

More Multi-Step Equations with Fractions



In the previous tutorial, we solved a multi-step equation with fractions, using the solution path shown below.

- How would you summarize the calculation steps shown in this solution path?

$$\frac{x}{3} - \frac{3x}{2} = \frac{1}{6} - x$$

$$6\left(\frac{x}{3} - \frac{3x}{2}\right) = 6\left(\frac{1}{6} - x\right)$$

$$2x - 9x = 1 - 6x$$

$$-7x = 1 - 6x$$

$$\begin{array}{r} +6x \\ -7x = 1 - 6x \\ \hline \end{array}$$

$$\begin{array}{r} -1x \\ -1 \\ \hline \end{array}$$

$$x = -1$$

Focus on the calculations you perform when *multiplying both sides of the equation by the least common multiple*.

- Can you think of another way to show your work at this step of the solution?

$$\frac{x}{3} - \frac{3x}{2} = \frac{1}{6} - x$$

$$6\left(\frac{x}{3} - \frac{3x}{2}\right) = 6\left(\frac{1}{6} - x\right)$$

- Does your alternate approach for showing the multiplication, change your thinking as you perform each calculation?
- What calculation error might you be trying to avoid when choosing which way you'll show your work?



Let's compare the look of our previous example... $\frac{x}{3} - \frac{3x}{2} = \frac{1}{6} - x$

To a new equation $\frac{3y+4}{5} - \frac{y+2}{2} = \frac{4y-1}{10}$

How would you describe the look of our new equation as being different to our previous example?

A student begins solving the new equation by multiplying both sides to clear the fractions. Consider the first steps of their solution:

- Can you identify where in the solution the student makes a calculation error?

$$\frac{3y+4}{5} - \frac{y+2}{2} = \frac{4y-1}{10}$$
$$10\left(\frac{3y+4}{5} - \frac{y+2}{2}\right) = 10\left(\frac{4y-1}{10}\right)$$

$$\frac{30y+40}{5} - \frac{10y+20}{2} = \frac{40y-10}{10}$$

- How would you correct this student's thinking and help them avoid the calculation error?
- How would showing your work as...
multiplying each term by the LCM help you avoid this error?

$$6y+8-5y+10=4y-1$$



A classmate also prepared to solve the same equation by clearing the fractions. However, their approach for performing the math looks slightly different to our previous solution.

- How would you describe or explain their approach in performing the calculations that clear the fractions?

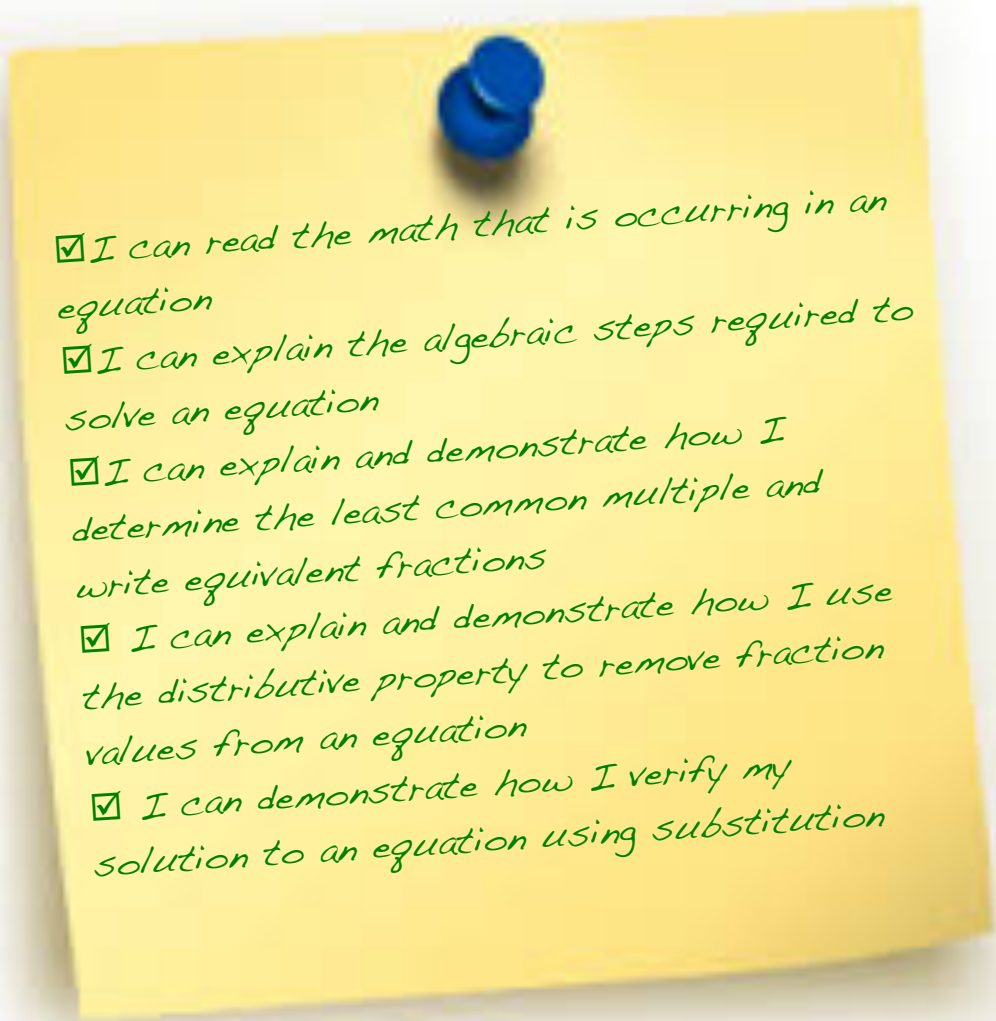
$$\begin{aligned}\frac{3y+4}{5} - \frac{y+2}{2} &= \frac{4y-1}{10} \\ 2\left(\frac{3y+4}{\cancel{5}}\right) - 5\left(\frac{y+2}{\cancel{2}}\right) &= 1\left(\frac{4y-1}{\cancel{10}}\right) \\ 2(3y+4) - 5(y+2) &= 4y-1 \\ 6y+8-5y-10 &= 4y-1\end{aligned}$$

- How would you explain and demonstrate the remainder of your solution?

$$\begin{aligned}\frac{3y+4}{5} - \frac{y+2}{2} &= \frac{4y-1}{10} \\ 10\left(\frac{3y+4}{5}\right) - 10\left(\frac{y+2}{2}\right) &= 10\left(\frac{4y-1}{10}\right) \\ 6y+8-5y-10 &= 4y-1\end{aligned}$$

- How would you explain and demonstrate verifying your solution using substitution?

More Multi-Step Equations with Fractions - Skills Checklist

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- ☒ I can read the math that is occurring in an equation
 - ☒ I can explain the algebraic steps required to solve an equation
 - ☒ I can explain and demonstrate how I determine the least common multiple and write equivalent fractions
 - ☒ I can explain and demonstrate how I use the distributive property to remove fraction values from an equation
 - ☒ I can demonstrate how I verify my solution to an equation using substitution



More Multi-Step Equations with Fractions - Worksheet

The Get It Guide™