## 15.7 Solving Rational Equations

**Rational Equation**: an equation that contains one or more rational expressions.

Ex. $\frac{2}{3}-\frac{5}{6}=\frac{1}{t}$, $\frac{a-1}{a-5}=\frac{4}{a^2-25}$, $x^3+\frac{6}{x}=5$

**To Solve a Rational Equation**

→ Multiply both sides of the equation by the **LCD**.

This is called ***clearing fractions*** and produces an equation similar to those we have already solved without fractions.

Ex. Solve and check.

(a) $\frac{2}{3}-\frac{1}{5}=\frac{7}{3x}$ Check:

(b) $\frac{2}{x}=\frac{x}{5x-12}$ Check:

(c) $\frac{2y}{y-2}=4+\frac{4}{y-2}$ Check:

*** **Recall:** Division by 0 is **undefined**. ***

When solving rational equations, do not forget to list any restrictions as the first step.

**Solving an Equation Containing Rational Expressions**

1. List all restrictions.
2. Find LCD.
3. $(EQUATION) \bullet LCD$ =>[clear fractions]
4. Solve the equation.
5. Check answer(s). Discard any extraneous solution(s).

Ex. Solve and check.

(a) $\frac{x}{x+1}+\frac{5}{x}=\frac{1}{x^2+x}$

Restrictions: _____

LCD: _____

(b) $\frac{2}{x+3}-\frac{3x+5}{x^2+4x+3}=\frac{5}{x+1}$

Restrictions: _____

LCD: _____