



# Decimals

You can write a terminating decimal as a fraction with denominator 10, 100 or 1000.

$0.24 = \frac{24}{100} = \frac{6}{25}$  Simplify your fraction as much as possible.

To convert a fraction into a decimal you divide the numerator by the denominator.

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

It's useful to remember these common fraction-to-decimal conversions:

Fraction	$\frac{1}{100}$	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{3}{4}$
Decimal	0.01	0.1	0.5	0.2	0.25	0.75

## Recurring vs terminating

A terminating decimal can be written exactly as a decimal.

Recurring decimals have one digit or group of digits repeated forever. You can use dots to show the recurring digit or group of digits.

$\frac{2}{3} = 0.6666... = 0.\dot{6}$  The dot tells you that the 6 repeats forever.

$\frac{346}{555} = 0.6234234... = 0.6\dot{2}3\dot{4}$   
These dots tell you that the group of digits 234 repeats forever.

To check whether a fraction produces a recurring decimal or a terminating decimal, write it in its simplest form and find the prime factors of its denominator:

- Prime factors only 2 and 5 → terminating decimal
- Prime factors other than 2 or 5 → recurring decimal

$\frac{3}{20} = \frac{3}{2^2 \times 5}$  → terminating

$\frac{5}{24} = \frac{5}{2^3 \times 3}$  → recurring

## Worked example

Using the information that  $58 \times 71 = 4118$  write down the value of

(a)  $58 \times 0.71$

41.18

(b)  $5800 \times 7.1$

41 180



This question would appear on your non-calculator paper. You should use the information given in the question to save time.

(a) 71 has been divided by 100 and 58 hasn't been changed. So the answer needs to be divided by 100:  
 $4118 \div 100 = 41.18$

(b) 58 has been multiplied by 100 and 71 has been divided by 10.

$\boxed{\times 100} \rightarrow \boxed{\div 10}$  is the same as  $\boxed{\times 10}$

The answer needs to be multiplied by 10:  
 $4118 \times 10 = 41\ 180$

## Now try this



1. Using the information that  $23 \times 65 = 1495$  write down the value of

(a)  $0.23 \times 65$

(b)  $230 \times 0.65$

(2 marks)

2.  $97 \times 123 = 11\ 931$

Use this information to write down the answer to:

(a)  $9.7 \times 12.3$

(b)  $0.97 \times 123\ 000$

(c)  $11.931 \div 9.7$

(3 marks)

