

## 2.7 Solving Equations in One Variable

- Obj: 1. Solve equations involving fractions  
 2. Identify extraneous solutions.

### Clearing Fractions

$$x \left( \frac{x}{1} \right) + \left( \frac{3}{x} \right) = \left( \frac{4}{1} \right) x \quad \text{LCD: } x$$

$$x^2 + 3 = 4x$$

-4x      -4x

$$x^2 - 4x + 3 = 0$$

$$(x-3)(x-1) = 0$$

$$x = 3, 1$$

Check:

$$3 + \frac{3}{3} = 4$$

$$4 = 4 \checkmark$$

$$1 + \frac{3}{1} = 4$$

$$4 = 4 \checkmark$$

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Solve:  $\frac{x-2}{3} + \frac{x+5}{3} = \frac{1}{3}$

LCD: 3

$$x-2 + x+5 = 1$$

$$2x + 3 = 1$$

-3    -3

$$2x = -2$$

$$x = -1$$

check:  $-\frac{1-2}{3} + \frac{-1+5}{3} = \frac{1}{3}$

$$-1 + \frac{4}{3} = \frac{1}{3}$$

$$\frac{1}{3} = \frac{1}{3} \checkmark$$

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$$(x-4)x + \left(\frac{1}{x-4}\right) = (0)x-4 \quad \text{LCD: } x-4$$

$$x^2 - 4x + 1 = 0$$

$$x = \frac{4 \pm \sqrt{16 - 4(1)(1)}}{2}$$

$$= \frac{4 \pm \sqrt{12}}{2} = \frac{4 \pm 2\sqrt{3}}{2} = 2 \pm \sqrt{3}$$

On a graph:  $y_1 = x + \frac{1}{x-4}$   
Find the zeros.

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$$x(x) + \left(\frac{10}{x}\right) = (7)x \quad \text{LCD: } x$$

$$x^2 + 10 = 7x$$

$$\begin{array}{r} -7x \quad -7x \\ \hline \end{array}$$

$$x^2 - 7x + 10 = 0$$

$$(x-5)(x-2) = 0$$

$$x = 2, 5$$

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

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

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

$$2x^2 - 6x + x - 1 = 2$$

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

$$(2x+1)(x-3) = 0$$

$x = \cancel{3}, \frac{1}{2}$   
extraneous

$$(2x^2 - 6x) + (x - 3) = 0$$

$$\textcircled{2x}(x-3) + \textcircled{1}(x-3) = 0$$

$$(x-3)(2x+1) = 0$$

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$$\left(\frac{3x}{x+5}\right) + \left(\frac{1}{x-2}\right) = \frac{7}{x^2+3x-10}$$

$$3x(x-2) + x+5 = 7$$

$$3x^2 - 6x + x + 5 = 7$$

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

$$(3x+1)(x-2) = 0$$

$x = \boxed{-\frac{1}{3}}, \cancel{2}$  extraneous

Oct 29-10:02 AM