

**Today's Date:****5.5 Solving Rational Equations**

Rational equations contain rational expressions. Once solved, we **MUST** check for **extraneous** solutions.

**Examples**

Solve each equation. Check your solution(s)!

$$(1) \frac{x}{x-4} + 1 = \frac{4}{x-4}$$


 $\nearrow x-4$ 
**Additional Examples**

$$(2) \frac{3x}{9x^2-1} + \frac{12}{3x+1} = \frac{5}{3x-1}$$

 $LCD: (3x+1)(3x-1)$ 

$$\frac{3x}{(3x+1)(3x-1)} + \frac{12(3x-1)}{(3x+1)(3x-1)} = \frac{5(3x+1)}{(3x-1)(3x+1)}$$

$$3x + 36x - 12 = 15x + 5$$

$$39x - 12 = 15x + 5$$

$$24x = 17$$

$$x = 17/24$$

## Additional Examples

LCD:  $(x+1)(x-1)$

$$(3) \frac{5x}{x-1} - 2 = \frac{14}{x^2-1}$$

$$\frac{5x(x+1)}{\text{LCD}} - \frac{2(x^2-1)}{\text{LCD}} = \frac{14}{\text{LCD}}$$

$$5x^2 + 5x - 2x^2 + 2 = 14$$

$$3x^2 + 5x - 12 = 0$$

$$(3x-4)(x+3) = 0$$

$$x = \frac{4}{3}, -3$$

## Additional Examples

$$(5) \frac{2}{x-3} - \frac{3}{x+1}$$

$$2(x+1) - 3(x-3)$$

$$2x + 2 = 3x - 9$$

$$x = 11$$