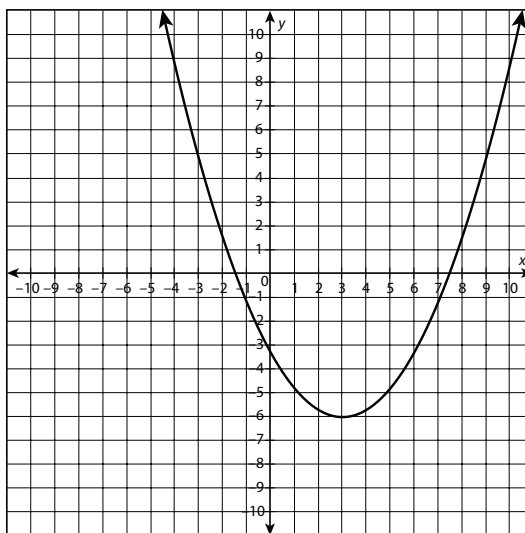


Comparing and Contrasting Functions

Unit Assessment

Circle the letter of the best answer.

1. For the following graph, identify the left and right end behaviors.



- a. left: approaching ∞
right: approaching $-\infty$
- b. left: approaching ∞
right: approaching ∞
- c. left: approaching $-\infty$
right: approaching $-\infty$
- d. left: approaching $-\infty$
right: approaching ∞
2. Darla has \$300 in her savings account, which earns 2% each month. The total balance of Darla's account after x months is represented by the function $m(x) = 300(1.02)^x$. Identify the type of function and the left and right end behaviors on the restricted domain $x \geq 0$.
- a. linear
left end behavior: approaching $-\infty$
right end behavior: approaching ∞
- b. exponential
left end behavior: approaching 0
right end behavior: approaching $-\infty$
- c. quadratic
left end behavior: equals 300 (not increasing or decreasing)
right end behavior: approaching ∞
- d. exponential
left end behavior: equals 300 (not increasing or decreasing)
right end behavior: approaching ∞

