

How To Cross Multiply Fractions

Equivalent Fractions

Equivalent fractions are fractions that are equal to the same amount. So, $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent fractions. Also, $\frac{3}{9}$ and $\frac{1}{3}$ are equivalent.

What is an equivalent fraction to $\frac{1}{4}$?

$$\frac{2}{8}$$

$$\frac{3}{12}$$

$$\frac{4}{16}$$

$$\frac{5}{20}$$

Proportions

A proportion is when two fractions are set equal to each other. We can also call these two fractions ratios. So, when two ratios are equivalent, they form a proportion.

$$\frac{1}{4} = \frac{4}{16} \text{ is a proportion}$$

Proportions - Cross Products Are Equal

When you are given a proportion, you can draw an imaginary x from one numerator to the opposite denominator and from one denominator to the opposite numerator. When you multiply these opposites, the products will be equal!

$$\frac{3}{6} = \frac{1}{2} \rightarrow 3 \times 2 = 6 \times 1$$

Proportions - Cross Products Are Equal

Try It!

What are the cross products of these proportions?

1. $\frac{4}{5} = \frac{8}{10}$

1. 40

2. $\frac{1}{3} = \frac{4}{12}$

2. 12

3. $\frac{3}{4} = \frac{12}{16}$

3. 48

4. $\frac{1}{6} = \frac{3}{18}$

4. 18

5. $\frac{1}{20} = \frac{2}{40}$

5. 40

Proportions - Finding the Unknown

Sometimes we are given a proportion, but one value (either denominator or either numerator) is unknown. We can use cross products or cross multiplication to find this missing value.

For example:

$$n/5 = 16/20$$

To find the value of n , we can use cross products. Set $20 \times n = 5 \times 16$.

So, $20n = 80$. What number times 20 is equal to 80? 4.

That means $n = 4$.

Let's check our work using cross products. Does $4 \times 20 = 5 \times 16$?

Yes! So we are correct!

Proportions - Finding the Unknown

Here is another example:

$$\frac{2}{3} = \frac{12}{r}$$

To find the value of r , we can use cross products. Set $2 \times r = 3 \times 12$.

So $2r = 36$. What number times 2 is equal to 36? 18.

That means $r = 18$.

Let's check our work using cross products. Does $2 \times 18 = 3 \times 12$ Yes!

So we are correct!

Proportions - Finding the Unknown: Try It!

Find the unknown.

1. $\frac{5}{6} = \frac{x}{18}$

1. $x = 15$

2. $\frac{4}{5} = \frac{n}{25}$

2. $n = 20$

3. $\frac{1}{3} = \frac{3}{s}$

3. $s = 9$

4. $\frac{y}{4} = \frac{8}{32}$

4. $y = 1$

5. $\frac{6}{x} = \frac{42}{49}$

5. $x = 7$

