

Guiding Question: Can I add, subtract, and multiply functions?

p. 20-21

Function Operations

6.6

Warm-up: Simplify the following completely, if possible

p. 20

1)

$$\sqrt{x} + \sqrt{x}$$

$$2\sqrt{x}$$

2)

$$x + \sqrt{x}$$

$$x + \sqrt{x}$$

3)

$$\sqrt{x} \cdot \sqrt{x}$$

$$\sqrt{x \cdot x}$$

$$\textcircled{xx}$$

$$x$$

Mathematical Operations

p. 21

The function operations we will focus on in this section are Addition, Subtraction and Multiplication

| Operation | Function Notation |
|-----------------------|--|
| Addition | $(f + g)(x)$ means $f(x) + g(x)$ |
| Subtraction | $(f - g)(x)$ means $f(x) - g(x)$ |
| Multiplication | $(f \cdot g)(x)$ means $f(x) \cdot g(x)$ |

$$f(x)$$

Practice: perform the indicated operations using the given functions.

$$f(x) = \sqrt{x} + 9$$

$$\text{and } g(x) = \sqrt{x} + 2$$

1. $(f + g)(x)$

$$\begin{aligned} & \overbrace{(\sqrt{x} + 9)} + \overbrace{(\sqrt{x} + 2)} \\ & \underline{\sqrt{x} + 9} + \underline{\sqrt{x} + 2} \\ & 2\sqrt{x} + 11 \end{aligned}$$

2. $(f - g)(x)$

$$\begin{aligned} & f(x) - g(x) \\ & \underline{\sqrt{x} + 9} - (\underline{\sqrt{x} + 2}) \\ & \underline{\sqrt{x} + 9} - \underline{\sqrt{x} + 2} \\ & 7 \end{aligned}$$

Practice: perform the indicated operations using the given functions.

$$f(x) = (\sqrt{x} + 9)$$

$$\text{and } g(x) = (\sqrt{x} + 2)$$

3. $(f \cdot g)(x)$

$$\begin{aligned} & f(x) \cdot g(x) \\ & (\sqrt{x} + 9) \cdot (\sqrt{x} + 2) \\ & \sqrt{x} \cdot \sqrt{x} + 2\sqrt{x} + 9\sqrt{x} + 18 \\ & x + 11\sqrt{x} + 18 \end{aligned}$$

You try: perform the indicated operations using the given functions.

$$f(x) = \sqrt{x} + 4 \quad \text{and} \quad g(x) = \sqrt{x} + 5$$

4. $(f + g)(x)$

$$\begin{aligned} &\sqrt{x} + 4 + \sqrt{x} + 5 \\ &2\sqrt{x} + 9 \end{aligned}$$

5. $(f - g)(x)$

$$\begin{aligned} &\sqrt{x} + 4 - (\sqrt{x} + 5) \\ &\sqrt{x} + 4 - \sqrt{x} - 5 \\ &-1 \end{aligned}$$

You try: perform the indicated operations using the given functions.

$$f(x) = \sqrt{x} + 4 \quad \text{and} \quad g(x) = \sqrt{x} + 5$$

6. $(f \cdot g)(x)$

$$\begin{aligned} &(\sqrt{x} + 4)(\sqrt{x} + 5) \\ &x + 5\sqrt{x} + 4\sqrt{x} + 20 \\ &x + 9\sqrt{x} + 20 \end{aligned}$$

$$\begin{aligned} &\sqrt{x} \cdot \sqrt{x} \\ &\sqrt{x \cdot x} \\ &x \end{aligned}$$

Guiding Question:

Can I add, subtract, and multiply functions?

Homework - Worksheet

Test is on Thursday!