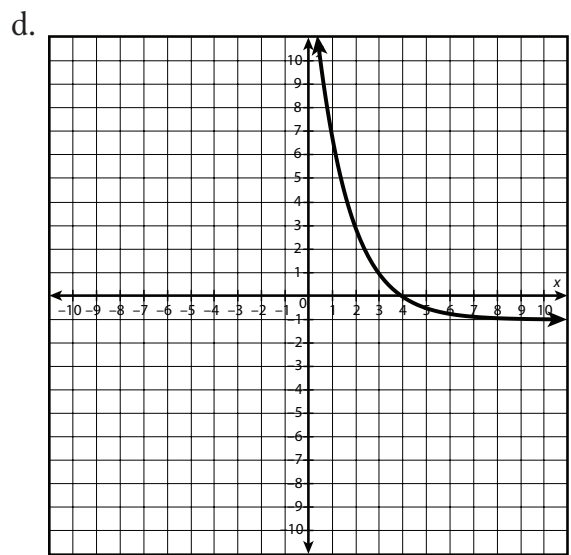
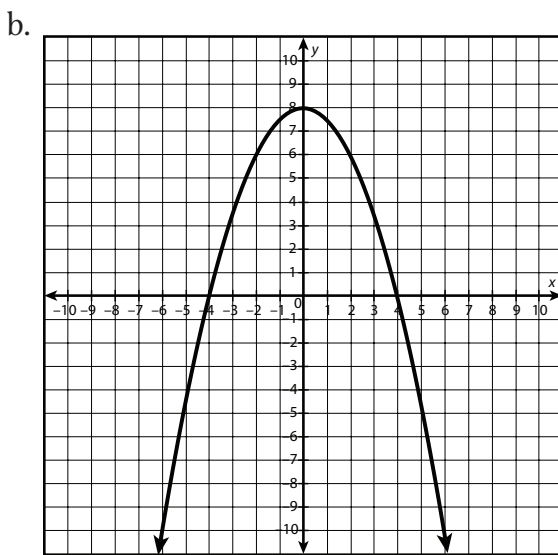
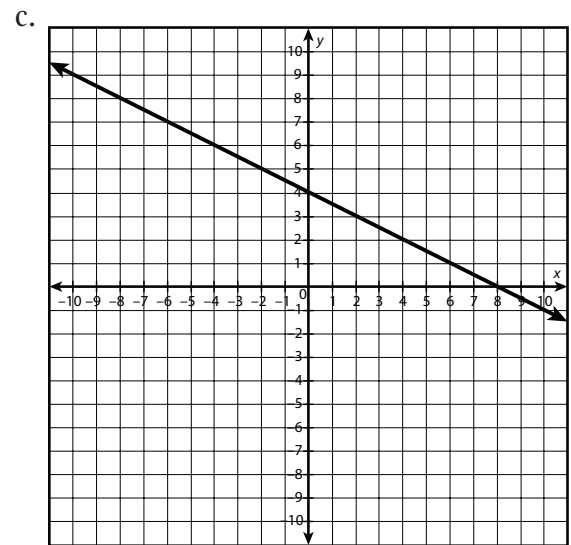
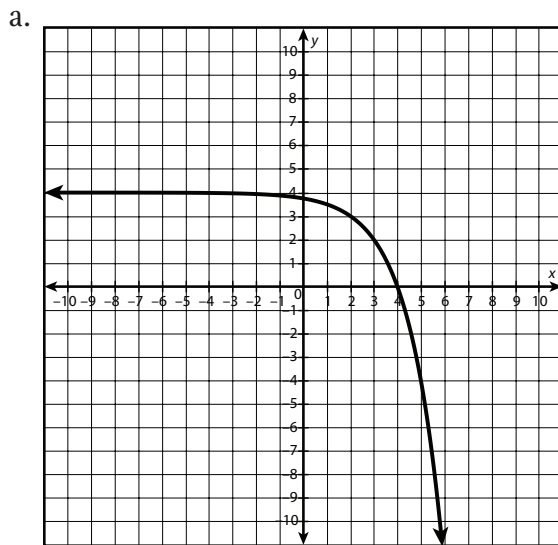
continued

Name: _____

Date: _____

Assessment

3. Which of the following graphs represents a function that is decreasing, is negative when $x > 4$, and has a left end behavior that approaches infinity?

