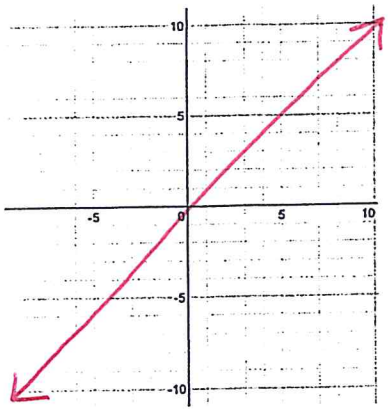
Name: _____ Hour: _____

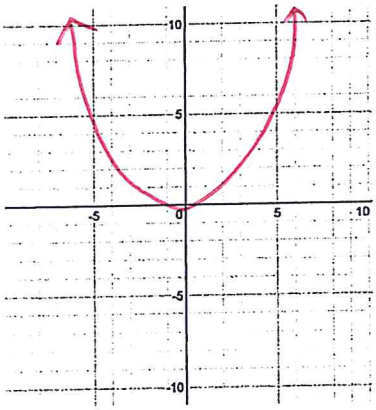
Family Functions Part 2 - Study Guide

Write the equation of the ~~transformed~~ parent functions ~~(with a, h, k – values)~~ and sketch its graph.

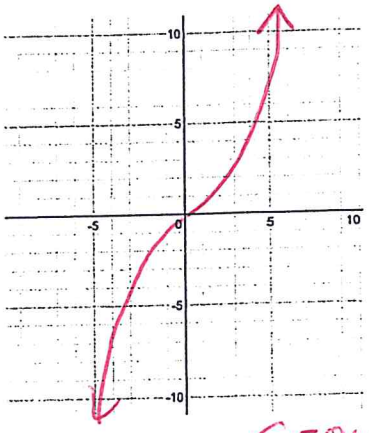
Linear
Equation: $f(x) = x$



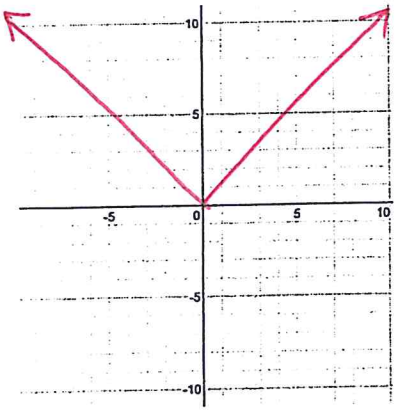
Polynomial Even
Equation: $f(x) = x^2$



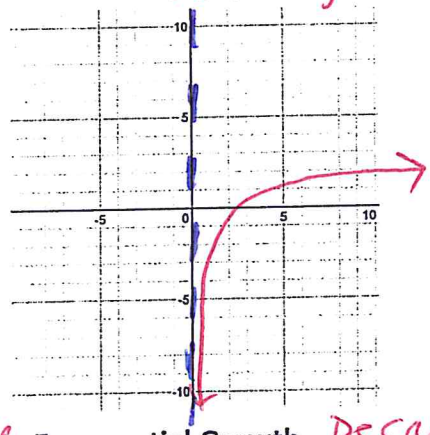
Polynomial Odd
Equation: $f(x) = x^3$



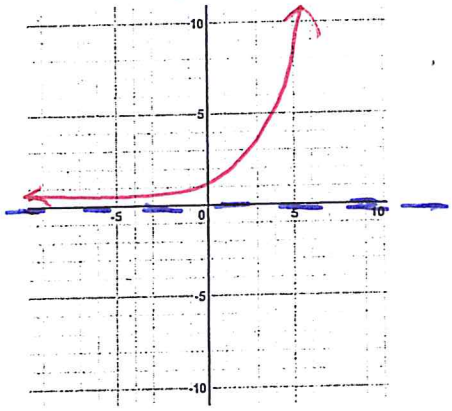
Absolute Value
Equation: $f(x) = |x|$



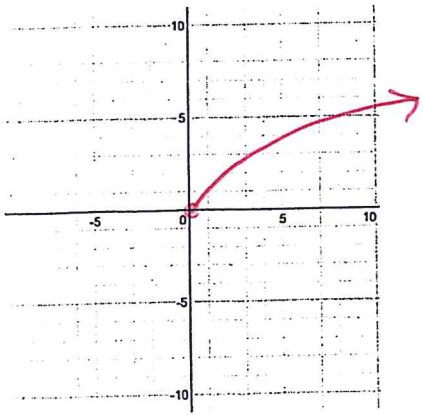
Log ~~arithm~~
Equation: $f(x) = \log x$



