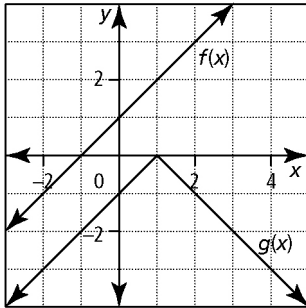


Chapter 10 Test

Multiple Choice

For #1 to #5, select the best answer.

1. From the graph, what is the value of $(f - g)(2)$?



- A -3 B 0
C 2 D 4

2. Given $f(x) = x^2 + 2$ and $g(x) = x - 5$, which equation represents $h(x) = (f + g)(x)$?

- A $h(x) = 2x^2 - 5$
B $h(x) = x^2 + x - 3$
C $h(x) = x^2 + x - 5$
D $h(x) = x^2 + 2x - 5$

3. Let $f(x) = x - 1$ and $g(x) = x^2 - 1$. Determine the non-permissible values of $y = \left(\frac{f}{g}\right)(x)$.

- A 1 B -1
C ± 1 D none

4. If $f(x) = \sqrt{3x - 1}$ and $g(x) = x^2$, which is the domain of $m(x) = \frac{f(x)}{g(x)}$?

- A $\{x \mid x > 0, x \in \mathbb{R}\}$
B $\{x \mid x \neq 0, x \in \mathbb{R}\}$
C $\left\{x \mid x > \frac{1}{3}, x \in \mathbb{R}\right\}$
D $\left\{x \mid x \neq \frac{1}{3}, x \in \mathbb{R}\right\}$

5. Consider the functions $f(x) = x^2 + 2$ and $g(x) = -|x + 1|$. Which statement is true?

- A $\frac{f(x)}{g(x)} > 0, x \neq -1$ B $f(x) - g(x) < 0$
C $f(x) > g(x)$ D $(g \circ f)(x) > 1$

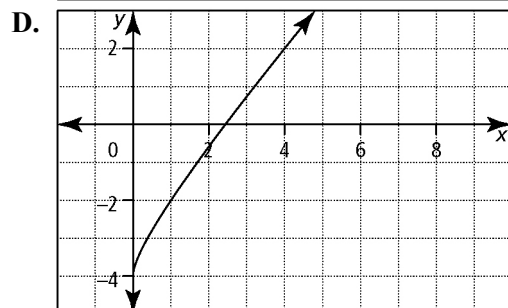
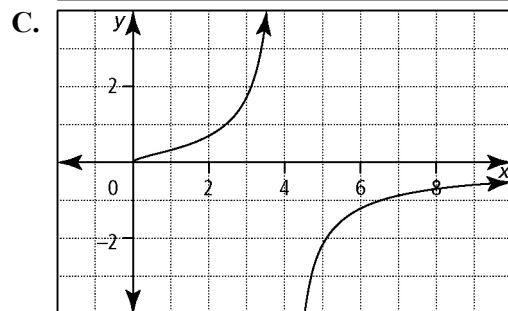
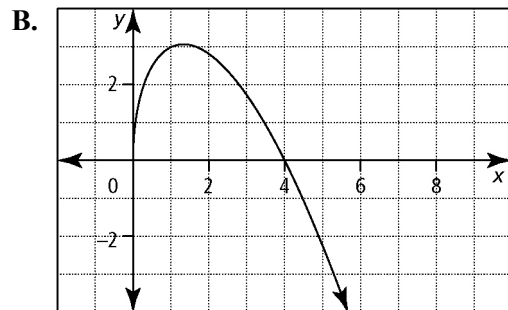
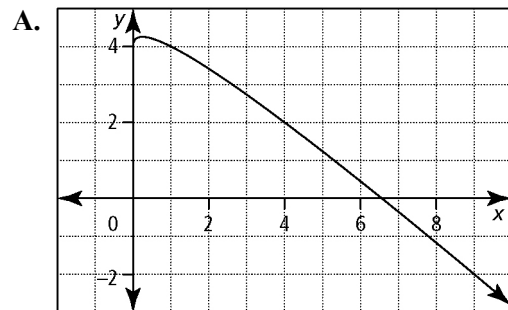
Short Answer

6. Given $f(x) = \sqrt{x}$ and $g(x) = 4 - x$, match the combined function in set A with the graph in set B.

Set A

- i) $(f - g)(x)$ ii) $(f + g)(x)$
iii) $f(x)g(x)$ iv) $\left(\frac{f}{g}\right)(x)$

Set B



7. Use the table to evaluate each expression:

x	$f(x)$	$g(x)$
1	3	6
2	1	3
3	4	2
4	2	1
5	2	2
6	5	3

a) $f(g(1))$

b) $(g \circ f)(3)$

c) $\left(\frac{f}{g}\right)(5)$

d) $(g \circ g)(1)$

8. Given the functions $f(x) = \frac{1}{x}$ and

$$g(x) = \frac{1}{x-1}, \text{ determine the equation of the}$$

combined function $h(x)$. Then state the domain of $h(x)$.

a) $h(x) = (f + g)(x)$

b) $h(x) = (f - g)(x)$

c) $h(x) = f(x)g(x)$

d) $h(x) = \left(\frac{f}{g}\right)(x)$

9. Let $f(x) = x + 1$, $g(x) = x^2 + 1$, and $h(x) = 1 - x$. Determine each equation.

a) $q(x) = f(x) + h(x)$

b) $p(x) = g(f(x))$

10. Find two functions, $f(x)$ and $g(x)$, such that $f(g(x)) = (2x + 3)^2 - 5$.

Extended Response

11. Consider the functions $f(x) = x^2$ and $g(x) = 2^x$.

a) Determine the equation of $h(x) = \frac{f(x)}{g(x)}$,

and state the domain of $h(x)$.

b) How does the graph of $h(x)$ behave for large values of x ?

12. Assume $f(x) = x$ and $g(x) = |x|$.

a) Determine the equation of

$$h(x) = \frac{3f(x) + g(x)}{f(x)}.$$

b) Sketch the graph of $h(x)$.

c) State the domain and range of $h(x)$.

13. If $f(x) = x^2$ and $h(x) = x + 1$, then

$$g(x) = 3(f(h(x))) - 5.$$

a) Determine an equation for $g(x)$.

b) Describe $g(x)$ as a transformation of $f(x)$.

14. Let $h(x) = \cos x$ and $g(x) = \frac{1}{x}$. Determine

the composite functions $h(g(x))$ and $g(h(x))$, and state their domains.

15. Angular speed is the rate at which the central angle is changing. Suppose a bicycle wheel with diameter 700 mm makes 30 revolutions in t seconds.

a) Write an equation for the angular speed, v , as a function of time t .

b) Write an equation for angular speed, v , as a function of time t , if t is increased by 1 s.

c) Combine your functions to write an equation for the change in angular speed when time increases by 1 s.