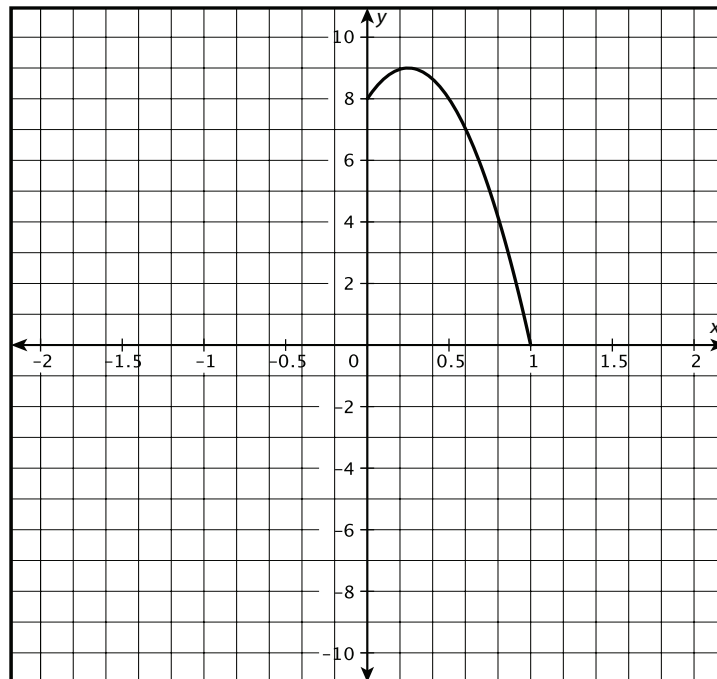


continued

4. In the following table, what is the pattern between dependent values?

Tickets sold	Profit
10	\$80
20	\$160
30	\$240
40	\$320
50	\$400
60	\$480

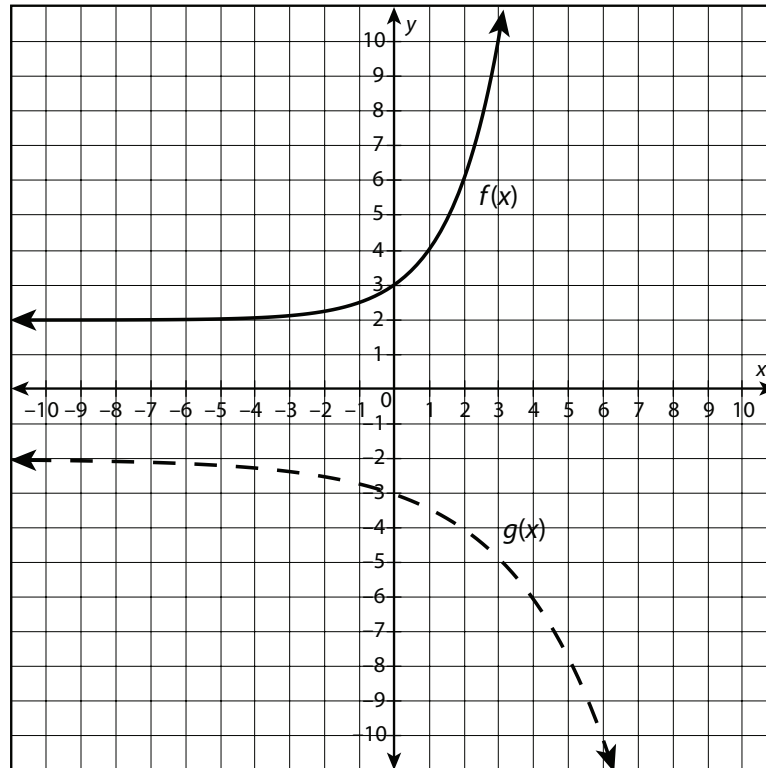
- a. constant first difference
b. constant second difference
c. constant multiple
d. There is no pattern in the values.
5. The following graph represents the height of an object that is launched upwards into the air from a height of 8 feet. What is the approximate rate of change on the interval $[0.2, 1]$?



- a. -9
b. -11.25
c. -0.8
d. -7.5

continued

6. Let $f(x) = 5x^2 + 4$ and $g(x) = 2 \cdot 3^x$. Which of the following statements is true?
- $f(x)$ increases faster than $g(x)$ on the interval $[0, 5]$.
 - $g(x)$ increases faster than $f(x)$ on the interval $[0, 5]$.
 - $f(x)$ and $g(x)$ have the same rate of change on the interval $[0, 5]$.
 - $f(x)$ will always be greater than $g(x)$.
7. Which function is a translation 6 units left of $f(x) = 2x - 5$?
- $g(x) = 2x - 17$
 - $g(x) = 2x + 7$
 - $g(x) = 2x - 12$
 - $g(x) = 2x + 1$
8. Let $f(x) = 2^x + 2$. Which of the following could be $g(x)$?

