

GCSE Maths – Ratio, Proportion and Rates of Change

Interpreting Percentages

Notes

WORKSHEET



This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



Interpreting Percentages

A percentage is a way of expressing a proportion as “**the number of parts per hundred**”.

- 1% is the same as 1 in 100
- 30% is the same as 30 in 100.

Percentages to Decimals

To convert a percentage to a decimal, you must divide the percentage by 100. The ‘%’ sign must then be removed.

It is very useful to convert between percentages and decimals for the purpose of calculations.

The decimal obtained from a percentage is known as a **decimal multiplier**. To find a percentage of an amount, **multiply** the amount by the decimal multiplier of the percentage we are trying to find.

Example: Write 65% as a decimal.

Divide the percentage by 100 and **remove the % sign**.

$$65 \div 100 = 0.65$$

Example: A chair normally costs £300. In a sale, the price is reduced to 70% of the normal price. What is the sale price?

Find 70% **as a decimal multiplier**, by **converting** it to a decimal.

$$70 \div 100 = 0.7$$

Multiply the decimal multiplier by the normal price.

$$0.7 \times \text{£}300 = \text{£}210$$

Percentages to Fractions

Since percentages are the number of parts per 100, by putting the number as a **numerator** over a **denominator of 100**, we can create a **fraction**.

To convert a fraction to a percentage, **treat the fraction as a division sum**, and **multiply** the answer by 100.



Example: Write 42% as a fraction.

Put the percentage over 100 to form a fraction.

$$42\% = \frac{42}{100}$$

Simplify the fraction where possible.

$$\frac{42}{100} = \frac{21}{50}$$

Expressing and Comparing Percentages

To write a value as a percentage, use this equation:

$$\text{Percentage} = \frac{\text{Value}}{\text{Total}} \times 100$$

Percentages can exceed 100%, which can be seen when working with money problems.

Example: Sandra scored 30 marks on a test with a total of 150 marks. What percentage did she score on this test?

Use the equation for working out a percentage, and **substitute** in Sandra's mark and the total marks.

$$\text{Percentage} = \frac{\text{Value}}{\text{Total}} \times 100$$

$$\begin{aligned}\text{Percentage} &= \frac{30}{150} \times 100 \\ &= 20\%\end{aligned}$$

Example: 200 people took course A and 125 people took course B. 188 people passed course A and 110 people passed course B. Which course had the highest pass rate?

Using the equation for working out a percentage, calculate the pass rate for course A.

$$\text{Percentage} = \frac{\text{Value}}{\text{Total}} \times 100 = \frac{188}{200} \times 100 = 94\%$$

Using the same equation, repeat to calculate the pass rate for course B.

$$\text{Percentage} = \frac{110}{125} \times 100 = 88\%$$

Compare the percentage pass rate of course A and B.

Since $94\% \geq 88\%$, course A has the higher pass rate.



Interpreting Percentages - Practice Questions

1. The price of a microwave is reduced by 25% in a clearance sale. If the original price was £160, what is it sold for in the sale?
2. Order the following values by increasing size:

$$42\%, \frac{5}{8}, 0.2, 90\%, \frac{8}{9}$$

3. In a competition, 40% of the contestants are eliminated in round one. In round two, 50% of the remaining contestants are eliminated. If 140 people started the competition, how many go into round three?
4. A special edition box of cereal contains 30% more food. If the special edition box weighs 390 g, how much does the cereal normally weigh?
5. A blender is on sale across several stores.

<p>STORE A original price: £160 sale: 15% reduction</p>	<p>STORE B original price: £200 sale: buy blender for $\frac{3}{8}$ off</p>
---	--

Emily wants to buy a blender. Which store should she buy it from?

Worked solutions for the practice questions can be found amongst the worked solutions for the corresponding worksheet file.