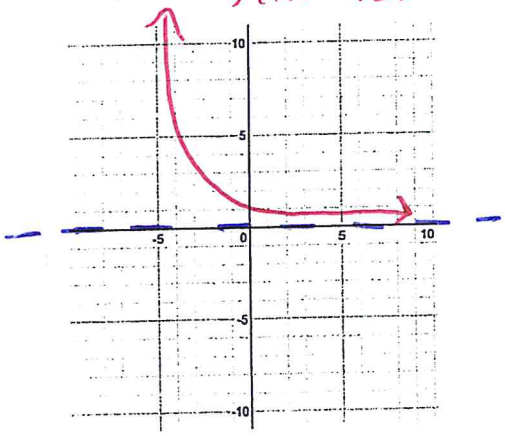
* **Exponential ~~Decay~~ Growth**
Equation: $f(x) = 2^x$



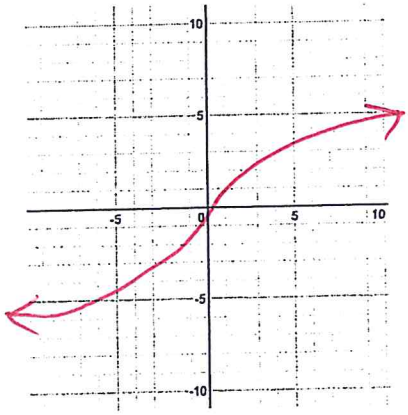
Radical Even
Equation: $f(x) = \sqrt{x}$



* **Exponential ~~Growth~~ Decay**
Equation: $f(x) = (\frac{1}{3})^x$



Radical Odd
Equation: $f(x) = \sqrt[3]{x}$



For #1 – 8 give the parent function name and equation, all a, h, and k values with their transformations.

1. $f(x) = 3\log(x + 1) + 6$

~~Parent~~ Family Function Name: Logarithm Parent Function Equation: $f(x) = \log x$

a – value: 3 Transformation(s): Vertical stretch of 3

h – value: -1 Transformation: Translation 1L

k – value: 6 Transformation: Translation 6U

2. $g(x) = 0.4\sqrt[3]{x - 2}$

~~Parent~~ Family Function Name: Radical Odd Parent Function Equation: $f(x) = \sqrt[3]{x}$

a – value: .4 Transformation(s): Vertical shrink of .4 or 2/5

h – value: 2 Transformation: Translation 2R

k – value: 0 Transformation: —

3. $f(x) = -2x + 5$

~~Parent~~ Family Function Name: Linear Parent Function Equation: $f(x) = x$

a – value: -2 Transformation(s): Vertical Reflection, Vertical Stretch of 2

h – value: 0 Transformation: —

k – value: 5 Transformation: Translation 5U

4. $f(x) = -\frac{2}{3}(x + 7)^2 - 4$

~~Parent~~ Family Function Name: Polynomial even Parent Function Equation: $f(x) = x^2$

a – value: -2/3 Transformation(s): Vertical reflection, Vertical shrink of 2/3

h – value: -7 Transformation: Translation 7L

k – value: -4 Transformation: Translation 4D

5. $g(x) = \frac{1}{2}^{(x-3)} - 1$

~~Parent~~ Function Name: Family Exponential Decay

Parent Function Equation: $f(x) = (\frac{1}{2})^x$

a – value: 1 Transformation(s): —

h – value: 3 Transformation: Translation 3R

k – value: -1 Transformation: Translation 1D

6. $g(x) = 2^{(x-5)} - 6$

~~Parent~~ Function Name: Family Exponential Growth

Parent Function Equation: $f(x) = 2^x$

a – value: 1 Transformation(s): —

h – value: 5 Transformation: Translation 5R

k – value: -6 Transformation: Translation 6D

7. $g(x) = 0.4(x - 2)^3$

~~Parent~~ Function Name: Polynomial odd Parent Function Equation: $f(x) = x^3$

a – value: .4 Family Transformation(s): Vertical Shrink of .4

h – value: 2 Transformation: Translation 2R

k – value: 0 Transformation: —

8. $f(x) = -\frac{1}{5}|x + 3| - 2$

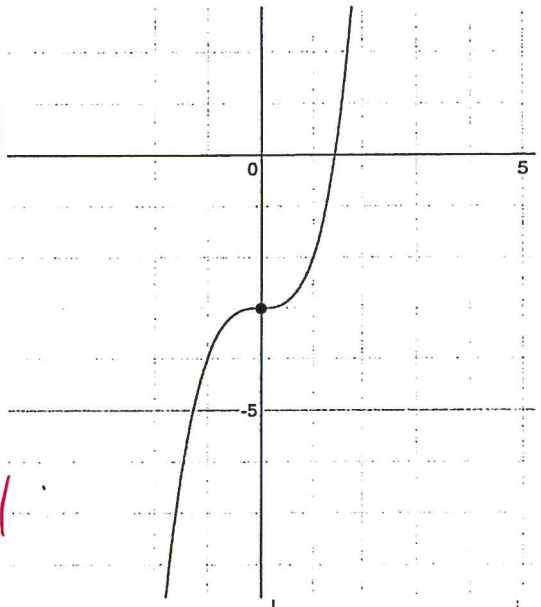
~~Parent~~ Function Name: family Absolute Value Parent Function Equation: $f(x) = |x|$