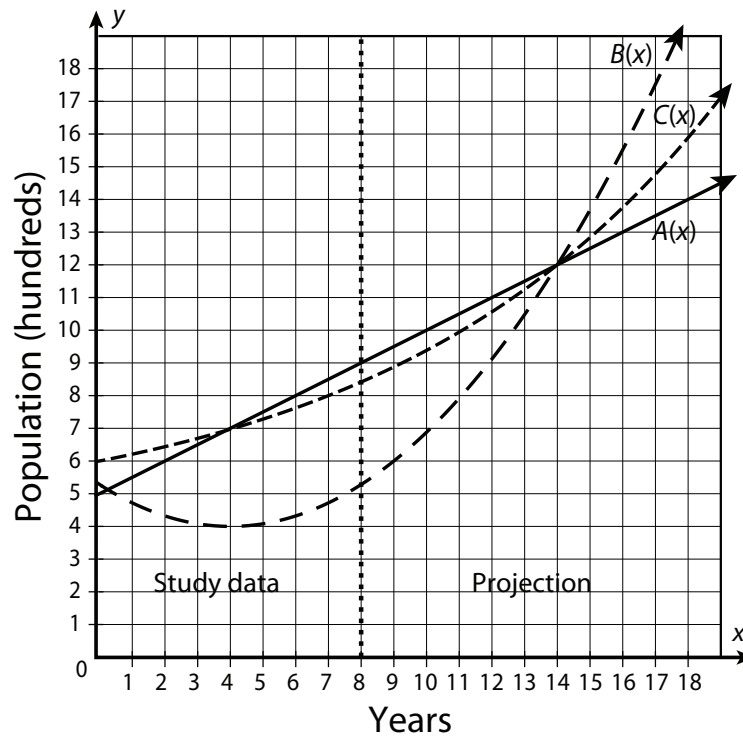


- $g(x) = 2^x - 2$
- $g(x) = 2 \cdot 2^x + 2$
- $g(x) = -2^x - 2$
- $g(x) = -2^{\frac{x}{2}} - 2$

continued

For problems 13–15, read each scenario and answer the questions that follow.

13. Researchers participating in an 8-year study of voles in three different areas derived different population functions for their respective locations. Researcher A found a linear population trend, researcher B found a quadratic population trend, and researcher C found an exponential population trend. The following graph shows the function curves, including both the actual study data and a 10-year projection.



- Identify the domain of the functions.
- Describe the end behavior of $A(x)$.
- Describe the end behavior of $B(x)$.
- Describe the end behavior of $C(x)$.
- If these trends continue, which population will eventually be the greatest? How do you know?

continued

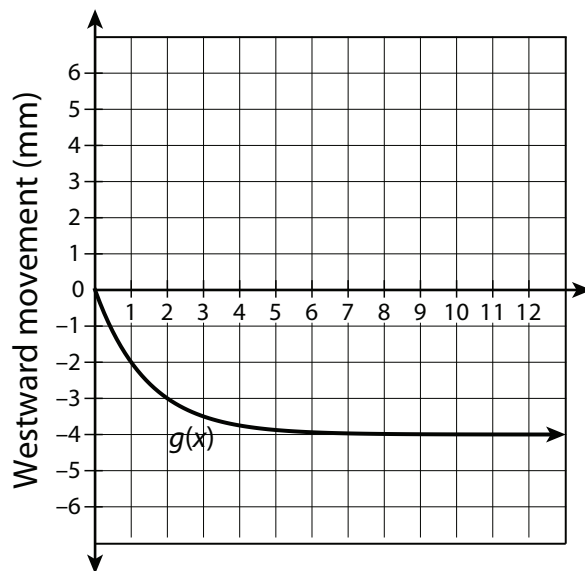
Name:

Date:

Assessment

15. Charlie and Vivian are studying plate boundaries and seafloor spread. They placed super-accurate GPS devices on the ocean floor in order to record how those points have moved. The following table shows the seafloor's northward movement. The graph shows the seafloor's westward movement.

Months (x)	Northward movement, in mm ($f(x)$)
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10



- What is the rate of change for $f(x)$ between $x = 0$ and $x = 2$?
- What is the rate of change for $g(x)$ between $x = 0$ and $x = 2$?
- In which direction has the marker moved farthest after 6 months?
- If this trend continues, will the seafloor be moving faster in the westward direction or the northward direction?