

## 19.6 Solving Radical Equations

### ❖ The Principle of Powers

**Radical Equation:** an equation in which the variable appears in a radicand.

#### The Principle of Powers (Power Rule)

If  $a = b$ , then  $a^n = b^n$  for any exponent  $n$ .

**To solve an equation with a radical term:**

- 1) **Isolate** the radical expression on one side of the equation
- 2) Use the Principle of Powers (Power Rule)
- 3) Solve for the variable
- 4) **Check** answer(s) for extraneous solution

**Ex.** Solve.

(a)  $\sqrt[3]{8m} + 2 = 6$

(b)  $9 + \sqrt[4]{m+3} = 2$

(c)  $6 - \sqrt[4]{y-7} = 3$

(d)  $-9\sqrt[3]{2x+5} = 18$

(e)  $y = \sqrt{4y+1} + 5$

(f)  $3 + x = \sqrt{7+3x}$

❖ Equations with Two Radical Terms

**Ex.** Solve.

(a)  $\sqrt{2t-7} = \sqrt{3t-12}$

(b)  $\sqrt[4]{3x-4} = \sqrt[4]{5x+2}$

(c)  $\sqrt[3]{3h-4} = \sqrt[3]{h+4}$

**Ex.** (#52) After an accident, how do police determine the speed at which the car had been traveling? The formula  $r = 2\sqrt{5L}$  can be used to approximate the speed  $r$ , in miles per hour, of a car that has left a skid mark of length  $L$ , in feet. How far will a car skid at 100 mph?