

Solving Proportions Using Cross Multiplying

We previously showed how we can use cross multiplying to determine if fractions are equivalent. We can also use cross multiplying for many other things, one of the most important being in solving proportions. In solving a proportion, the idea we're going to use is that of *inverse operations*. The inverse of multiplication is _____ and we are going to need to use that when solving.

Example 1: Solve for x: $\frac{x}{6} = \frac{1}{2}$

First, we cross multiply. $2 \cdot x = 6 \cdot 1$

Then, we simplify. $2 \cdot x = 6$

Now, to get rid of the "2" in front of the "x", we have to use the inverse of multiplication, which is division, to make the 2 cancel out on the left-hand side. But, if we divide by "2" on one side, we have to do it to the other side as well.

$$\frac{2 \cdot x}{2} = \frac{6}{2}$$

On the left side, the "2"s cancel. $\frac{2 \cdot x}{2} = 3$ On the right side, $6 \div 2$ is 3.

So, we get... $x = 3$

Example 2: Solve for x: $\frac{15}{18} = \frac{x}{12}$

Answers to proportions do not always have to be whole numbers. Sometimes they will be mixed numbers.

Example 3: Solve for x: $\frac{x}{7} = \frac{5}{8}$

Also, the variable doesn't always have to be on top. The variable can be anywhere you want it to be.

Example 4: Solve for x: $\frac{9}{11} = \frac{15}{x}$

Solve for x in the problems below:

1) $\frac{21}{10} = \frac{12}{x}$

2) $\frac{4}{3} = \frac{x}{15}$

3) $\frac{10}{x} = \frac{12}{14}$