

## Solve for x.

$$1. \frac{3x}{2} + \frac{1}{4}(x-2) = 10 \quad (\text{linear equation})$$

$$\frac{4}{1} \cdot \left[ \frac{3x}{2} + \frac{x}{4} - \frac{2}{4} = \frac{10}{1} \right] \quad \text{LCD} = 4$$

$$\frac{12x}{2} + \frac{4x}{4} - \frac{8}{4} = 40$$

$$\rightarrow 6x + x - 2 = 40$$

$$7x = 42$$

$$\boxed{x = 6}$$

## Solve for x.

$$2. \frac{1}{x-2} + \frac{3}{x+3} = \frac{4}{x^2+x-6} \quad \text{LCD} = (x-2)(x+3)$$

excluded values:  
 $x \neq 2 \quad x \neq -3$

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

$$\frac{\cancel{(x-2)}(x+3)}{\cancel{(x-2)}} + \frac{3\cancel{(x-2)}(x+3)}{\cancel{(x+3)}} = \frac{4\cancel{(x-2)}(x+3)}{\cancel{(x-2)}(x+3)}$$

$$\rightarrow x+3 + 3(x-2) = 4$$

$$x+3+3x-6=4$$

$$4x-3=4$$

$$4x=7$$

$$\boxed{x = 7/4}$$

Solve for x.

$$3. \frac{4x+1}{x+1} = \frac{12}{x^2-1} + 3$$

LCD:  $(x+1)(x-1)$   
 $x \neq \pm 1$

$$(x+1)(x-1) \left[ \frac{4x+1}{(x+1)} = \frac{12}{(x+1)(x-1)} + \frac{3}{1} \right]$$

$$(x-1)(4x+1) = 12 + 3(x+1)(x-1)$$

$$4x^2 - 3x - 1 = 12 + 3(x^2 - 1)$$

$$4x^2 - 3x - 1 = 12 + 3x^2 - 3$$

$$x^2 - 3x - 10 = 0 \text{ a quadratic equation } \textcircled{\text{!}}$$

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

$$x=5 \quad x=-2$$

Solve for x.

LCD:  
 $(x-2)(x-4)$

$x \neq 2, 4$

$$4. \frac{4}{x^2-6x+8} = \frac{3x}{x-2} + \frac{2}{x-4}$$

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

$$4 = 3x(x-4) + 2(x-2)$$

$$4 = 3x^2 - 12x + 2x - 4$$

$$0 = 3x^2 - 10x - 8$$

$$(3x+2)(x-4) = 0$$

$$x = -\frac{2}{3} \quad x=4$$