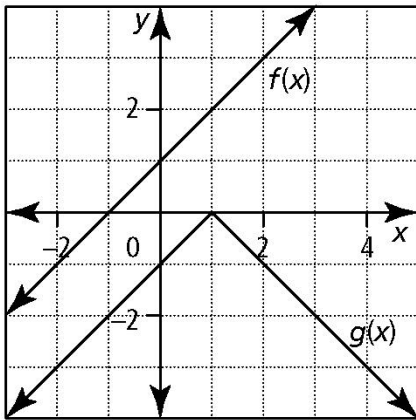


Name: _____

Date: _____

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

1. _____



- (A) -3
 (B) 0
 (C) 2
 (D) 4

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

- (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. Given the functions $f(x) = 4x - 6$ and $g(x) = (x - 2)^2$, determine $h(x) = f(x) - g(x)$. 3. _____

- (A) $h(x) = -x^2 + 4x - 2$
 (B) $h(x) = -x^2 - 10$
 (C) $h(x) = -x^2 + 4x - 10$
 (D) $h(x) = -x^2 + 8x - 10$

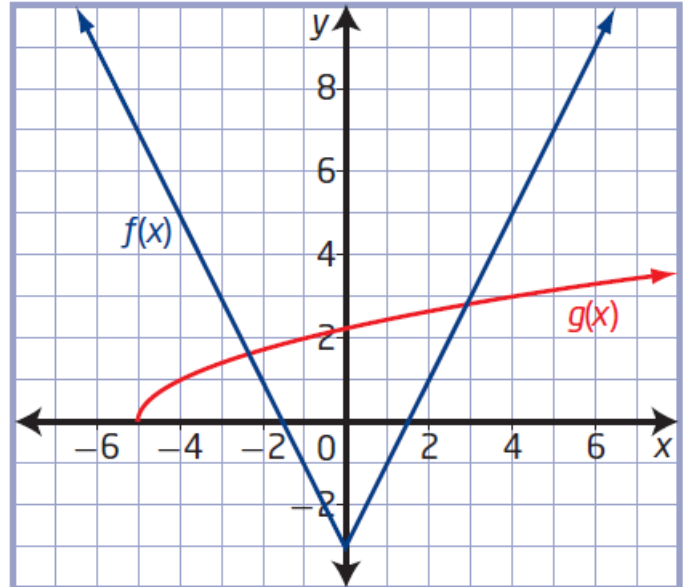
4. Use the graphs of $f(x)$ and $g(x)$ to evaluate the following:

