

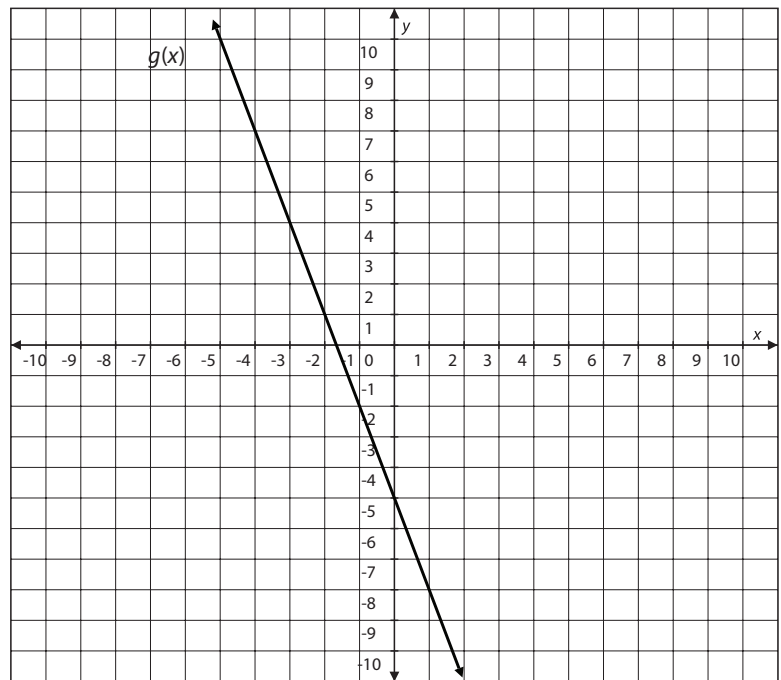
Comparing Functions

Progress Assessment

Circle the letter of the best answer.

1. Which of the following statements is true about the functions $f(x)$ and $g(x)$?

x	$f(x)$
-2	10
0	2
2	-6
4	-14



- The function $f(x)$ has a greater rate of change than the function $g(x)$.
- The function $g(x)$ has a greater rate of change than the function $f(x)$.
- The rates of change for both $f(x)$ and $g(x)$ are equal.
- The rates of change cannot be determined.

continued

2. Which of the following statements is true about the functions $f(x)$ and $g(x)$?

$$f(x) = \frac{1}{4}x + 8$$

x	$g(x)$
-6	4
-3	6
3	10
6	12

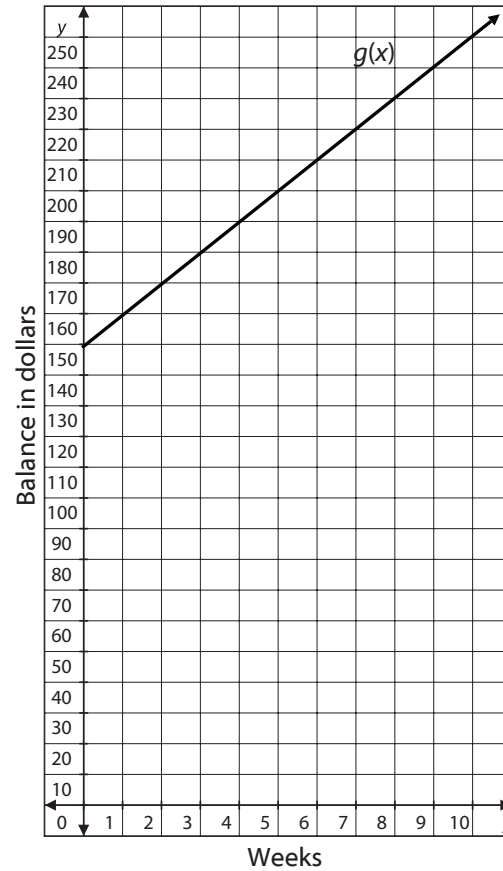
- The y -intercept of the function $f(x)$ is less than the y -intercept of the function $g(x)$.
 - The y -intercept of the function $f(x)$ is greater than the y -intercept of the function $g(x)$.
 - The y -intercept of the function $f(x)$ is equal to the y -intercept of the function $g(x)$.
 - The y -intercepts cannot be determined.
3. The function $f(x)$ represents the total bill from a rental store that charges \$10 to rent a power tool plus an additional \$2 an hour. A second rental store uses the function $g(x) = 15 + 1.5x$ to represent the total bill for a similar power tool.

