

WelTec/Whitireia Mathematics Series

Decimals

Decimals are like fractions, as they show parts of a whole. This decimal 0.465 actually represents the following:

	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
0.	4	6	5

$$\text{So, } 0.465 = \frac{4}{10} + \frac{6}{100} + \frac{5}{1000}$$

They are easier to use than fractions, as all decimal numbers are a fraction or multiple of a power of **ten**. Often you can use a calculator with this kind of problem.

Example 1

a) $3.1 + 45 + 0.001$

b) $8 - 0.004$

Solution

a) To work this out, line up the decimal points.

$$\begin{array}{r}
 4 3 1 + \\
 4 5 0 \\
 0 0 0 \\
 \hline
 4 8 1 0 1
 \end{array}$$

b) Again, line up the decimal points.

$$\begin{array}{r}
 8 0 0 0 - \\
 0 0 0 4 \\
 \hline
 7 9 9 6
 \end{array}$$

Activity 1

Work out the following either by hand, with a calculator or with your phone.

- a) $0.9 + 4.7$ b) $4.2 + 0.8 + 3.5$ c) $4.1 - 2.7$
- d) $20.1 - 3.6$ e) $12.03 + 96.6 + 9.1$ f) $9.9 - 1.07$
- g) $36 - 0.36$ h) $7.57 + 29.05 + 103.6$ i) $15 + 1.34 + 0.21$
- j) $0.9 + 672.3 + 83.21$

j)	756.41	b)	8.5	c)	1.4
g)	35.64	e)	117.73	f)	8.83
d)	16.41	h)	140.22	i)	16.55
a)	5.6				

Solution

Example 2

- a) 3×0.03 b) 0.651×2.4

Solution

- a) 3×0.03

First count how many digits there are to the **right** of the point. In this case there are 2.

Second, ignore the decimal point and do the multiplication.

$$3 \times 3 = 9.$$

Third, make sure there are the same number of digits to the right of the decimal point as there were at the start.

In this case the answer would be **0.09**

b) 0.651×2.4

First count how many digits there are to the **right** of the point. In this case there are 4. {Three in 0.651 and one in 2.4}.

Second, ignore the decimal point and do the multiplication.

		6	5	1
		X	2	4
	2	6	0	4
1	3	0	2	0
1	5	6	2	4

Third, make sure there are the same number of digits to the right of the decimal point as there were at the start.

In this case the answer would be **1.5624**

Activity 2

Work out the following either by hand, with a calculator or with your phone.

- a) 1.2×0.4 b) 6×1.23 c) 6.03×11
- d) 311×0.12 e) 0.81×16 f) 0.72×48.7

Solution	a) 0.48	b) 7.38	c) 66.33	d) 37.32	e) 12.96	f) 35.064
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Example 3

a) $120 \div 0.004$ b) $1.25 \div 5$

Solution

a) $120 \div 0.004$

First multiply by 1000 to change 0.004 to a whole number.

$$\begin{array}{r} 120 \\ 0.004 \end{array} \quad \begin{array}{c} \text{X1000} \\ \text{---} \\ 4 \end{array} \quad \begin{array}{c} 0 \\ \text{---} \end{array}$$

(Curved arrows indicate multiplying both 120 and 0.004 by 1000 to get 120 000 and 4 respectively.)

Second divide as normal

$$\frac{120\,000}{4} = 30\,000$$

b) $1.25 \div 5$

First if you are dividing by a whole number then there is no need to multiply.

Second divide as normal

$$\frac{1.25}{5} = 0.25$$

Activity 3

Work out the following either by hand, with a calculator or with your phone.

- a) $1.2 \div 0.4$ b) $6 \div 1.25$ c) $6.05 \div 0.11$
- d) $300 \div 0.15$ e) $0.81 \div 1.5$ f) $136.5 \div 45.5$

Solution	a) 3	b) 4.8	c) 55	d) 2000
	e) 0.54	f) 3		