



Ratios - Worksheet

What is a ratio?

A ratio is an expression which compares two values to illustrate how much larger one is to another.

Ratios can be written in three different ways:

- Using the ':' symbol (2:7)
- Using 'to' in between the numbers (2 to 7)
- Writing it like a fraction i.e. $\frac{2}{7}$

Reducing the ratio

This process is followed to express a ratio in its simplest form.

Example

The ratio of male students to female students in a class is 25:35. That means for every 25 male students there are 35 female students.

But we can reduce this ratio to a simpler form:

As we can see both numbers have 5 in common, so we can reduce both the numbers by dividing them by '5'. Then we get 5:7. So for every 5 male students, there are 7 female students in the class.

Please note:

If there are 35 male students and 25 female students in the class, and the question asks for **male to female ratio**, the number of male students should be on left side and the number of female students on the right side. The ratio should be 35:25 **not** 25:35.

If the ratio is written in a fraction form, the number of male students should go on top and the number of female students would be the denominator, that is, $\frac{35}{25}$.

Writing these expressions the other way around would mark your answer wrong.

Solving Ratio Problems

Example

A class has 25 students, of which 15 are males and the rest are females. What is the ratio of males to female students?

Answer

Total students = 25

Male students = 15

So, female students = $(25 - 15) = 10$

Ratio of male to female students = $15:10 = 3:2$ (reduced)

So, for every 3 male students there are 2 female students.

Understanding relationship with the whole

Example

A class has 25 students of which 15 are males. What proportion of the class is male?

Answer

So, the ratio of male students to the whole class is, $15:25$ or $3:5$ (reduced)

Or, we could write it as a fraction, $\frac{3}{5}$

So, we can say that $\frac{3}{5}$ th of the class is male students.

Understanding Proportion

A proportion is an equation that expresses two equivalent ratios.

That is, $\frac{x}{y} = \frac{z}{p}$; and if one value is missing, you could solve the equation and find it.

Example

A recipe says that to make 6 muffins you need 1 cup of butter. If you want to make 4 muffins how much butter do you need to add to the mixture?

So, the ratio of butter to muffins:

$$\frac{\text{butter}_1}{\text{muffins}_1} = \frac{\text{butter}_2}{\text{muffins}_2}$$

(Make sure you write both the ratios in the same format, that is either butter to muffins or muffins to butter)

So, from the question we get, $\frac{1}{6} = \frac{z}{4}$

Now, we need to solve to get the value of **z**.

$$\frac{1}{6} \times 4 = \frac{z}{4} \times 4$$

$$\frac{4}{6} = z$$

$z = \frac{2}{3}$; So, you need **2/3rd cups** of butter to make 4 muffins.

Practice Exercises

Question 1

Reduce the following ratios:

No.	Ratios	Answer
1	35:25	
2	105:25	
3	12:6	
4	18:54	
5	27:81	

Question 2

Change the ratios into fraction format:

No.	Ratios	Answer
1	35:25	
2	105:25	
3	12:6	
4	18:54	
5	27:81	

Question 3

Kylie wants to buy a pack of stickers in which there would be 5 green stickers for every 15 red stickers. She found two packs: one pack has 20 green stickers and 45 red stickers; the other pack has 27 red stickers and 9 green stickers. Which pack should she choose?

Question 4

James has two friends living in Perth, 4 in Brisbane and 3 in Melbourne. What is the ratio of his friend living in Melbourne to those who are living in Perth?

Question 5

In a solution, 2 parts of glucose water need to be mixed in 3 parts of regular water. If you have 450ml of regular water, how much glucose water would you mix?

Question 6

While making rice pudding, Alice's mum always puts 4 tablespoons of sugar in 1 L milk. Alice is following her mum's recipe to make rice pudding with 3L of milk. She has already put 5 tablespoons of sugar in the milk. How much more does she need to put in?