Name: Key Hour: _____ Date: _____________

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) $h(x) = -|x| + 3$

Parent Function: absolute value

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) $h(x) = (x+3)^3 + 4$

Parent Function: Cubic

Transformation(s): 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) $g(x) = 3x - 7$

Parent Function: linear

Transformation(s): stretch by 3, down 7

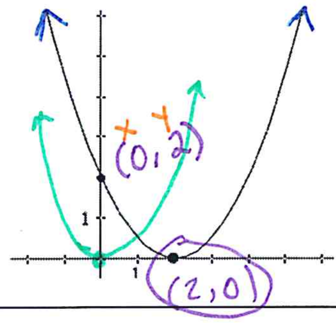
10) $h(x) = 0.7|-x+3| - 4$

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:

$y=a(x-2)^2$

$2=a(0-2)^2$

$2=a(-2)^2$

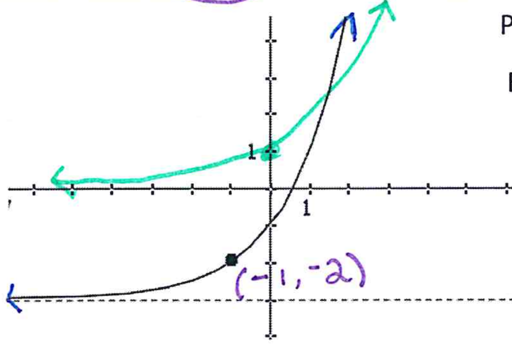
$\frac{2}{4}=\frac{4a}{4}$

$\frac{1}{2}=a$

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

Transformation(S): Compress by $\frac{1}{2}$, right 2

12)



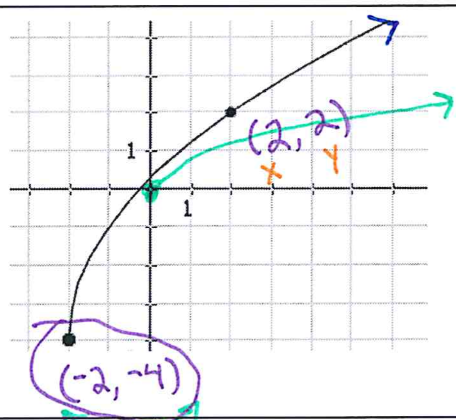
Parent Function: exponential growth; $y=2^x$

Equation:

$\boxed{y=2^{x+1}-3}$

Transformation(S): left 1, down 3

13)



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

Equation:

$y=a\sqrt{x+2}-4$

$2=a\sqrt{2+2}-4$

$2=a\sqrt{4}-4$

$2=2a-4$

$2=2a\cancel{-4}$

$+4 \quad \cancel{+4}$

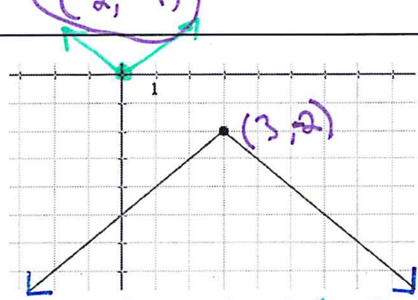
$\frac{6}{2}=\frac{2a}{2}$

$3=a$

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

Transformation(S): Stretch by 3, left 2, down 4

14)

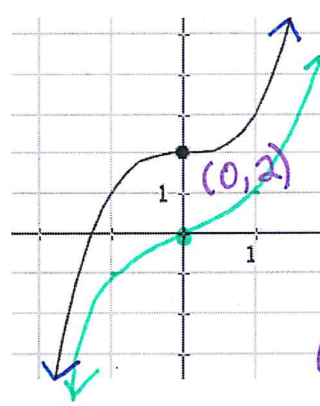


Parent Function: absolute value; $y=|x|$

Equation: $\boxed{y=-|x-3|-2}$

Transformation(S): Right 3, down 2, reflect over the x-axis

15)