Which of the following statements is true about the functions $f(x)$ and $g(x)$?

- The function $f(x)$ has a greater rate of change than the function $g(x)$.
- The function $g(x)$ has a greater rate of change than the function $f(x)$.
- The rates of change for both $f(x)$ and $g(x)$ are equal.
- The rates of change cannot be determined.

continued

4. The function $f(x)$ represents the balance of a savings account with an initial deposit of \$500 and weekly deposits of \$25. A different savings account follows the function $g(x)$. The graph of function $g(x)$ is shown.



Which of the following statements is true about the functions $f(x)$ and $g(x)$?

- The y -intercept of the function $f(x)$ is less than the y -intercept of the function $g(x)$.
- The y -intercept of the function $f(x)$ is greater than the y -intercept of the function $g(x)$.
- The y -intercept of the function $f(x)$ is equal to the y -intercept of the function $g(x)$.
- The y -intercepts cannot be determined.

continued

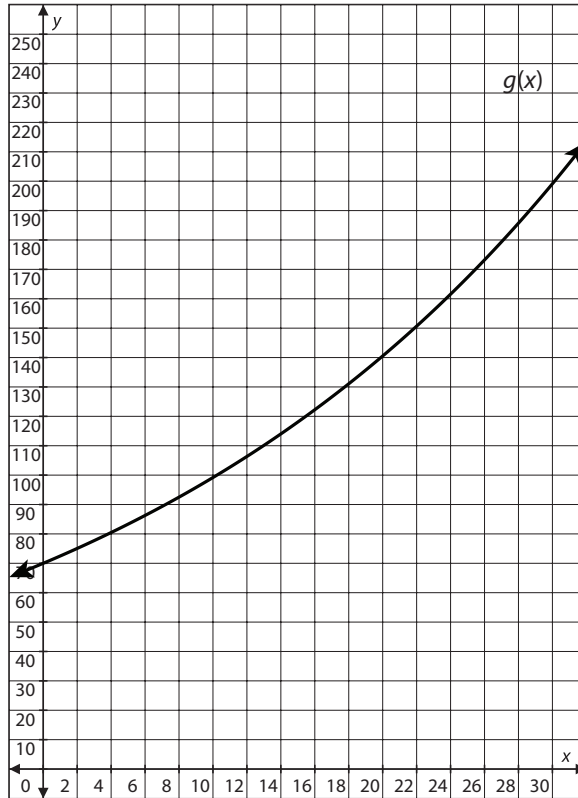
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Assessment

5. Which of the following statements is true about the functions $f(x)$ and $g(x)$ over the interval $0 \leq x \leq 4$?

$$f(x) = 50 \left(1 + \frac{0.35}{4} \right)^{4x}$$

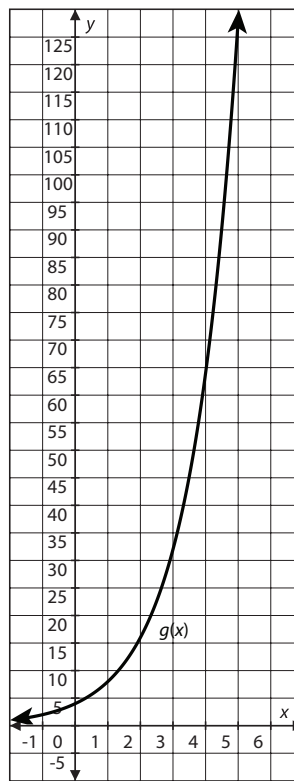


- a. The function $f(x)$ has a greater rate of change than the function $g(x)$ over the interval $0 \leq x \leq 4$.
- b. The function $g(x)$ has a greater rate of change than the function $f(x)$ over the interval $0 \leq x \leq 4$.
- c. The rates of change for both $f(x)$ and $g(x)$ are equal over the interval $0 \leq x \leq 4$.
- d. The rates of change cannot be determined.

continued

6. Which of the following statements is true about the functions $f(x)$ and $g(x)$?

x	$f(x)$
-1	1.5
0	3
1	6
2	12



- The y -intercept of the function $f(x)$ is less than the y -intercept of the function $g(x)$.
- The y -intercept of the function $f(x)$ is greater than the y -intercept of the function $g(x)$.
- The y -intercept of the function $f(x)$ is equal to the y -intercept of the function $g(x)$.
- The y -intercepts cannot be determined.

