\sqrt[3]{x-4} + 3$$

Transformation(S): stretch by 2, right 4, up 3

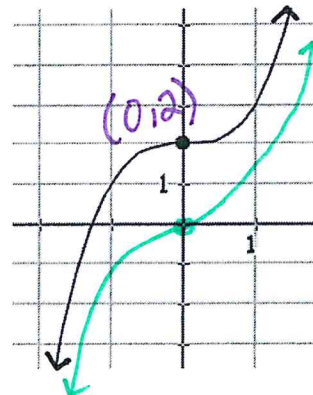
14)



Parent Function: Square Root; $y = \sqrt{x}$

Equation: $y = \sqrt{-x-4} + 1$

Transformation(S): reflect over y-axis, right 4, up 1



Parent Function: Cubic; $y = x^3$

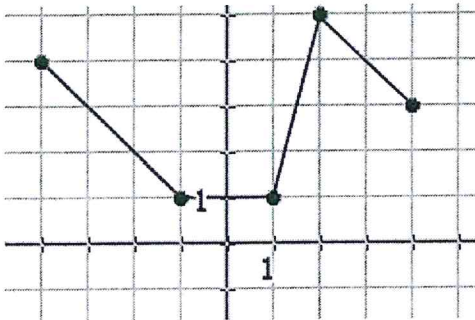
Equation:

$$y = x^3 + 2$$

Transformation(S): up 2

DIRECTIONS: Use the following arbitrary graph of $y = f(x)$ to describe the transformations and sketch a graph of the transformed function. You must show a table for each transformation.

16)

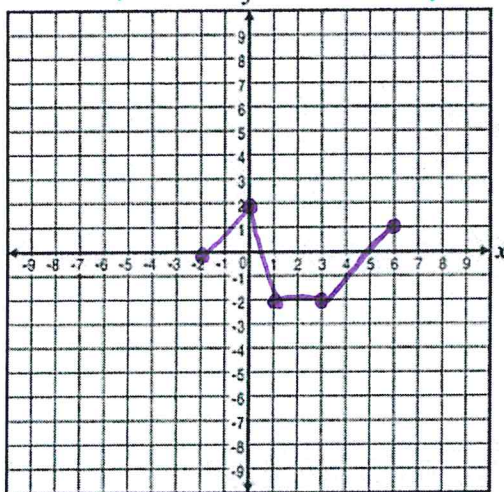


a) Create a table of values to represent this arbitrary parent function.

X	Y
-4	4
-1	1
1	1
2	5
4	3

b) $y = f(-x - 2) - 3$

reflect over y-axis, right 2, down 3



$-x + 2$

$y - 3$

$-(-4) + 2 = 4 + 2 = 6$

$4 - 3 = 1$

$-(-1) + 2 = 1 + 2 = 3$

$1 - 3 = -2$

$-(1) + 2 = -1 + 2 = 1$

$1 - 3 = -2$

$-(2) + 2 = 0 + 2 = 2$

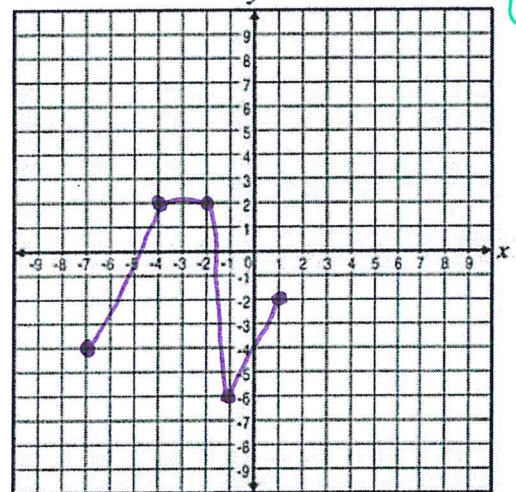
$5 - 3 = 2$

$-(4) + 2 = -2 + 2 = 0$

$3 - 3 = 0$

c) $y = -2f(x + 3) + 4$

reflect over x-axis, stretch by 2, left 3, up 4



$x - 3$

$-2y + 4$

$-4 - 3 = -7$

$-2(4) + 4 = -8 + 4 = -4$

$-1 - 3 = -4$

$-2(1) + 4 = -2 + 4 = 2$

$1 - 3 = -2$

$-2(1) + 4 = -2 + 4 = 2$

$2 - 3 = -1$

$-2(5) + 4 = -10 + 4 = -6$

$4 - 3 = 1$

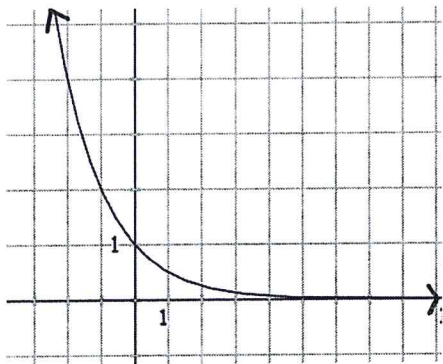
$-2(3) + 4 = -6 + 4 = -2$

*** DON'T FORGET TO DESCRIBE THE TRANSFORMATIONS AND MAKE A TABLE FOR PARTS B & C ***

Content from the Parent Functions Unit

Identify the parent function and each of the key features listed for each graph. (YES, YOU WILL SEE THIS ON THE TEST.)

17)



Function Family: *Exponential Decay*

Domain: $(-\infty, +\infty)$

Range: $(0, +\infty)$

Increasing Interval: *N/A*

Decreasing Interval: $(-\infty, +\infty)$

Positive Interval: $(-\infty, +\infty)$

Negative Interval: *N/A*

x-intercepts: *none*

y-intercepts: $(0, 1)$

Max/Min: *none*

Asymptotes: $y = 0$

End-Behavior:

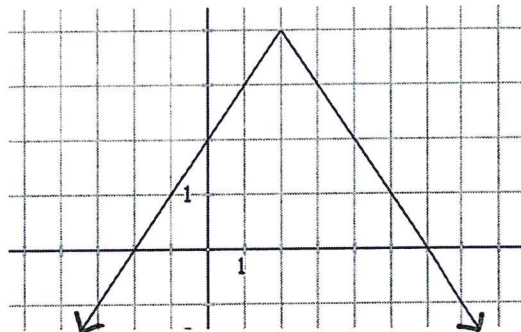
Left:

$x \rightarrow -\infty$
 $y \rightarrow +\infty$

Right:

$x \rightarrow +\infty$
 $y \rightarrow 0$

18)



Function Family: *Absolute Value*

Domain: $(-\infty, +\infty)$

Range: $(-\infty, 4]$

Increasing Interval: $(-\infty, 2)$

Decreasing Interval: $(2, +\infty)$

Positive Interval: $(-2, 6)$

Negative Interval: $(-\infty, -2) \cup (6, +\infty)$

x-intercepts: $(-2, 0), (6, 0)$

y-intercepts: $(0, 2)$

Max/Min: *max*: $(2, 4)$

Asymptotes: *none*

End-Behavior:

Left:

$x \rightarrow -\infty$
 $y \rightarrow -\infty$

Right:

$x \rightarrow +\infty$
 $y \rightarrow -\infty$