

## 4.2: Solving Radical Equations

### Power Theorem

If  $x = y$ , then  $x^n = y^n$ , where  $n$  is a positive integer.

(However, if  $x^n = y^n$ , then  $x = y$  may not be true; solutions that do not satisfy the original equation are called **extraneous solutions**)

### Solving Radical Equations Algebraically:

1. Isolate the radical.
2. Square/cube both sides to remove the radical.
3. Solve.
4. Check with original equation for extraneous solutions.

### Example 1:

a.)  $3\sqrt{x} = 12$

b.)  $\sqrt{5x - 2} - 6 = 0$

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

d.)  $\sqrt{x + 2} - x = 0$

$$e.) \sqrt{3x+7} - x = 1$$

$$f.) \sqrt{x-1} - x + 7 = 0$$

$$g.) \sqrt[3]{x-10} + x = 0$$

**Solving Radical Equations Graphically:**

Either use a table of values to try and predict the x-intercept OR isolate the radical and sketch both sides of the equation to find the intersection point.

**Example 2:**

Solve graphically:

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