a – value: -1/5 Transformation(s): Vertical Reflection, vertical shrink of 1/5

h – value: -3 Transformation: Translation 3L

k – value: -2 Transformation: Translation 2D

Find the transformed equation by using all the information from the graph and find the a-value. SHOW ALL WORK ******** If you are given only one point, that is the major point and the a value is 1 . If you have two points then you must solve for a – value.**



9. Family Name: Polynomial Odd $f(x)=x^3$

a – value: 1 (2 points are not given!)

h – value: 0

k – value: -3 Translation 3D

Transformation Equation: $f(x) = x^3 - 3$

10. Family Name: Absolute Value $f(x)=|x|$

a – value: ?

h – value: 0

k – value: 2

Translation 2U

$y = a|x-h|+k$

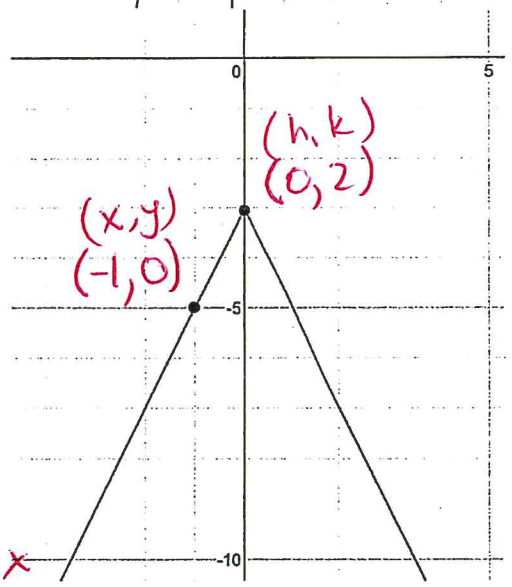
$0 = a|-1-0|+2$

$0 = a|-1|+2$

$0 = 1a+2$

$-2 \quad -2$

$a = -2$



Transformation Equation: $f(x) =$

$f(x) = -2|x-0|+2$

$f(x) = -2|x|+2$

11. Family Name: Exponential Growth, $f(x)=2^x$

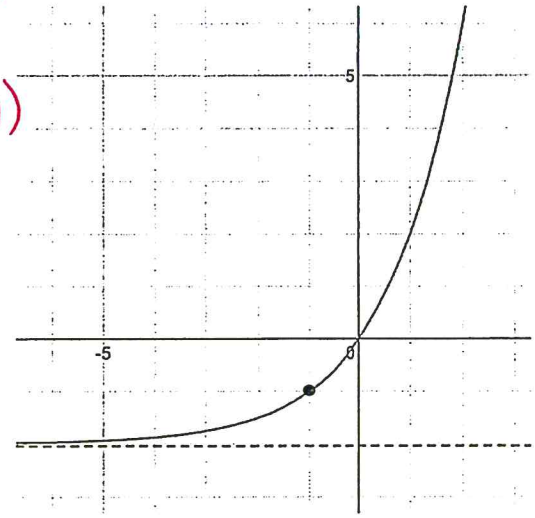
a – value: 1 (2 points are not given!)

h – value: -1

k – value: -2

$(0,1) \rightarrow (-1,-1)$

Translated 1L, 2D



Transformation Equation: $f(x) = 2^{(x--1)}+-2$

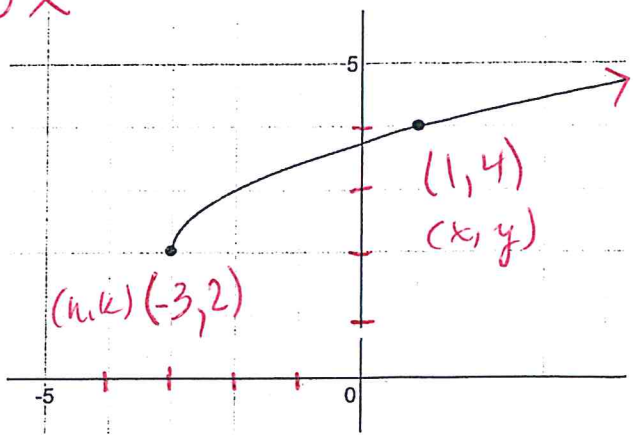
$f(x) = 2^{x+1} - 2$

12. Family Name: Radical Even – $f(x)=\sqrt{x}$

a – value: ?

