

Guiding Question:

Can I add, subtract, and multiply functions?

p. 20-21

Function Operations

6.6

p. 20

Warm-up: Simplify the following completely, if possible

1)

$$1\sqrt{x} + 1\sqrt{x}$$

$$2\sqrt{x}$$

2)

$$x + \sqrt{x}$$

3)

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

$$x$$

p .21

## Mathematical Operations

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

Operation	Function Notation	
<b>Addition</b>	$(f + g)(x)$	means $f(x) + g(x)$
<b>Subtraction</b>	$(f - g)(x)$	means $f(x) - g(x)$
<b>Multiplication</b>	$(f \cdot g)(x)$	means $f(x) \cdot g(x)$

Practice: perform the indicated operations using the given functions.

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

and

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

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

$$\begin{array}{l} f(x) + g(x) \\ (\sqrt{x} + 9) + (\sqrt{x} + 2) \end{array}$$

$$\underline{1}\sqrt{x} + 9 + \underline{1}\sqrt{x} + 2$$

$$\boxed{2\sqrt{x} + 11}$$

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

$$\begin{array}{l} f(x) - g(x) \\ (\sqrt{x} + 9) - (\sqrt{x} + 2) \end{array}$$

$$\cancel{\sqrt{x}} + 9 - \cancel{\sqrt{x}} - 2$$

$$\boxed{7}$$

Practice: perform the indicated operations using the given functions.

$$f(x) = \sqrt{x} + 9 \quad \text{and} \quad g(x) = \sqrt{x} + 2$$

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

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

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.  $(f + g)(x)$

$$(\sqrt{x} + 4) + (\sqrt{x} + 5)$$

$$2\sqrt{x} + 9$$

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

$$(\sqrt{x} + 4) - (\sqrt{x} + 5)$$

$$\sqrt{x} + 4 - \sqrt{x} - 5$$

$$-1$$

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

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

$$(\sqrt{x} + 4) \cdot (\sqrt{x} + 5)$$

$$\boxed{\sqrt{x} \cdot \sqrt{x}} + \underline{5\sqrt{x}} + \underline{4\sqrt{x}} + 20$$

↓

$$x + 9\sqrt{x} + 20$$

*Guiding Question:*

*Can I add, subtract, and multiply functions?*

Homework - Worksheet

Test is on Thursday!

