

Clearing Fractions: Notes

Steps for Solving Multi-Step Equations with FRACTIONS $\frac{2}{3} \times 60$	1. Determine LCM of all the denominator
	2. Multiply entire equation by LCM
	3. simplify all fractions
	4. Solve the equation
	5. CHECK
	6.

EXAMPLES:

$$\left(\frac{2x}{7} + \frac{4x}{7} = -\frac{30}{7} \right) \times 7$$

$$2x + 4x = -30$$

$$\frac{6x}{6} = \frac{-30}{6}$$

$$\boxed{x = -5}$$

$$\left(\frac{5x}{9} + \frac{3x}{9} = \frac{24}{9} \right) \times 9$$

$$8x = 24$$

$$x = 3$$

NOTE: To clear fractions from an equation: Multiply EVERYTHING on both sides by a number that will cancel the denominators and remove the fractions

HINT: Answers can be fractions

Practice:

$$\text{LCM: } 2, 4 = 4$$

$$\left(\frac{1}{8}x - \frac{3}{8} = 5 \right) \cdot 8$$

$$\frac{8}{8}x - \frac{24}{8} = 40$$

$$x - 3 = 40$$

$$\begin{array}{c} +3 \quad +3 \\ \boxed{x = 43} \end{array}$$

$$\left(\frac{1}{4}x - \frac{3}{2} = 5 \right) \times 4$$

$$\frac{4}{4}x - \frac{12}{2} = 20$$

$$x - 6 = 20$$

$$\boxed{x = 26}$$

$$\text{LCM: } 7, 14, 2$$

$$\text{LCM} = 14$$

$$\left(\frac{1}{7}x - \frac{5}{14} = \frac{1}{2} \right) \times 14$$

$$\frac{14}{7}x - \frac{70}{14} = \frac{14}{2}$$

$$2x - 5 = 7$$

$$x = 6$$

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

$$\frac{12}{3}x + \frac{12}{12} = \frac{36}{4}$$

$$4x + 1 = 9$$

$$\begin{array}{c} 4x = 8 \\ \cdot \quad -1 \quad -1 \\ \frac{4x}{4} = \frac{8}{4} \end{array}$$

$$\rightarrow \boxed{x = 2}$$

$$\text{LCM: } 6, 8, 12 = 24$$

$$\left(\frac{1}{6}x - \frac{1}{8} = \frac{11}{12} \right) 24$$

$$\frac{24}{6}x - \frac{24}{8} = \frac{264}{12}$$

$$4x - 3 = 22$$

$$4x = 25$$

$$\boxed{x = \frac{25}{4}}$$

The process of clearing fractions will always work when solving equations that contain fractions.

Mistakes often occur when part of the equation is not a fractions.

Ex:

$$\frac{1}{4} + \frac{1}{2}x = 4$$

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

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

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

$$15x \left(\frac{1}{5}x + \frac{2}{3} - 2 = x - \frac{2}{3} \right)$$

$$3x + 10 - 30 = 15x - 10$$

$$\begin{array}{r} 3x - 20 = 15x - 10 \\ -15x \quad +20 \quad -15x \quad +20 \\ \hline \end{array}$$

$$-12x = 10 \quad x = -\frac{5}{6}$$

$$\begin{array}{r} 5x = -12 + 2x \\ -2x \quad \quad +2x \\ \hline \end{array}$$

$$\begin{array}{r} 3x = -12 \\ \underline{3} \quad \underline{3} \quad \underline{3} \end{array}$$

$$\boxed{x = -4}$$

WARM UP

Solve the equations.

$\frac{1}{3}x + 7 = 12$ $\quad \quad -7 \quad -7$ $\cancel{3} \times \frac{1}{3}x = 5 \times 3$ $x = 15$	$x + 21 = 36$ $\quad \quad -21 \quad -21$ $x = 15$
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Evaluate the expression

$3 \cdot \frac{1}{3}$ 1	$3 \cdot 7$ 21	$3 \cdot 12$ 36
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Define in your own words, what the Least Common Multiple LCM of two numbers is:

- Smallest number that the two numbers go into

Find the LCM of the following:

2 and 3

6

5, 10 and 15

30

4, 8, and 16

16

2, 3, 4, 5

60