Solving an Equation With Two Radicals

EX #6: What is the solution of the following?

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

SOLVING SQUARE ROOT AND OTHER RADICAL EQUATIONS

VOCABULARY

Radical equation – an equation that has a variable in a radicand or has a variable with a rational exponent.

EX. $\sqrt{x^3} + 1 = 65$

Square root equation – a radical equation in which the radical has index 2

EX. $\sqrt{x} = 9$

To Solve Radical Equations:

1. Isolate the radical on one side of the equation

2. Raise each side of the equation to the power of the index.

3. Solve for the variable.

4. For equations of the form: $x^{\frac{m}{n}} = k$

   Raise each side of the equation to the power n/m.

   NOTE: If either m or n is even, then
   $$\left(x^{m/n}\right)^{n/m} = |x|$$

Solving a Square Root Equation

EX #1: Solve.

$$\sqrt{4x + 1} - 5 = 0$$

EX #2: Solve.

$$\sqrt{2x - 5} + 4 = 7$$

Checking for Extraneous Solutions

EX. #5: Find the solution and check you results.

A. $\sqrt{5x - 1} + 3 = x$

B. When should you check for extraneous solutions?

EX #3: Solve.

    A. $2(x+3)^{\frac{2}{3}} = 8$

    B. $5(x+1)^{\frac{3}{4}} - 1 = 39$

Using Radical Equations

EX #4: The size of Meteor Crater in Arizona can be modeled by the equation $d = 2\sqrt[3]{\dfrac{V}{0.3}}$, where V is the volume in cubic meters, d is the diameter of the rim, in meters.

A. The crater has a diameter of about 1.2 km. What is the volume of Meteor Crater?

B. Suppose the diameter of a similarly shaped crater is 1 km. What is the volume of the crater?

A Challenging Problem

EX #7: Solve, check your results.

$$\sqrt{3x + 1} - \sqrt{x + 1} = 2$$