NC Math 3 Function Test Review Name: _____ A#____

1.

a) Function Family:

b) Equation of Parent Function:

c) Vertical translation: _____ units up or down

d) Horizontal translation: ____ units left or right

e) Reflection over *x*-axis or *y*-axis?

f) Equation of Function: $f(x)$ =

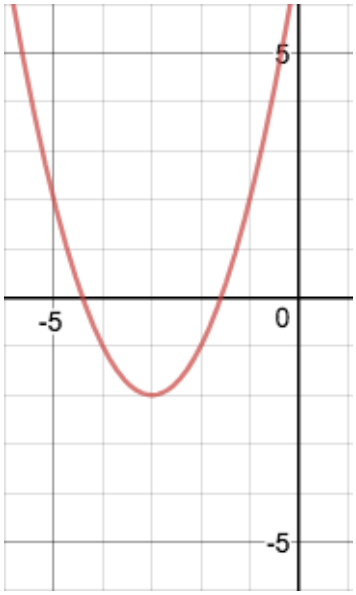
g) Domain:

h) Range:

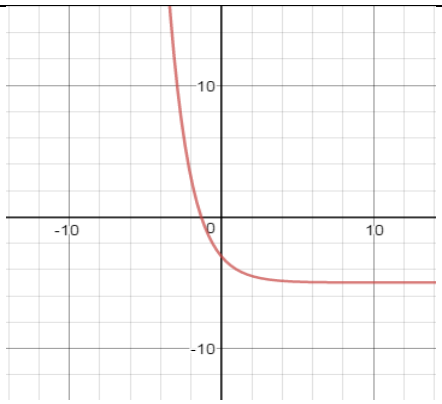
i) End behavior:

As $x \to \infty$, $f(x) \to$

As $x \to -\infty$, $f(x) \to$



2.



a) Function Family:

b) Equation of Parent Function: $f(x) = 2\left(\frac{1}{4}\right)^x$

c) Vertical translation: _____ units up or down

d) Horizontal translation: ____ units left or right

e) Reflection over *x*-axis or *y*-axis?

f) Equation of Function: $f(x)$ =

g) Domain:

h) Range:

i) End behavior:

3.

a) Function Family:

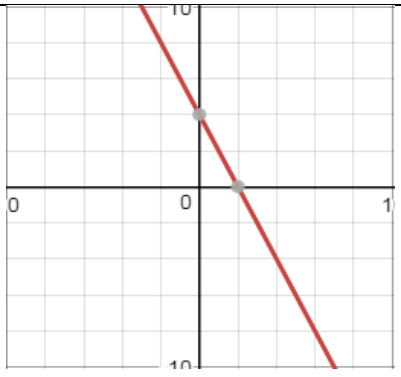
b) Equation of Parent Function:

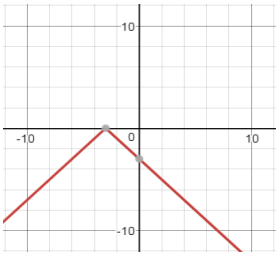
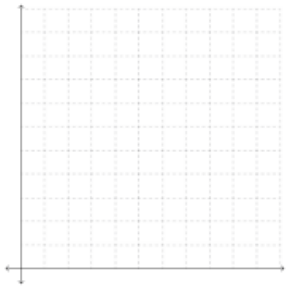
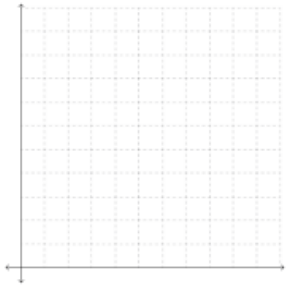
c) Equation of Function: $f(x)$ =

d) Domain:

e) Range:

f) End behavior:

