

## 2.7 Solve Rational Equations in One Variable

### **ESSENTIAL QUESTIONS**

1. How will you solve equations involving rational expressions, both algebraically and graphically?
2. Why is it important to check your answers to equations involving rational expressions?

Rational expressions are in the form  $\frac{f(x)}{g(x)}$ ,  $g(x) \neq 0$ .

To solve rational equations, follow these steps:

1. Factor, if necessary, to determine the least common denominator (LCD).
2. Multiply each term of the equation by the LCD.
3. Simplify all terms, then get 0 on one side of the equation.
4. Solve the resulting equation by factoring or quadratic formula.
5. Check your answers in the original equation. Sometimes one or more of the answers won't work in the original equation. These are called **EXTRANEOUS** solutions.

examples....

1. Solve for  $x$ :  $x + \frac{1}{x-4} = 0$

2. Solve for  $x$ :  $\frac{2x}{x-1} + \frac{1}{x-3} = \frac{2}{x^2 - 4x + 3}$

3. Solve for  $x$ :  $\frac{x-3}{x} + \frac{3}{x+2} + \frac{6}{x^2+2x} = 0$

Applications

1. A rectangle has area  $200 \text{ m}^2$ . Find the dimensions of the rectangle if we want to minimize its perimeter.

2. How much pure acid must be added to 50 mL of 35% acid solution to produce a 75% acid solution?