Solving for $x$ with Fractions

Here’s an example of how to do it:

\[
\frac{1}{3} x + \frac{1}{4} = 7
\]

1st Find the Least Common Multiple of the Denominators

<table>
<thead>
<tr>
<th>Your 2 Denominators:</th>
<th>Multiply by 2</th>
<th>Multiply by 3</th>
<th>Multiply by 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

-Multiply them out until you find one that matches.

-3 and 4 share a LCM of 12.

-So we multiply the entire equation by 12

\[12 \left( \frac{1}{3} x \right) + 12 \left( \frac{1}{4} \right) = 12 \left( 7 \right)\]

We multiply out the 12 and each number/fraction to get:

\[\frac{12}{3} x + \frac{12}{4} = 84\]

We then divide each fraction...

\[12 \div 3 = 4 \quad \text{and} \quad 12 \div 4 = 3\]

\[4 x + 3 = 84\]

Last we solve for $x$...

\[4x \quad \cancel{+3} = 84\]

-So first we want to get rid of the constant, to do so

\[-\cancel{3} - 3\]

we must do the opposite of addition, which is subtraction

\[4x = 81\]

-Then we want to get rid of the constant in front of the $x$

\[\frac{4}{4} = 4\]

because we want the $x$ by itself. So we do the opposite of multiplication, which is division, and we get a fraction.

\[x = \frac{81}{4}\]

-And we want to keep it in fraction form.