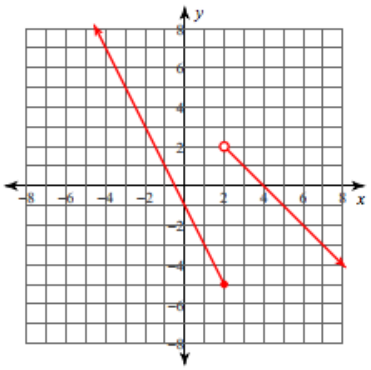
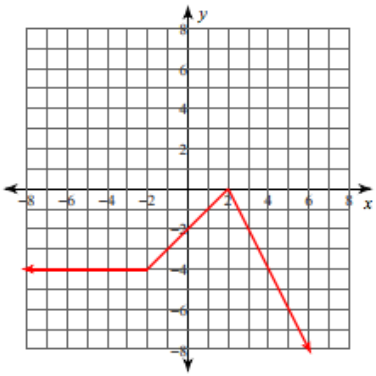
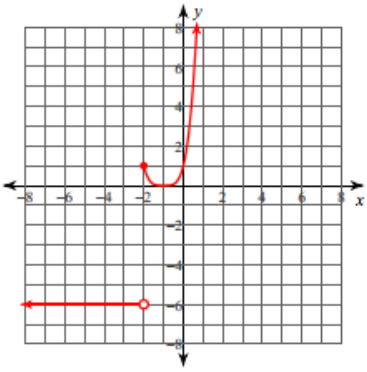


4.	The parent function for the graph to the right is $f(x) = \|x\|$. Alter the equation of the parent function to represent any translation(s), reflection, stretch or compression. 
5.	Describe the transformation of $f(x) = \sqrt{x-3}$ from the parent function.
6.	The Wertz car rental company charges \$27 to rent a crossover, plus \$22 per day. (Assume a partial day pays a partial fee.) What type of function could be used to represent the cost of renting the car, *c*, as a function of the number of days rented, *d*? Make a rough sketch of the graph of this situation. Be sure to label both axes. 
7.	A U.S. Marshal needs to travel 160 miles across state lines to retrieve an escaped convict. What type of function could be used to represent the time(*t*) in hours that it takes the Marshal to arrive as function of the speed (*s* in mph) at which he drives? Make a rough sketch of the graph of this situation. Be sure to label both axes 
8.	The admission rates for an amusement park are as follows: • Children 5 years old and under - FREE • Children between 5 years and 12 years - \$10 • Children between 12 years and 18 years - \$25 • Adults (18 years and above) - \$35 Write a piecewise function that gives the admission price for a given age.

9.	Write a piecewise function that describes the situation. For a cellular data plan, $50 per month buys 400 minutes. Additional time cost $0.30 per minute. Let the monthly cost C(x) be the function of the time x.
10.	For the following function, $f(x) = \begin{cases} x^2 - 1, & x \leq 0 \\ 2x - 1, & 0 < x \leq 5 \\ 3, & x > 5 \end{cases}$ Evaluate f(-2) + f(0) – f(5).
11.	Solve each inequality and graph it's solution on a number line. a) $\lvert 7x + 4 \rvert \geq 74$ b) $\frac{\lvert 2+3x \rvert}{2} \geq 5$ c) $7\left\lvert \frac{x}{3} \right\rvert - 9 < 12$

12. Match the following piecewise functions to their graphs.

Function A = Graph _____ Function B = Graph _____ Function C = Graph _____

A	B	C
$f(x) = \begin{cases} -6, & x < -2 \\ (x+1)^4, & x \geq -2 \end{cases}$	$f(x) = \begin{cases} -2x - 1, & x \leq 2 \\ -x + 4, & x > 2 \end{cases}$	$f(x) = \begin{cases} -4, & x \leq -2 \\ x - 2, & -2 < x < 2 \\ -2x + 4, & x \geq 2 \end{cases}$
1 	2 	3 

13. Find the solution(s) to the following system: $\begin{cases} f(x) = x^2 + 3x + 2 \\ g(x) = 2x + 3 \end{cases}$

14. Let x represent one number and let y represent another number. Use the given conditions to write a system of nonlinear equations. Solve the system and find the numbers.

The sum of two numbers is 20 and their product is 96.

15. A house that costs $200,000 will appreciate in value by 3% each year.
Using the function, $f(x) = 200{,}000(1.03)^x$, determine when the house will be worth $300,000.