

**Math 3**  
**Warm-Up**

$$2. \quad \frac{2}{6x-30} + \frac{7}{x-5} = \frac{2}{6(x-5)} + \frac{7}{x-5} \left(\frac{6}{6}\right)$$

$$\frac{2}{6(x-5)} + \frac{42}{6(x-5)} = \frac{2+42}{6(x-5)} = \frac{44}{6(x-5)} = \frac{22}{3(x-5)}$$

$x \neq 5$

$$\frac{6}{y+8} - \frac{3y}{y^2+11x+24}$$

*cancel 6*

$$\frac{y+3}{y+3} \cdot \frac{6}{y+8} - \frac{3y}{(y+8)(y+3)}$$

~~$\frac{24}{3 \cdot 8}$~~

$$\frac{6y+18}{(y+8)(y+3)} - \frac{3y}{(y+8)(y+3)}$$

$$\frac{y \neq -3, -8 \quad 3y+18}{(y+8)(y+3)}$$

Example 1  
**USING CROSS PRODUCTS**

**A**  $\frac{8}{x+7} = \frac{3}{x-3}$

$$8x - 24 = 3x + 21$$

$$\begin{array}{r} -3x \\ \hline 5x - 24 = 21 \end{array}$$

$$\begin{array}{r} 5x - 24 = 21 \\ +24 + 24 \\ \hline 5x = 45 \end{array}$$

$$\frac{5x}{5} = \frac{45}{5} \quad \boxed{x=9}$$

**B**  $\frac{x}{3x-7} = \frac{-3}{x-5}$

$$x^2 - 5x = -9x + 21$$

$$\begin{array}{r} +9x + 9x \\ \hline x^2 + 4x = 21 \end{array}$$

$$\begin{array}{r} x^2 + 4x = 21 \\ -21 - 21 \\ \hline x^2 + 4x - 21 = 0 \end{array}$$

$$\begin{array}{r} -21 \\ \times 7 \\ \hline -147 \end{array}$$

$$x^2 + 4x - 21 = 0$$

$$(x-3) = 0$$

$$x+7 = 0$$

$$\boxed{x=3, -7}$$

**Example 2**  
**MULTIPLY BY THE LCD**

A  $\frac{x}{x+7} - \frac{3}{x+7}$

$\frac{x}{x+7} - \frac{3x+21}{x+7} = \frac{-1}{x+7}$

$x + (3x+21) = -1$

$-2x - 21 = -1$

$\frac{-2x}{-2} = \frac{20}{-2} \quad (x = -10)$

B  $\frac{-2}{x-8} + \frac{x}{x-8}$

$\frac{-2}{x-8} + \frac{x^2-8x}{x-8} = \frac{7}{x-8}$

$-2 + x^2 - 8x = 7$

$-9 + x^2 - 8x = 0$

~~$x^2 - 8x - 9 = 0$~~

$(x-9) = 0 \quad (x+1) = 0$

~~$x = 9, -1$~~

**Example 3**  
**FACTOR TO FIND THE LCD**

A  $\frac{x+6}{x^2-4} = \frac{3}{x+2}$

$\frac{x+6}{(x-2)(x+2)} = \frac{3}{x+2} \left( \frac{x-2}{x-2} \right)$

B  $\frac{1}{x+3} + 2 = \frac{x^2-3}{x^2+2x+27}$

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

$(x+9) + 2(x^2+24x+54) = x^2-3$

$2x^2 + 25x + 63 = x^2 - 3$

$x^2 + 25x + 66 = 0$

$(x+22) = 0 \quad (x+3) = 0 \quad x = -22, -3$

$$1.) \frac{15}{x-6} + \frac{7x}{x-6} = \frac{-6}{x-6}$$

$$3.) \frac{3x}{7x} + \frac{1}{7} = \frac{4}{x}$$

$$5.) \frac{1}{7(x-3)} + \frac{4}{7} = \frac{3}{(x-3)}$$

$$1.) \frac{-4x}{x-8} - \frac{11}{x-8} = \frac{25}{x-8}$$

