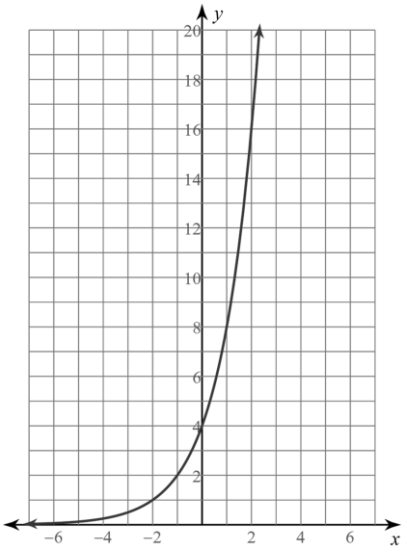
 Name: _____

5.4.D2 – REFLECTIONS OF EXPONENTIAL FUNCTIONS

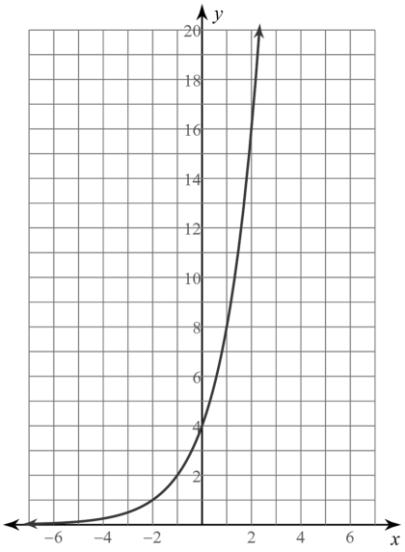
Past due on: _____ Period: _____

The graph of the function $f(x) = 4(2)^x$ is given. Describe the transformations of $g(x)$ and then sketch its graph. *Refer to the 5.3 examples "Translating Exponential Functions Vertically & Horizontally" and the 5.4 example "Reflecting Exponential Functions" in the Chapter 5 Summary.*

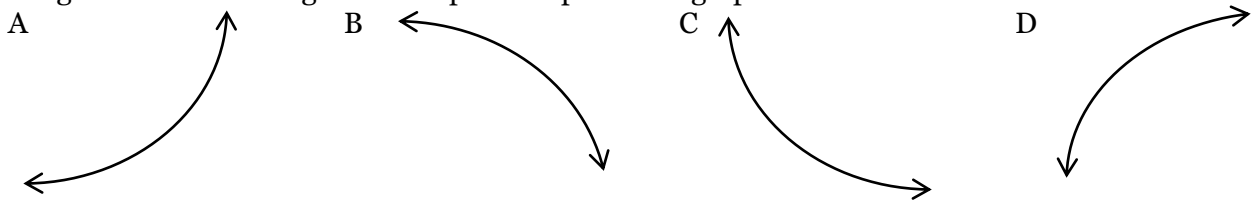
1. $g(x) = f(-x)$



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



The diagram below shows general shapes of exponential graphs.



3. Think about the shape of the graph of an exponential function of the form $y = a(b)^x$ and the values of a and b: Is a positive or negative? Is $b > 1$ or $0 < b < 1$? Describe the values of a and b for each graph shape given.

	GRAPH A	GRAPH B	GRAPH C	GRAPH D
a				
b				

Identify, by letter, the shape of the graph for each function.

4. $f(x) = -4^x$
5. $g(x) = 5^x$
6. $h(x) = 0.3^x$
7. $p(x) = -\left(\frac{1}{2}\right)^x$
8. $q(x) = 3\left(\frac{1}{10}\right)^x$
9. $r(x) = -\frac{1}{5}(3)^x$

10. A function has the following points: $G(1,-5), H(3,-3), \& I(5,-3)$ and has been translated 6 units left and 1 unit up. What are the coordinates of the new points?

11. A function has the following points $K(-5,-5), L(5,-4), \& I(-2,-4)$ and has been reflected over the y-axis. What are the coordinates of the new points?

12. A function has the following points $R(-5,0), S(-3,1), \& T(-4,-4)$ and has been reflected over the x-axis and shifted left 2 units. What are the coordinates of the new points?

Problems 13 – 20: *Linear or Exponential?* For the linear set, write a linear function of the form $y = mx + b$; for the exponential set, write an exponential equation of the form $y = a(b)^x$.

13. A population has size 5000 at time $t = 0$, with t in years.
    a. If the population decreases by 100 people per year, find a function formula for the population, P, at time t.
    b. If the population decreases by 8% per year, find a function formula for the population, P, at time t.

14. Write a linear or exponential function formula for the price p of a gallon of gas in t days if the price is \$2.50 on day $t = 0$ and the price is…
    a. Increasing by \$0.03 per day.
    b. Decreasing by \$0.07 per day.
    c. Increasing by 2% per day.
    d. Decreasing by 4% per day.

Examine the output pattern to determine which of the following data sets are linear and which are exponential. For the linear set, write a linear function of the form $y = mx + b$; for the exponential set, write an exponential equation of the form $y = a(b)^x$.

15.

x	-2	-1	0	1	2	3	4
y	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27	81

16.

x	-2	-1	0	1	2	3	4
y	2	2.5	3	3.5	4	4.5	5

17.

x	-2	-1	0	1	2	3	4
y	0.75	1.5	3	6	12	24	48

18.

x	-2	-1	0	1	2	3	4
y	0.50	2	8	32	128	512	2048

19.

x	-2	-1	0	1	2	3	4
y	6.25	2.5	1	0.4	0.16	0.064	0.0256

20.

x	-2	-1	0	1	2	3	4
y	2.5	3.75	4	5.25	6.50	7.75	8