

Converting Fractions, Decimals and Percentages

Solutions

For AQA GCSE Mathematics (8300) • Foundation tier

Each question is shown in grey, followed by the working, one step per line. The final answer is in a box. *Marks* shows how the marks are usually given in the exam, and **Tip** points out a common mistake.

1 (3 marks)

Complete the table.

Give fractions in their simplest form.

Fraction	Decimal	Percentage
$\frac{1}{4}$		
	0.6	
		5%

Row 1: $\frac{1}{4} = 1 \div 4 = 0.25$ and $0.25 \times 100 = 25\%$

Row 2: $0.6 \times 100 = 60\%$

$0.6 = \frac{6}{10} = \frac{3}{5}$

Row 3: $5\% = 5 \div 100 = 0.05$

$$5\% = \frac{5}{100} = \frac{1}{20}$$

Answer: 0.25, 25%; $\frac{3}{5}$, 60%; $\frac{1}{20}$, 0.05

Tip: 5% is 0.05, not 0.5. Percent means “out of 100”, so divide by 100: move the digits two places.

Marks: 3 marks for all six correct. 2 marks for four or five correct. 1 mark for two or three correct.

2 (4 marks)

- (a) Write $\frac{11}{25}$ as a percentage.

Make the bottom 100. Multiply top and bottom by 4:

$$\frac{11}{25} = \frac{44}{100}$$

$$\frac{44}{100} = 44\%$$

Answer: 44%

- (b) Write 0.08 as a fraction in its simplest form.

The 8 is in the hundredths column.

$$\text{So } 0.08 = \frac{8}{100}$$

Divide top and bottom by 4: $\frac{8}{100} = \frac{2}{25}$

Answer: $\frac{2}{25}$

- (c) Write 125% as a decimal.

To change a percentage to a decimal, divide by 100.

$$125 \div 100 = 1.25$$

Answer: 1.25

- (d) Write $\frac{5}{8}$ as a decimal.

A fraction means top $\div$ bottom.

$$5 \div 8 = 0.625$$

(Or: $\frac{1}{8} = 0.125$, so $\frac{5}{8} = 5 \times 0.125 = 0.625$)

Answer: 0.625

Tip: Do not just write the digits after a decimal point: $\frac{5}{8}$ is not 0.58. Work out $5 \div 8$.

3 (1 mark)

Circle the fraction that is equal to 40%

Options: $\frac{1}{40}$, $\frac{1}{4}$, $\frac{2}{5}$, $\frac{40}{10}$

Percent means “out of 100”.

$$40\% = \frac{40}{100}$$

Divide top and bottom by 20: $\frac{40}{100} = \frac{2}{5}$

Answer: $\frac{2}{5}$

Tip: $\frac{1}{4}$ is 25%, not 40%. Always write the percentage over 100 first, then simplify.

4 (1 mark)

Grace says,

$$‘\frac{1}{5} = 0.5’$$

Is she correct? Tick a box.

Give a reason for your answer.

$$\frac{1}{5} = 1 \div 5 = 0.2$$

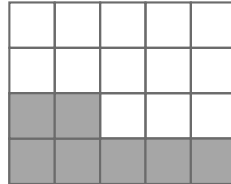
0.5 is $\frac{1}{2}$, not $\frac{1}{5}$.

So Grace is wrong.

Answer: No, $\frac{1}{5} = 0.2$

5 (2 marks)

Here is a shape made from squares.



What percentage of the shape is shaded?

Count the squares: there are $5 \times 4 = 20$ squares in total.

7 squares are shaded.

So $\frac{7}{20}$ of the shape is shaded.

Multiply top and bottom by 5: $\frac{7}{20} = \frac{35}{100} = 35\%$

Answer: 35%

Tip: The percentage is not the number of shaded squares. Write shaded out of the **total** first, then change it to a percentage.

Marks: 1 mark for $\frac{7}{20}$. 1 mark for 35%.

6 (1 mark)

Write $\frac{2}{3}$ as a percentage. Give your answer to 1 decimal place.

$2 \div 3 = 0.6666 \dots$

Multiply by 100: 66.666 ... %

To 1 decimal place: 66.7%

Answer: 66.7%

7 (2 marks)

Write these in order of size, starting with the smallest.

$$0.4 \quad \frac{3}{8} \quad 42\% \quad \frac{9}{20}$$

Change them all to decimals.

$$0.4 = 0.400$$

$$\frac{3}{8} = 3 \div 8 = 0.375$$

$$42\% = 0.42$$

$$\frac{9}{20} = \frac{45}{100} = 0.45$$

In order: 0.375, 0.400, 0.42, 0.45

Answer: $\frac{3}{8}$, 0.4, 42%, $\frac{9}{20}$

Tip: Write your answer using the numbers as they were given in the question, not your decimals. Show the conversions so you can get the method mark.

Marks: 1 mark for changing them all to the same form. 1 mark for the correct order.

8 (2 marks)

Asha scored 34 out of 40 in a test.

Ben scored 42 out of 50 in a different test.

Who scored the higher percentage?

You must show your working.

$$\text{Asha: } \frac{34}{40}$$

$$34 \div 40 = 0.85 = 85\%$$

$$\text{Ben: } \frac{42}{50}$$

Multiply top and bottom by 2: $\frac{84}{100} = 84\%$

85% is higher than 84%.

Answer: Asha (85% compared with 84%)

Marks: 1 mark for working out either percentage. 1 mark for Asha with both percentages.

9 (2 marks)

Three netball players each took shots at goal in a season.
The proportion of her shots that each player scored is shown.

Player	Rhiannon	Nerys	Ifeoma
Proportion scored	0.805	$\frac{4}{5}$	81%

Write the three names in order, starting with the player who scored the **greatest** proportion of her shots.

Change them all to decimals with three decimal places.

Rhiannon: 0.805

Nerys: $\frac{4}{5} = 0.800$

Ifeoma: 81% = 0.810

So $0.810 > 0.805 > 0.800$

Answer: Ifeoma, Rhiannon, Nerys

Tip: Give decimals the same number of decimal places before you compare them. 0.81 is bigger than 0.805, because $0.810 > 0.805$. Also check which way round the order should go.

Marks: 1 mark for 0.8 and 0.81 (or 80%, 80.5% and 81%). 1 mark for the correct order.

10 (3 marks)

Some students each chose their favourite sport.

$\frac{3}{8}$ of the students chose football.

0.25 of the students chose tennis.

15% of the students chose swimming.

The rest of the students chose running.

What percentage of the students chose running?

Change everything to percentages.

Football: $\frac{3}{8} = 3 \div 8 = 0.375 = 37.5\%$

Tennis: $0.25 = 25\%$

Swimming: 15%

All the students make 100%.

Running: $100 - 37.5 - 25 - 15 = 22.5\%$

Answer: 22.5%

Marks: 1 mark for 37.5% or 25%. 1 mark for $100 - (37.5 + 25 + 15)$. 1 mark for 22.5%.
