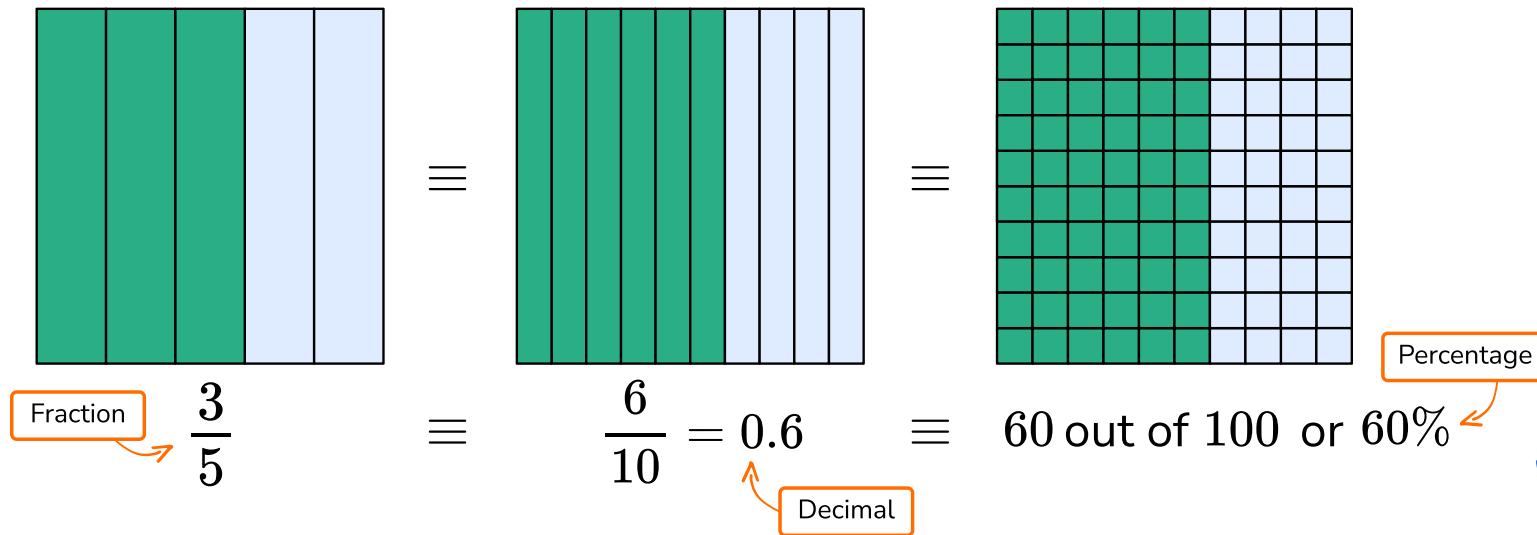


Converting Fractions, Decimals and Percentages

Fractions, decimals and percentages are three different ways to express the same number or proportion of a quantity.

 Example



Converting Between Percentages and Fractions

Percentage to fraction

To convert a **percentage to a fraction**, write the percentage as a fraction out of 100 and then cancel to its simplest form.

 **Example** Write 40% as a fraction.

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

Percent means "out of 100" so 40% is 40 out of 100


$$\frac{40}{100} \xrightarrow{\div 10} \frac{4}{10} \xrightarrow{\div 2} \frac{2}{5}$$

Cancel the fraction to its simplest form.

So 40% as a fraction is $\frac{2}{5}$

Fraction to percentage (equivalent fractions)


If the denominator is a factor of 100, you can use equivalent fractions to do the conversion.

 **Example** Write $\frac{3}{4}$ as a percentage.

$$\frac{3}{4} \xrightarrow{\times 25} \frac{75}{100} = 75\%$$

75 out of 100 is 75%

Fraction to percentage (division)

 **Example** Write $\frac{5}{8}$ as a percentage.

$$\frac{5}{8} = 5 \div 8 = 0.625 = 62.5\%$$

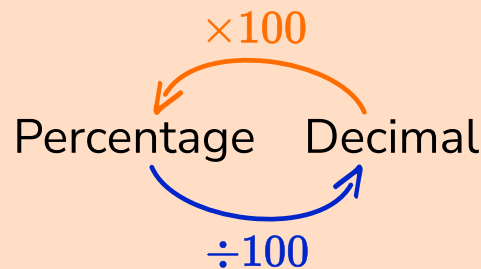
3 Change decimal to percentage ($\times 100$)


1 Write the fraction as a division.

2 Use short division to work out the answer as a decimal.

Converting Between Decimals and Percentages


To convert between percentages and decimals, we use the idea that percent means “out of 100” or “hundredths”.



 **Example** Write 45% as a decimal.

Percentage $\xrightarrow{\div 100}$ Decimal

$$45\% \rightarrow 45 \div 100 \rightarrow 0.45$$

 **Example** Write 0.72 as a percentage.

Decimal $\xrightarrow{\times 100}$ Percentage

$$0.72 \rightarrow 0.72 \times 100 \rightarrow 72\%$$

Converting Between Fractions and Decimals


Decimal to fraction

To convert a decimal to a fraction, look at the place value of the digits in the decimal.

 **Example** Write 0.43 as a fraction.

$$0.43 = \frac{43}{100}$$

The lowest place value is **hundredths**.

 **Example** Write 0.245 as a fraction.

$$0.245 = \frac{245}{1000} \div 5 = \frac{49}{200}$$

The lowest place value is **thousandths**.

Simplify if possible.

Fraction to decimal

To convert a fraction to a decimal, write the fraction as an equivalent division and work out the answer.

 **Example** Write $\frac{2}{5}$ as a decimal.

1 Write the fraction as a division: $\frac{2}{5} = 2 \div 5$

2 Use short division to work out the answer as a decimal:

$$\begin{array}{r} 0.4 \\ 5 \overline{)2.0} \end{array}$$

$$\frac{2}{5} = 0.4$$

Converting Recurring Decimals to Fractions

We use an algebraic process to convert a recurring decimal to a fraction.



Example Write $0.\dot{2}\dot{6}$ as a fraction in its simplest form.

1 Write an equation with x equal to the recurring decimal:

$$x = 0.\dot{2}\dot{6}$$

2 Multiply by a power of 10 so that the recurring parts align:

$\times 100$ $\times 100$

$$100x = 26.\dot{2}\dot{6}$$

3 Subtract so that all of the recurring parts cancel out :

$$\begin{array}{r} 100x = 26.\dot{2}\dot{6} \\ x = 0.\dot{2}\dot{6} \\ \hline \end{array}$$

4 Rearrange to make x the subject: $99x = 26$

$\div 99$ $\div 99$

$$x = \frac{26}{99}$$

$$99x = 26.00\dots$$

Everything after the decimal point becomes 0.