

**LEAST COMMON DENOMINATOR: Solve the equation by using the LCD. Check each solution.**

1.  $\frac{3x}{2x} + \frac{1(2)}{2x} = \frac{2(2x)}{2x}$

*Check*

$$\frac{3}{2} + \frac{1}{2} = 2$$

$$\frac{4}{2} = 2$$

$$2 = 2$$

$3x + 2 = 4x$   
 $-3x \quad -3x$   
 $2 = x \checkmark$

2.  $\frac{3}{x} + \frac{x}{x} = \frac{4 \cdot x}{x}$

*check (1)*

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

$$4 = 4$$

$3 + x^2 = 4x$   
 $-4x \quad -4x$   
 $x^2 - 4x + 3 = 0$   
 $(x-1)(x-3) = 0$   
 $x=1 \quad x=3$   
 $\checkmark \quad \checkmark$

*check (3)*

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

$$1 + 3 = 4$$

$$4 = 4$$

3.  $\frac{3}{2x} - \frac{9}{2} = 6x$

$x = -1$

4.  $\frac{8}{x+2} + \frac{8}{2} = 5$

$x = 6$

5.  $\frac{2x(3x)}{2x(x+1)} + \frac{6(x+1)}{2x(x+1)} = \frac{7 \cdot 2(x+1)}{x \cdot 2(x+1)}$

*check -2/3*

$$-6 - \frac{9}{2} = -\frac{21}{2}$$

$6x^2 + 6(x+1) = 14(x+1)$   
 $6x^2 + 6x + 6 = 14x + 14$   
 $-14x - 14 \quad -14x - 14$   
 $6x^2 - 8x - 8 = 0$   
 $2(3x^2 - 4x - 4) = 0$   
 $2(3x+2)(x-2) = 0$   
 $3x+2=0 \quad x-2=0$   
 $x = -\frac{2}{3} \quad x = 2$   
 $\checkmark \quad \checkmark$

*check 2*

$$\frac{6}{3} + \frac{6}{4} = \frac{7}{2}$$

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

$x = 2 \text{ OR } x = 3$

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**CROSS MULTIPLYING: Solve the equation by cross multiplying. Check each solution.**

7.  $\frac{3}{4x} = \frac{5}{x+2}$   
 $3(x+2) = 5(4x)$   
 $3x + 6 = 20x$   
 ~~$-3x$~~   ~~$-3x$~~   
 $6 = 17x$   
 $\frac{6}{17} = \frac{17x}{17}$   
 $x = \frac{6}{17}$

check  $\frac{6}{17}$   
 $\frac{17}{18} = \frac{17}{18} \checkmark$

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

check  $-\frac{1}{7}$   
 $-\frac{7}{2} = -\frac{7}{2} \checkmark$

9.  $\frac{x}{x^2-8} = \frac{2}{x}$   
 $x^2 = 2(x^2-8)$   
 $x^2 = 2x^2 - 16$   
 ~~$-x^2$~~   ~~$-x^2$~~   
 $0 = x^2 - 16$   
 $0 = (x-4)(x+4)$   
 $x = 4$  &  $x = -4$

check 4  
 $\frac{4}{8} = \frac{2}{4} \checkmark$   
 check -4  
 $\frac{-4}{8} = \frac{2}{-4} \checkmark$

10.  $\frac{9}{x+2} = \frac{8}{x}$

$x = 16$

11.  $\frac{5}{x+2} = \frac{3}{x-1}$

$x = \frac{11}{2}$

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

$x = 2$  OR  $x = -2$