**Steps To Solve Equations Containing Fractions**

1.  Write out original problem.

2.  Make all terms fractions by placing non-fractions over 1.

3.  On the side, factor all denominators and find **LCD** using factors in rows and columns.  Note:  Do not use (1) as a factor when finding the LCD.

4.  Rewrite each fraction with a longer fraction bar, put each numerator in a ( ), write each denominator with factors and ( )'s.  Put each side of the problem in [ ] and place the LCD in front of each [ ] as a fraction with a denominator of (1).

5.  Distribute factors of fraction in front of [ ] to each fraction inside.  Put each fraction in a [ ].

6.  Cancel like factors in each fraction.  Denominators will now have factors of just (1).

7.  Rewrite each fraction without a denominator and simplify.

8.  The equation will now have integers.  Follow previous steps for solving equations.

9.  On the "Check" if the answer is a fraction you can rewrite the equation so that fraction terms like, $\dfrac{2y}{3}$ can be rewritten as, $\dfrac{2}{3}y$.  This makes the check much easier when checking with a fraction.

    The following example shows why a fraction and variable can be rewritten.

$$\frac{2}{3}y$$

$$\frac{2}{3} \bullet y$$

$$\frac{2}{3} \bullet \frac{y}{1}$$

$$\frac{2 \bullet y}{3 \bullet 1}$$

$$\frac{2y}{3}$$

**Example of solving an equation with fractions follows on the next page.**

**Solve**

$$\frac{2y}{3} - \frac{3}{4} = \frac{5}{12}$$

$$\frac{(3)(2)(2)}{(1)}\left[\frac{(2y)}{(3)} - \frac{(3)}{(2)(2)}\right] = \frac{(3)(2)(2)}{(1)}\left[\frac{(5)}{(3)(2)(2)}\right]$$

$$\left[\frac{(\cancel{3})(2)(2)(2y)}{(1)(\cancel{3})}\right] - \left[\frac{(3)(\cancel{2})(\cancel{2})(3)}{(1)(\cancel{2})(\cancel{2})}\right] = \left[\frac{(\cancel{3})(\cancel{2})(\cancel{2})(5)}{(1)(\cancel{3})(\cancel{2})(\cancel{2})}\right]$$

$$\left[(2)(2)(2y)\right] - \left[(3)(3)\right] = \left[(5)\right]$$

$$\left[4(2y)\right] - \left[9\right] = 5$$
$$\left[8y\right] - 9 = 5$$
$$8y - 9 = 5$$
$$8y - 9 + 9 = 5 + 9$$
$$8y = 14$$
$$\frac{8y}{8} = \frac{14}{8}$$
$$y = \frac{7}{4}$$

**Check on next page.**

**Comments**

Write out original problem.

*Find the LCD as we did before using factors.*

| | |
|---|---|
| 3 | = (3) |
| 4 | =   (2) (2) |
| 12 | = (3) (2) (2) |
| LCD | = (3) (2) (2) |

Rewrite each fraction using ( ) in numerators, factor denominators, and put each side in [ ] with LCD in front.

Distribute factors of fraction in front to each fraction inside. Cancel like factors.

Simplify by making all terms without denominators.

Simplify and now follow steps on solving equations.

Check $\dfrac{2y}{3} - \dfrac{3}{4} = \dfrac{5}{12}$ for $y = \dfrac{7}{4}$

*rewrite,* $\dfrac{2}{3}y - \dfrac{3}{4} = \dfrac{5}{12}$

*Let* $y = \dfrac{7}{4}$

$\dfrac{2}{3}\left(\dfrac{7}{4}\right) - \dfrac{3}{4} \overset{?}{=} \dfrac{5}{12}$ $\qquad LCD = 12$

$\dfrac{14}{12} - \dfrac{3}{4} \overset{?}{=} \dfrac{5}{12}$

$\dfrac{14}{12} - \dfrac{3(3)}{4(3)} \overset{?}{=} \dfrac{5}{12}$

$\dfrac{14}{12} - \dfrac{9}{12} \overset{?}{=} \dfrac{5}{12}$

$\dfrac{14-9}{12} \overset{?}{=} \dfrac{5}{12}$

$\dfrac{5}{12} = \dfrac{5}{12}$ $\checkmark$

**The solution set is** $\left\{\dfrac{7}{4}\right\}$.