

Exercise 36

For the following exercises, for each pair of functions, find a. $f + g$ b. $f - g$ c. $f \cdot g$ d. f/g . Determine the domain of each of these new functions.

$$f(x) = 3x + 4, g(x) = x - 2$$

Solution

$$f + g = f(x) + g(x) = (3x + 4) + (x - 2) = 4x + 2 \quad \text{Domain: } \{x \mid -\infty < x < \infty\}$$

$$f - g = f(x) - g(x) = (3x + 4) - (x - 2) = 2x + 6 \quad \text{Domain: } \{x \mid -\infty < x < \infty\}$$

$$f \cdot g = f(x)g(x) = (3x + 4)(x - 2) = 3x^2 - 2x - 8 \quad \text{Domain: } \{x \mid -\infty < x < \infty\}$$

$$f/g = \frac{f(x)}{g(x)} = \frac{3x + 4}{x - 2} \quad \text{Domain: } \{x \mid x \neq 2\}$$