

## Function Operations

Examples: Add, subtract, or multiply the following functions.

1. Given  $f(x) = 3x + 4$  and  $g(x) = x^2 - 5x + 2$ , find  $f + g$  and  $f - g$ .

2. Given  $f(x) = 3x + 4$  and  $g(x) = x^2 - 5x + 2$ , find  $f \cdot g$ .

3. Given  $f(x) = 2x^2 + 7x - 1$  and  $g(x) = 3 - 2x$ , find  $f + g$  and  $f - g$ .

4. Given  $f(x) = 2x^2 + 7x - 1$  and  $g(x) = 3 - 2x$ , find  $f \cdot g$ .

Examples: Divide the following functions.

5. Given  $f(x) = x - 7$  and  $g(x) = 2x^2 - 13x - 7$ , find  $\frac{f}{g}$ .

6. Given  $f(x) = x - 3$  and  $g(x) = x^2 - x - 6$ , find  $\frac{f}{g}$ .

7. Given  $f(x) = x^2 - 3x - 18$  and  $g(x) = x + 3$ , find  $\frac{f}{g}$  and its domain.

**Examples: Find the following compositions of functions.**

8. Given  $f(x) = x^2$  and  $g(x) = x + 1$ , find  $f(g(3))$  and  $f(g(x))$ .

9. Given  $f(x) = 2x - 1$  and  $g(x) = 3x$ , find  $f(g(2))$  and  $f(g(x))$ .

10. Given  $f(x) = \sqrt{x + 7}$  and  $g(x) = 2x - 5$ , find  $(f \circ g)(x)$ .

11. Given  $f(x) = x^2 + x + 2$  and  $g(x) = 4 - x$ , find  $(f \circ g)(x)$ .

12. Given  $f(x) = x^2 + 1$  and  $g(x) = x - 5$ , find  $(f \circ g)(x)$ .