(a) $(f + g)(4)$

(b) $(f + g)(-4)$

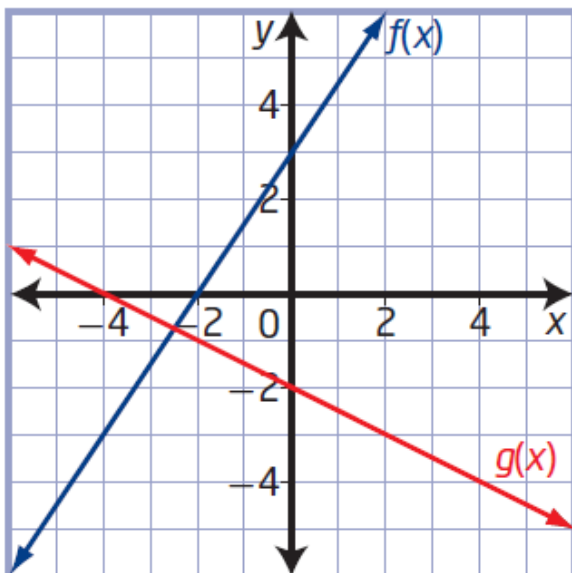
(c) $(f + g)(-5)$

(d) $(f + g)(-6)$

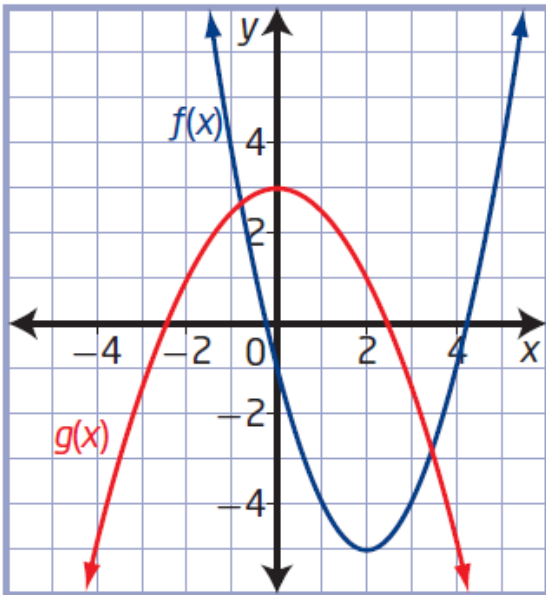


5. If $h(x) = (f - g)(x)$ and $f(x) = 5x + 2$ determine $g(x)$ if $h(x) = -x^2 + 5x + 3$

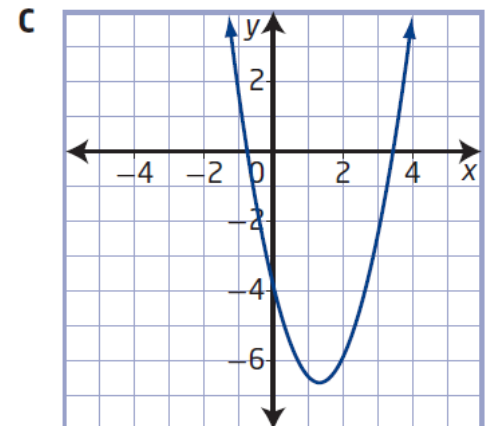
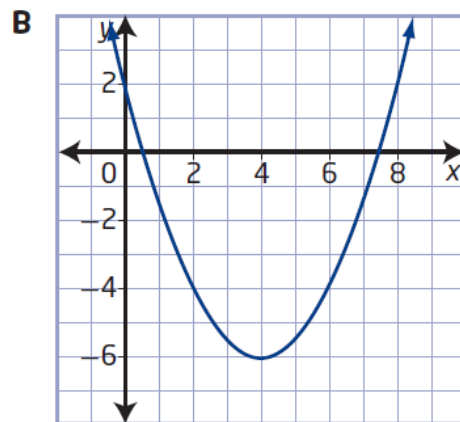
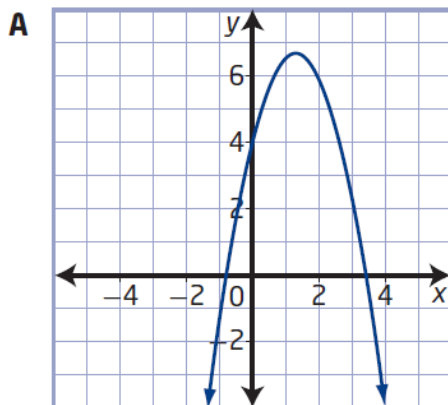
6. The graph of $f(x)$ and $g(x)$ are shown. Add the sketch of the graph of the combined function $h(x) = (f + g)(x)$ to the same set of axes.



7. Use the graphs of $f(x)$ and $g(x)$ to determine which graph matches each combined function.



- (a) $y = (f + g)(x)$
- (b) $y = (f - g)(x)$
- (c) $y = (g - f)(x)$



8. Let $f(x) = x - 1$ and $g(x) = x^2 - 1$. Determine the non-permissible values 8. _____

of $y = \left(\frac{f}{g}\right)(x)$.

- (A) 1
- (B) -1
- (C) ± 1
- (D) none

9. If $f(x) = \sqrt{3x-1}$ and $g(x) = x^2$, which is the domain of $m(x) = \frac{f(x)}{g(x)}$? 9. _____

- (A) $\{x \mid x > 0, x \in \mathbf{R}\}$
- (B) $\{x \mid x \neq 0, x \in \mathbf{R}\}$
- (C) $\left\{x \mid x \geq \frac{1}{3}, x \in \mathfrak{R}\right\}$
- (D) $\left\{x \mid x \neq \frac{1}{3}, x \in \mathbf{R}\right\}$

10. Given $f(x) = x + 1$, $g(x) = x - 5$, and $h(x) = x - 4$, determine each combined function.

(i) $y = f(x)g(x)h(x)$

(ii) $y = \frac{f(x)g(x)}{h(x)}$

11. Consider the functions $f(x) = x^2 + 6x + 8$ and $g(x) = x + 4$.

- (i) Algebraically determine an equation for $h(x) = \left(\frac{f}{g}\right)(x)$.
- (ii) State the domain of $h(x)$.

12. Given $f(x) = x + 2$ and $g(x) = x^2 + 3x - 1$, determine the value of $f(g(3))$.

12. ___

- (A) 16
(B) 17
(C) 19
(D) 39

13. Given $f(-1) = 7$, $f(7) = 5$, $f(3) = 0$, $g(-1) = 3$, $g(7) = -1$, and $g(5) = -2$, find each value.

a) $f(g(7))$

b) $f(g(-1))$

c) $g(f(-1))$

14. Given $f(x) = x^2 - 1$ and $h(x) = \sqrt{x-3}$, $p(x) = \frac{1}{x+1}$, determine each composition and state its domain.

a) $(f \circ h)(x)$ Domain: _____

b) $(p \circ f)(x)$ Domain: _____

(c) $p(h(x))$ Domain: _____

15. Determine the functions, $f(x)$ and $g(x)$, such that $f(g(x)) = (2x + 3)^2 - 5$.

$f(x) =$ $g(x) =$

16. Given $f(x) = \frac{1}{\sqrt{(x-1)^2 + 4}}$ Determine the functions $a(x)$, $b(x)$, and $c(x)$ such that

$$f(x) = a(b(c(x)))$$

$a(x) =$

$b(x) =$

$c(x) =$

