## Solving Rational Equations

If it is a proportion, set cross products equal.

$$\frac{7}{x-2} = \frac{11}{2x-10}$$

$11(x-2) = 7(2x-10)$

$11x - 22 = 14x - 70$

$-22 = 3x - 70$

$48 = 3x$

$16 = x$

- Factor all denominators.
- Find the Least Common Multiple (LCM)
- Multiply all terms by the LCM to remove all the fractions.

$$\frac{15}{x} + \frac{4}{5} = \frac{7}{x}$$

LCM: $5x$

$5x\left[\frac{15}{x} + \frac{4}{5} = \frac{7}{x}\right]$

$5x \cdot \frac{15}{x} = 75$

$5x \cdot \frac{4}{5} = 4x$

$5x \cdot \frac{7}{x} = 35$

$75 + 4x = 35$

$4x = -40$

$x = -10$

$$\frac{12}{x+7} = 1 - \frac{12}{x}$$

LCM: $x(x+7)$

$x(x+7)\left[\frac{12}{x+7} = 1 - \frac{12}{x}\right]$

$x(x+7) \cdot \frac{12}{x+7} = 12x$

$x(x+7) \cdot \frac{12}{x} = 12(x+7)$

$12x = x(x+7) - 12(x+7)$

$12x = x^2 + 7x - 12x - 84$

$12x = x^2 - 5x - 84$

$-12x \quad\quad -12x$

$0 = x^2 - 17x - 84$

$0 = (x-21)(x+4)$

$x - 21 = 0 \quad\quad x + 4 = 0$

$x = 21 \quad\quad x = -4$