

Converting Fractions, Decimals and Percentages

Solutions

For Pearson Edexcel GCSE Mathematics (1MA1) • 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 (4 marks)

- (a) Write $\frac{9}{25}$ as a percentage.

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

$$\frac{9}{25} = \frac{36}{100}$$

$$\frac{36}{100} = 36\%$$

Answer: 36%

- (b) Write 0.7 as a fraction.

The 7 is in the tenths column.

$$\text{So } 0.7 = \frac{7}{10}$$

Answer: $\frac{7}{10}$

- (c) Write 4% as a decimal.

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

$$4 \div 100 = 0.04$$

Answer: 0.04

Tip: 4% is 0.04, not 0.4. Dividing by 100 moves the digits **two** places. (0.4 would be 40%.)

(d) Write 45% as a fraction in its simplest form.

Percent means “out of 100”: $45\% = \frac{45}{100}$

Divide top and bottom by 5: $\frac{45}{100} = \frac{9}{20}$

Answer: $\frac{9}{20}$

2 (3 marks)

Complete the table.

Give fractions in their simplest form.

Fraction	Decimal	Percentage
$\frac{3}{4}$		
	0.2	
		16%

Row 1: $\frac{3}{4} = 3 \div 4 = 0.75$ and $0.75 \times 100 = 75\%$

Row 2: $0.2 \times 100 = 20\%$

$$0.2 = \frac{2}{10} = \frac{1}{5}$$

Row 3: $16\% = 16 \div 100 = 0.16$

$$16\% = \frac{16}{100} = \frac{4}{25} \text{ (divide top and bottom by 4)}$$

Answer: 0.75, 75%; $\frac{1}{5}$, 20%; $\frac{4}{25}$, 0.16

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

3 (2 marks)

Write 0.125 as a fraction in its simplest form.

The last digit, 5, is in the thousandths column.

$$\text{So } 0.125 = \frac{125}{1000}$$

Divide top and bottom by 125:

$$\frac{125}{1000} = \frac{1}{8}$$

Answer: $\frac{1}{8}$

Marks: 1 mark for $\frac{125}{1000}$ (or an equivalent fraction). 1 mark for $\frac{1}{8}$.

4 (1 mark)

Hugo says $\frac{3}{10} = 3\%$

Explain why Hugo is wrong.

$$\frac{3}{10} = 0.3$$

$$0.3 \times 100 = 30\%$$

So $\frac{3}{10}$ is 30%, not 3%.

Answer: $\frac{3}{10} = 30\%$, not 3%

5 (1 mark)

Write $\frac{5}{6}$ as a decimal.

A fraction means top $\div$ bottom.

$$5 \div 6 = 0.8333 \dots$$

The 3 repeats for ever. We can write this as $0.8\dot{3}$.

Answer: 0.83... (or $0.8\dot{3}$)

Tip: Divide the top by the bottom ($5 \div 6$), not the bottom by the top ($6 \div 5 = 1.2$).

6 (2 marks)

Write these numbers in order of size.

Start with the smallest number.

$$\frac{2}{3} \quad 0.6 \quad 65\% \quad \frac{5}{8}$$

Change them all to decimals.

$$\frac{2}{3} = 2 \div 3 = 0.666 \dots$$

$$0.6 = 0.600$$

$$65\% = 0.650$$

$$\frac{5}{8} = 5 \div 8 = 0.625$$

In order: 0.600, 0.625, 0.650, 0.666 ...

Answer: 0.6, $\frac{5}{8}$, 65%, $\frac{2}{3}$

Tip: Use at least 2 or 3 decimal places. To 1 decimal place, 0.6 and $\frac{5}{8}$ both give 0.6, and 65% and $\frac{2}{3}$ both give 0.7, so you cannot put them in order.

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

7 (2 marks)

Which is the better score, 17 out of 20 or 21 out of 25?
You must show how you get your answer.

Change both scores to percentages.

$\frac{17}{20}$: multiply top and bottom by 5: $\frac{85}{100} = 85\%$

$\frac{21}{25}$: multiply top and bottom by 4: $\frac{84}{100} = 84\%$

85% is higher than 84%.

Answer: 17 out of 20 (85% compared with 84%)

Marks: 1 mark for changing both scores to percentages (or decimals). 1 mark for 17 out of 20 with both values shown.

8 (3 marks)

In a survey, $\frac{7}{20}$ of people chose tea, 0.4 chose coffee and the rest chose hot chocolate.
What percentage of people chose hot chocolate?

Change everything to percentages.

Tea: $\frac{7}{20} = \frac{35}{100} = 35\%$

Coffee: $0.4 \times 100 = 40\%$

Everyone together is 100%.

Hot chocolate: $100 - 35 - 40 = 25\%$

Answer: 25%

Tip: 0.4 is 40%, not 4%.

Marks: 1 mark for 35%. 1 mark for adding and subtracting from 100%. 1 mark for 25%.

9 (2 marks)

$\frac{3}{5}$ of the students in a school are girls.

40% of the girls wear glasses.

What fraction of all the students are girls who wear glasses?

Change 40% to a fraction: $40\% = \frac{40}{100} = \frac{2}{5}$

We need $\frac{2}{5}$ of $\frac{3}{5}$.

“Of” means multiply: $\frac{2}{5} \times \frac{3}{5} = \frac{6}{25}$

Answer: $\frac{6}{25}$

Tip: The 40% is of the girls, not of all the students. So multiply, do not add or subtract.

Marks: 1 mark for $\frac{3}{5} \times \frac{2}{5}$ (or 0.6×0.4). 1 mark for $\frac{6}{25}$.

10 (3 marks)

Oskar is reading a book.

On Monday he reads $\frac{1}{5}$ of the pages in the book.

On Tuesday he reads 0.35 of the pages in the book.

He now has 108 pages left to read.

How many pages are there in the book?

Change $\frac{1}{5}$ to a decimal: $\frac{1}{5} = 0.2$

On Monday and Tuesday he read $0.2 + 0.35 = 0.55$ of the pages.

So the pages left are $1 - 0.55 = 0.45$ of the book.

0.45 is 45%.

45% is 108 pages.

5% is $108 \div 9 = 12$ pages.

100% is $12 \times 20 = 240$ pages.

Answer: 240

Tip: The 108 pages are what is **left**, not what he has read. Find the fraction of the book that is left first.

Marks: 1 mark for $\frac{1}{5} = 0.2$ (or 20%) and adding it to 0.35. 1 mark for $1 - 0.55 = 0.45$ (or 45%). 1 mark for 240.
