

Answer **Example 5 Try It!** Page 127 Student Companion. Answer only 5a.

$$\text{a. } \sqrt{x+4} - \sqrt{3x} = -2$$

$$\sqrt{x+4} = \sqrt{3x} - 2$$

$$(\sqrt{x+4})^2 = (\sqrt{3x} - 2)^2$$

$$x+4 = 3x+4-4\sqrt{3x}$$

$$-2x = -4\sqrt{3x}$$

$$(-2x)^2 = (-4\sqrt{3x})^2 = 16 \cdot 3x$$

$$4x^2 = 48x \rightarrow 4x(x-12) = 0$$

$$\begin{array}{|c|c|c|} \hline \sqrt{3x} & -2 & \\ \hline 3x & -2\sqrt{3x} & \\ \hline -2 & -2\sqrt{3x} & +4 \\ \hline \end{array}$$

$$x = \cancel{0}, 12$$

$$x = 12$$

Solve.

$$\sqrt{2x+70} + 5 = x$$

$$\sqrt{2x+70} = x-5$$

$$(\sqrt{2x+70})^2 = (x-5)^2$$

$$2x+70 = x^2-10x+25$$

$$0 = x^2-12x-45$$

$$\begin{array}{c} -45 \\ -15 \quad +3 \\ -12 \end{array}$$

$$0 = (x-15)(x+3)$$

$$x = 15, \cancel{-3}$$

$$x = 15$$

Answer **Habits of mind** middle of page 127 in Student Companion.

Why are extraneous solutions a possibility for radical equations?

Some radicals have restrictions on what the radicand can be and what can come out of them (i.e. square roots).

When you solve these equations, one step is eliminating the radical.

When you do this you lose the restriction that is on the original equation.

And when you solve this resulting equation you must be sure you don't list answers that don't make the original equation true.

Do you think that there could be extraneous solutions for this equation?

$$\sqrt[3]{x^2-7} = \sqrt[3]{x-1}$$

No.

Since there are no restrictions on what you can cube root or what comes out of a cube root (domain and range are all real numbers) there won't be any extraneous solutions.

Hwk #5 Sec 5-4

Page 269

Due Monday

Problems 12, 23, 24, 29, 30, 34, 38

Sec 5-5: Function Operations

- Function Addition
- Function Subtraction
- Function Multiplication
- Function Division
- Composite Functions

EXAMPLE 1 Try It! Add and Subtract Functions top of page 132

1. Let $f(x) = 2x^2 + 7x - 1$ and $g(x) = 3 - 2x$. Identify rules for the following functions.

a. $f + g$

$$2x^2 + 7x - 1 + 3 - 2x$$

$$= 2x^2 + 5x + 2$$

b. $f - g$

$$2x^2 + 7x - 1 - (3 - 2x)$$

$$= 2x^2 + 9x - 4$$

EXAMPLE 2 Try It! Multiply Functions

page 132

2. Suppose demand, d , for a company's product at cost, x , is predicted by the function $d(x) = -0.25x^2 + 1,000$, and the price, p , that the company can charge for the product is given by $p(x) = x + 16$. Find the company's revenue function.

Revenue = (demand) \times (price)

$$= (-0.25x^2 + 1000)(x + 16)$$

	$-0.25x^2$	$+1000$
\times	$-0.25x^3$	$+1000x$
$+16$	$-4x^2$	$+16000$

$$= -0.25x^3 - 4x^2 + 1000x + 16000$$