Solve Radical Equations

Section 6.6

Algebra 2

Mr. Keltner

Radical Equations

- Equations that have radicals with variables in their radicand(s) are called radical equations.
- A few examples are:

$$\sqrt{x+25} = 4 \qquad 2\sqrt[3]{x-3} = 4$$

$$\sqrt[3]{x} - 9 = -1$$

Steps to Solving Radical Equations

- **Isolate the radical** expression on one side of the equation.
- Raise each side of the equation to a power that matches the (larger) index of the radical expression(s).
- Solve the equation. **CHECK YOUR SOLUTIONS.**

- **Example 1**: Solve

$$\sqrt{5x-9}=11$$

Example 2

- If Kevin is hanging Christmas lights and leans a ladder against the side of the house, the height where it contacts the house is given by

$$h(x) = \sqrt{225 - x^2}$$

- Where x is the distance the ladder is away from the base of the house.
- Find the distance the ladder should be placed from the house in order to reach 12 feet above the ground.

Rational Exponents

- When we encounter equations where the variable has a rational exponent, or fraction, we raise each side of the equation to the ***reciprocal*** of that fraction's exponent.
- **Example 3**: Solve $7x^{3/5} = 56$

Example 4

- Solve $(x-4)^{2/3} - 9 = 16$

Example 5

- This example illustrates the importance of checking your answers.
- Solve $x - 8 = \sqrt{x - 6}$

Example 6

- Sometimes it may be necessary to square an equation more than once in order to eliminate any radicals.
- Solve $\sqrt{x+6} = \sqrt{11-x} - 3$

Assessment

Pgs. 456-457:

#’s 6-18, 26-31, 37-48, skip 43 & 44