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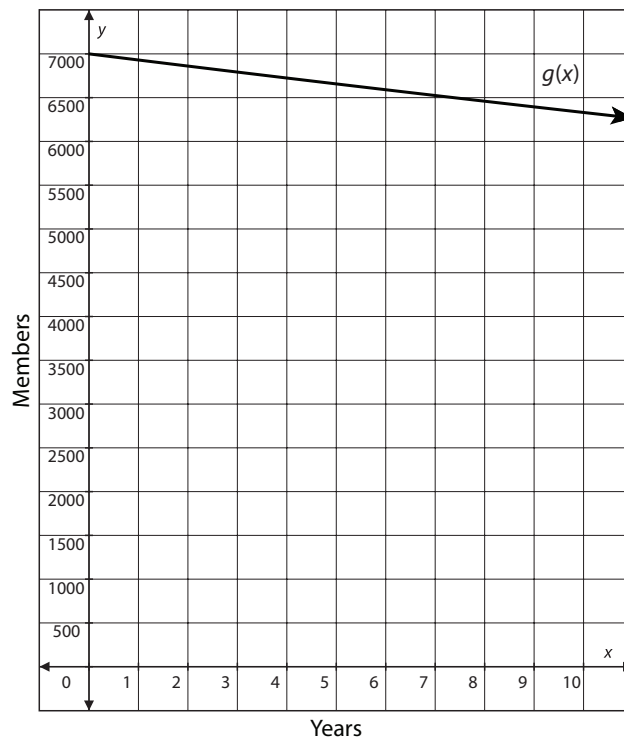
7. The function $f(x)$ represents the amount of air remaining in an exercise ball that originally had 4,500 cubic inches of air and is losing 6% of its air every minute, x . The function $g(x) = 4500(1 - 0.03)^x$ represents the amount of air remaining in a second exercise ball after x minutes.

Which of the following statements is true about the functions $f(x)$ and $g(x)$?

- The function $f(x)$ has a greater rate of change than the function $g(x)$ over the interval $2 \leq x \leq 5$.
 - The function $g(x)$ has a greater rate of change than the function $f(x)$ over the interval $2 \leq x \leq 5$.
 - The rates of change for both $f(x)$ and $g(x)$ are equal over the interval $2 \leq x \leq 5$.
 - The rates of change cannot be determined.
8. The memberships of two music clubs have decreased each year since 2006. The following table shows the membership of the first music club, $f(x)$. The graph represents the membership of the second music club, $g(x)$.

Which of the following statements is true about the functions $f(x)$ and $g(x)$?

x	$f(x)$
0	12,000
2	11,290
4	10,624
6	9996



- The y -intercept of the function $f(x)$ is less than the y -intercept of the function $g(x)$.
- The y -intercept of the function $f(x)$ is greater than the y -intercept of the function $g(x)$.
- The y -intercept of the function $f(x)$ is equal to the y -intercept of the function $g(x)$.
- The y -intercepts cannot be determined.

continued

9. Which of the following statements is true about the functions $f(x) = 5(2)^x$ and $g(x) = 5 + 2x$?
- The rate of change of the function $f(x)$ is always greater than the rate of change of the function $g(x)$.
 - The rate of change of the function $f(x)$ will eventually be greater than the rate of change of the function $g(x)$.
 - The rate of change of the function $f(x)$ is never greater than the rate of change of the function $g(x)$.
 - The rate of change of an exponential function cannot be determined.
10. Which of the following statements is true about the functions $f(x) = 0.4x + 2$ and $g(x) = 10(1.05)^x$?
- The rate of change of the function $f(x)$ is always greater than the rate of change of the function $g(x)$.
 - The rate of change of the function $g(x)$ will eventually be greater than the rate of change of the function $f(x)$.
 - The rate of change of the function $f(x)$ is never greater than the rate of change of the function $g(x)$.
 - The rate of change of an exponential function cannot be determined.

Use what you know about linear and exponential functions to solve all the parts of the problem that follows.

11. You are looking to invest \$700. One savings option follows the function $f(x) = 700 + 49x$, where $f(x)$ is the amount of money in savings after x years. The second option is represented by the function $g(x) = 700\left(1 + \frac{0.05}{12}\right)^{12x}$, where $g(x)$ is the amount of money after x years.
- Which increases faster, $f(x)$ or $g(x)$? Use a graph to explain your answer.
 - At what point does the value of $g(x)$ exceed the value of $f(x)$?
 - If you were looking to invest your money for less than 10 years, which option would you choose? Explain your reasoning.
 - If you were looking to invest your money for more than 25 years, which option would you choose? Explain your reasoning.