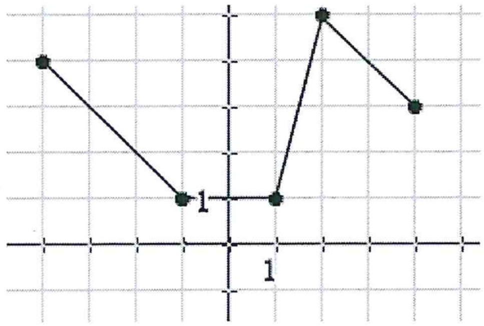


Parent Function: cubic; $y=x^3$

Equation: $\boxed{y=x^3+2}$

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.*

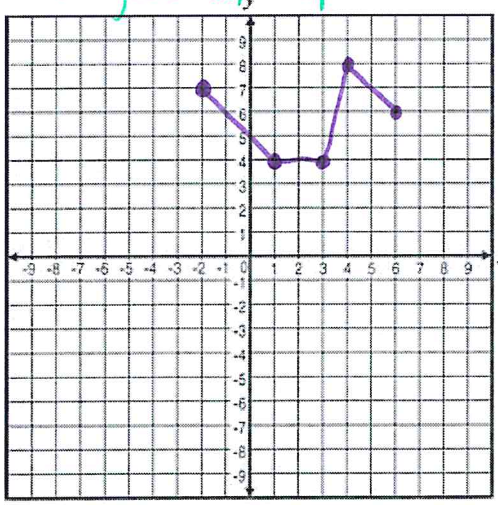
16) 

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

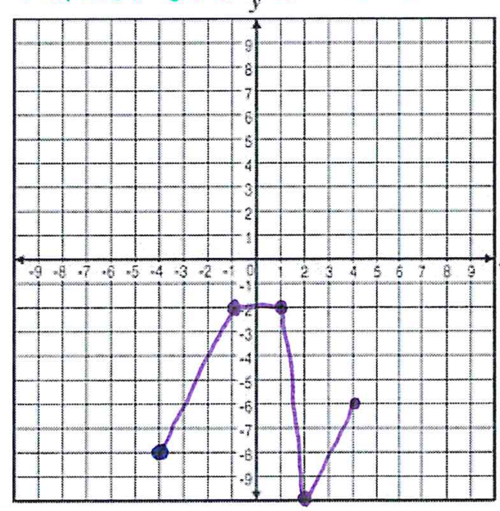
right 2, up 3



X + 2	Y + 3
-4+2 = -2	4+3 = 7
-1+2 = 1	1+3 = 4
1+2 = 3	1+3 = 4
2+2 = 4	5+3 = 8
4+2 = 6	3+3 = 6

c) $y = -2f(x)$

reflect over x-axis, stretch by 2



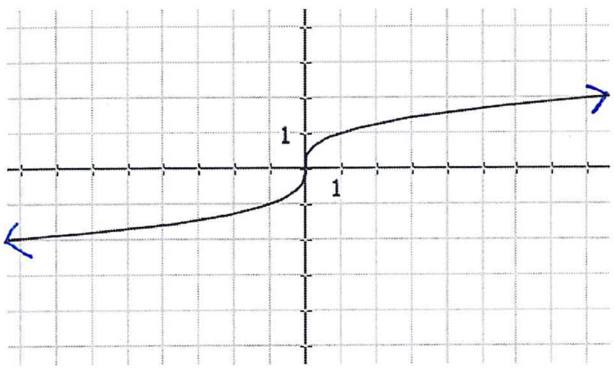
X	-2Y
-4	-2(4) = -8
-1	-2(1) = -2
1	-2(1) = -2
2	-2(5) = -10
4	-2(3) = -6

*** 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: cubic root

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

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

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

Decreasing Interval: N/A

x-intercepts: $(0, 0)$

y-intercepts: $(0, 0)$

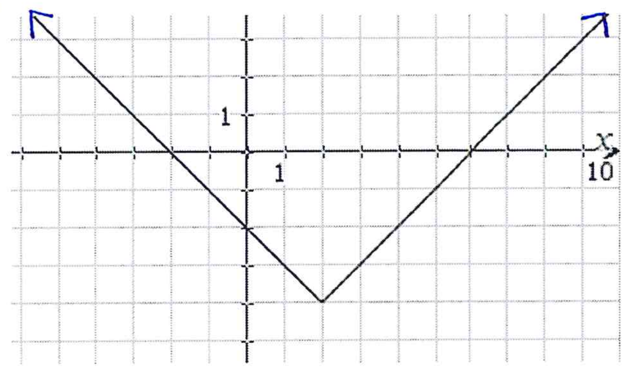
Asymptotes: none

End-Behavior:

Left:
$x \to -\infty$
$y \to -\infty$

Right:
$x \to +\infty$
$y \to +\infty$

18)



Function Family: absolute value

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

Range: $[-4, +\infty)$

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

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

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

y-intercepts: $(0, -2)$

Asymptotes: none

End-Behavior:

Left:
$x \to -\infty$
$y \to +\infty$

Right:
$x \to +\infty$
$y \to +\infty$