

## **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  $\frac{1}{4}$ ?



## **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.



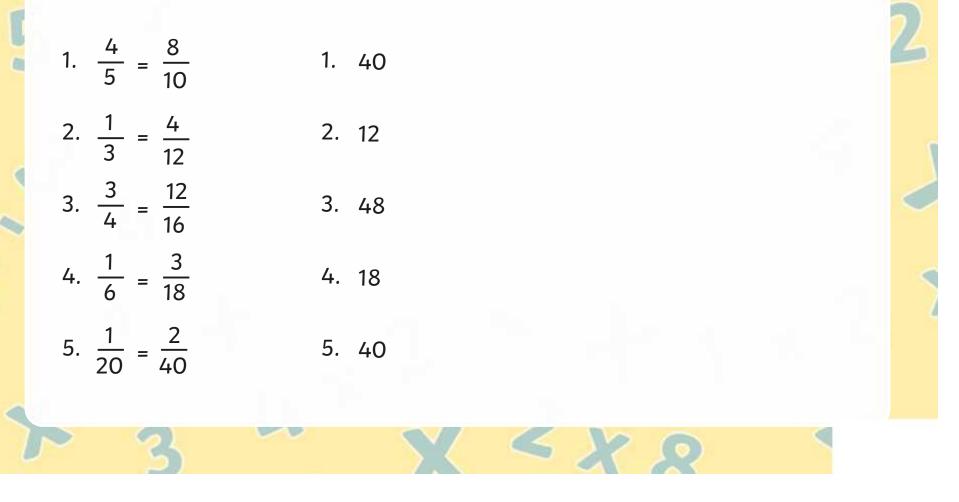
#### **Proportions - Cross Products Are Equal**

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!

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

### Proportions - Cross Products Are Equal Try It!

What are the cross products of these proportions?



# **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 x n = 5 x 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 x 20 = 5 x 16? Yes! So we are correct!

## **Proportions - Finding the Unknown**

Here is another example:

2/3 = 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 x 18 = 3 x 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 = 203.  $\frac{1}{3} = \frac{3}{s}$ 3. s = 9 4.  $\frac{y}{4} = \frac{8}{32}$ 4. y = 1 5.  $\frac{6}{x} = \frac{42}{49}$ 5. x = 7

