Name: _____

5.3.D2 – TRANSLATIONS OF EXPONENTIAL FUNCTIONS

Past due on: _____ Period: _____

Each coordinate plane shows the graph of $f(x)$. Sketch the graph of $g(x)$. Identify the asymptote, domain, and range for the function. *Refer to the 5.2 example "Graphing & Analyzing Exponential Functions" and the 5.3 example "Translating Linear & Exponential Functions in Terms of the Basic Function" in the Chapter 5 Summary.*
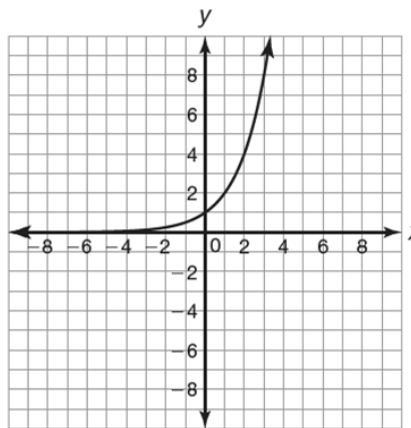
1. $g(x) = f(x - 3)$
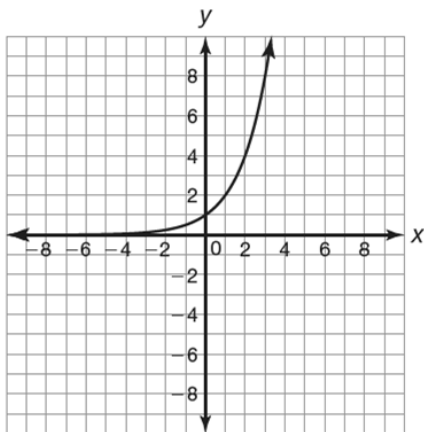
asymptote: _____

domain: _____
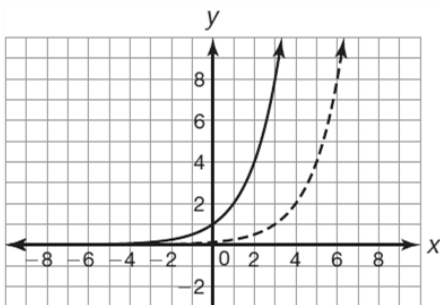
range: _____

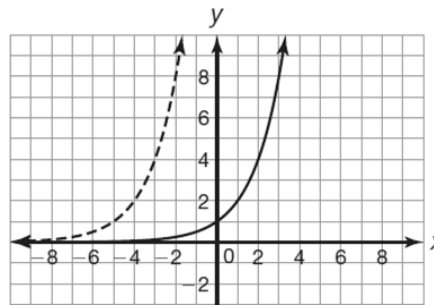2. $g(x) = f(x + 4)$

asymptote: _____

domain: _____

range: _____

Each graph shows the function $g(x)$ as a translation of the function $f(x)$. Write the equation of $g(x)$.

3.

4.

5. The points $(-5, 0), (-3, 4), (0, 7)$ & $(1, 9)$ are on the graph of f. The graph of g is the translation of the graph of f shifted down 4 units and right 1 unit.

   a. Represent the translation using coordinate notation: $(x, y) \rightarrow$ _____
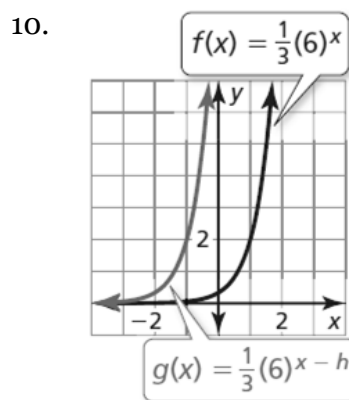
   b. What points are on the graph of g?

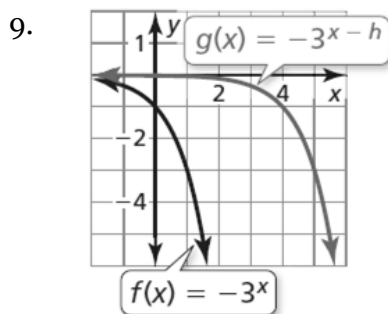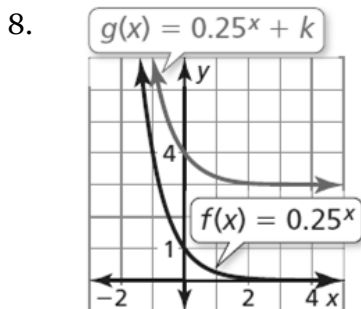 $(-9, 1)$ \qquad $(-4, -4)$ \qquad $(-3, 8)$ \qquad $(-2, 0)$ \qquad $(1, 3)$ \qquad $(2, 5)$

6. Let $(3, -4)$ be a point on the graph of f and let $g(x) = f(x - 3) + 5$. What is a point on the graph of g? Explain how you found your answer.

7. Let $f(x) = 6^x$. Represent the translation using coordinate notation and write an equation for g for each translation of f described in the table.

Translation of f	Coordinate notation of g	Equation of g
Shift up 5 units		
Shift down 3 units		
Shift left 2 units		
Shift right 4 units		
Shift up 8 units and left 3 units		
Shift down 4 units and right 7 units		

Compare the graphs of $f(x)$ & $g(x)$. Find the value of h or k.

8.
$g(x) = 0.25^x + k$

$f(x) = 0.25^x$

9.
$g(x) = -3^{x-h}$

$f(x) = -3^x$

10.
$f(x) = \frac{1}{3}(6)^x$

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

Write a system of inequalities to represent each situation. *Refer to the 7.2 example "Writing a System of Linear Inequalities" in the Chapter 7 Summary.*

11. A surf shop makes $150 per surfboard and $100 per wakeboard and has a sales goal of at least $2000 in a month. The shop owner sells at least 30 boards each month. Let x = the number of surfboards and y = the number of wakeboards.

    Inequality 1: _____ & Inequality 2: _____

12. At her party, Alice is serving pepper jack cheese and cheddar cheese. She wants to have at least 4 pounds of cheese. Pepper jack cheese costs $4/pound and cheddar cheese costs $2/pound and Alice has at most $20 to spend on cheese. Let x = the pounds of pepper jack cheese and y = the pounds of cheddar cheese.

    Inequality 1: _____ & Inequality 2: _____

13. Pablo's pickup truck can carry a maximum of 1000 pounds. He is loading his truck with 20-pound bags of cement and 80-pound bags of cement. He hopes to load at least 10 bags of cement into his truck. Let x = the number of 20-pound bags of cement & let y = the number of 80-pound bags of cement.

    Inequality 1: _____ & Inequality 2: _____

Chapter 5: Exponential Functions