

Exercise 40

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.

$$f(x) = \sqrt{x}, g(x) = x - 2$$

Solution

$$f + g = f(x) + g(x) = (\sqrt{x}) + (x - 2) = \sqrt{x} + x - 2 \quad \text{Domain: } \{x \mid x \geq 0\}$$

$$f - g = f(x) - g(x) = (\sqrt{x}) - (x - 2) = \sqrt{x} - x + 2 \quad \text{Domain: } \{x \mid x \geq 0\}$$

$$f \cdot g = f(x)g(x) = (\sqrt{x})(x - 2) = x^{3/2} - 2x^{1/2} \quad \text{Domain: } \{x \mid x \geq 0\}$$

$$f/g = \frac{f(x)}{g(x)} = \frac{\sqrt{x}}{x - 2} \quad \text{Domain: } \{x \mid x \geq 0, x \neq 2\}$$