h – value: -3 Translated 3L, 2U

k – value: 2



Transformation Equation: $f(x) = a\sqrt{x-h}+k$

$4 = a\sqrt{1--3}+2$

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

$4 = 2a+2$

$-2 \quad -2$

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

$a = 1$

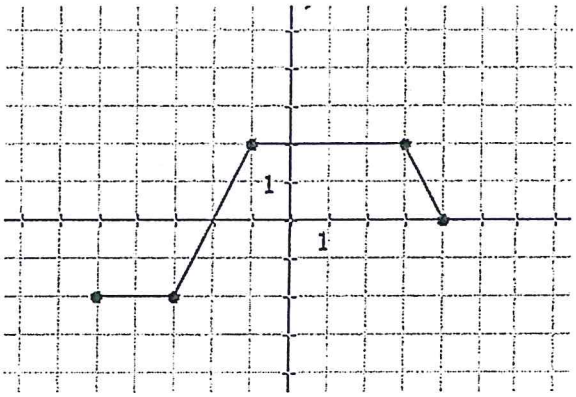
$f(x) = \sqrt{x--3}+2$

$f(x) = \sqrt{x+3}+2$

Use the following arbitrary graph of $y = f(x)$ to describe the transformations and sketch a graph of the transformed function.

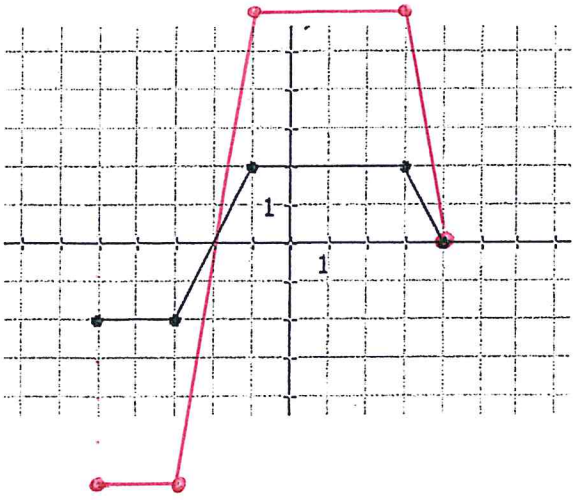
13. Transform the arbitrary function in "a" for questions b and c.

a. Create a table to represent this arbitrary function.



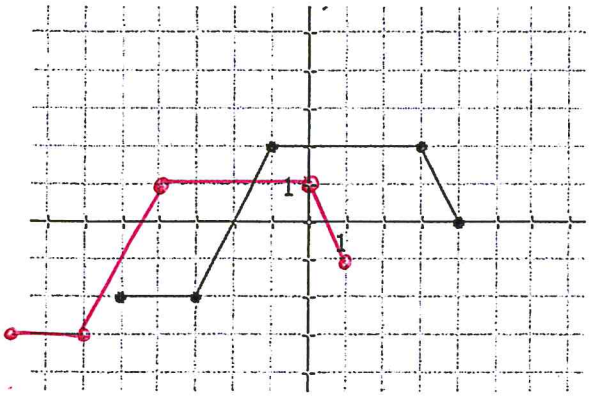
x	Y
-5	-2
-3	-2
-1	2
3	2
4	0

b. $m(x) = 3f(x)$ $a=3, h=0, k=0$ Vertical Stretch of 3



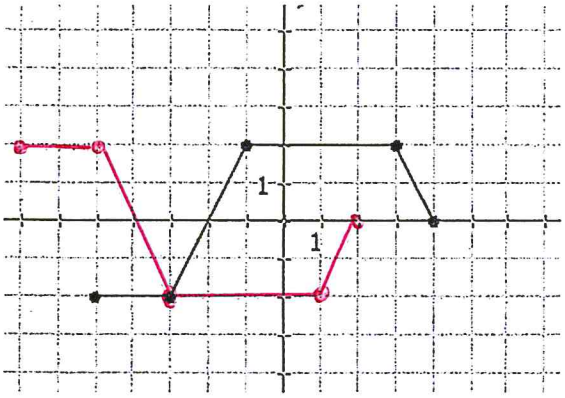
x	3Y
-5	-6
-3	-6
-1	6
3	6
4	0

c. $g(x) = f(x + 3) - 1$ $a=1, h=-3, k=-1$ Translation 3L, 1D



x-3	y-1
-8	-3
-6	-3
-4	1
0	1
1	-1

d. $g(x) = -f(x + 2)$ $a=-1, h=-2, k=0$ Vertical Reflection Translation 2D



x	-y
-5	2
-3	2
-1	-2
3	-2
4	0

x-2	y
-7	2
-5	2
-3	-2
1	-2
2	0