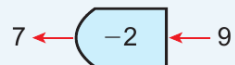
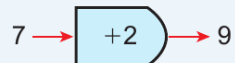


Foundation unit 1

Number

Key point 3

A **function** is a rule. The function +2 adds 2 to a number.



The **inverse** function is -2 because it *reverses* the effect of the function +2.

Key point 4

Finding the **square root** is the inverse of finding the square.
 Finding the **cube root** is the inverse of finding the cube.

Example 4

Use the information that $282 \times 56 = 15792$ to work out the value of

- a 28.2×5.6
- b $15.792 \div 5.6$

a $282 \times 56 = 15792$

Estimate: $28.2 \times 5.6 \approx 30 \times 6 = 180$

$28.2 \times 5.6 = 157.92$

The digits in the questions are the same.

Use the estimate to decide where to put the decimal point.

b $15792 \div 56 = 282$

Write the related division.

Estimate: $15.792 \div 5.6 \approx 20 \div 6 \approx 3$

Estimate the answer.

$15.792 \div 5.6 = 2.82$

Use the estimate to decide where to put the decimal point.

Example 2

Work out 3.4×5.6

Estimate $3 \times 6 = 18$

$$\begin{array}{r} 34 \\ \times 56 \\ \hline 2024 \\ 1700 \\ \hline 1904 \end{array}$$

$3.4 \times 5.6 = 19.04$

Estimate your answer by rounding.

Use a standard method to work out 34×56 .

Use your estimated answer to see where to put the decimal point.

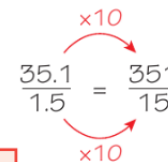
Key point 7

To divide by a decimal, multiply both numbers by a power of 10 (10, 100, ...) until you have a whole number to divide by. Then work out the division.

Example 3

Work out $35.1 \div 1.5$

$35.1 \div 1.5 = \frac{35.1}{1.5}$



1.5 has 1 decimal place, so multiply both numbers by 10.

$15 \overline{)351.0}$

Divide.

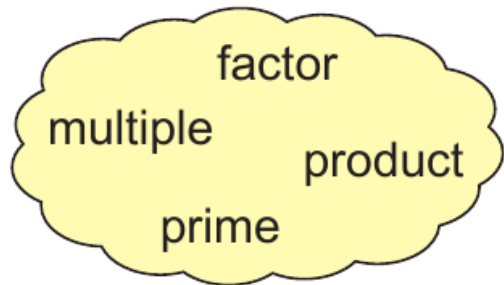
Check: $15 \times 23.4 \approx 20 \times 20 = 400$

Check using an inverse operation and estimation.

Communication hint \approx means 'approximately equal to'.

Key point 11

A prime number has exactly two factors, itself and 1.



Key point 8

You can round numbers to a number of significant figures (s.f.). The 1st significant figure is the one with the highest place value. It is the first non-zero digit in the number, counting from the left.

Key point 12

The **highest common factor (HCF)** of two numbers is the largest number that is a factor of both numbers.

Example 5

Find the HCF of 18 and 24.

1×18	1×24
2×9	2×12
3×6	3×8
	4×6
18: 1, 2, 3, 6, 9, 18	
24: 1, 2, 3, 4, 6, 8, 12, 24	

Work out the factors.

Ring the common factors.

The HCF is 6.

Key point 13

The **lowest common multiple (LCM)** of two numbers is the smallest number that is a multiple of both numbers.

Key point 16

To multiply powers of the same number, add the **indices**.

Communication hint
Indices is the plural of index.

Key point 17

To divide powers of the same number, subtract the indices.

Key point 15

In index notation, the number that is being multiplied by itself is called the **base**. The number written above the base is called the **index** or the **power**. The index tells you the number of times that the base must be multiplied by itself.

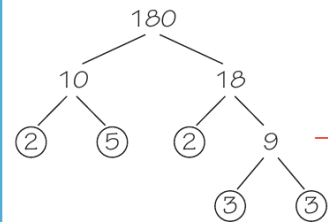
Index or power
Base $\rightarrow 10^{11} = 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$

Exam hint

Show your working by writing down every calculation you need to do. Make sure you clearly state your final answer.

Example 8

Write 180 as a product of its prime factors.



Make a factor tree using pairs of factors.

Circle the prime factors.

Write the factors in order of size, smallest first.

$$180 = 2 \times 2 \times 3 \times 3 \times 5$$

$$180 = 2^2 \times 3^2 \times 5$$

Write their product using index notation.

Example 9

a Express these numbers as products of their prime factors.

- i 36
- ii 60

b Find the highest common factor of 36 and 60.

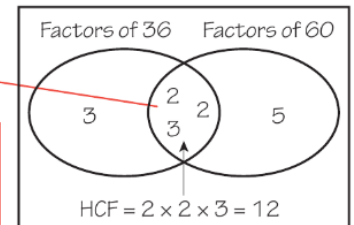
c Find the lowest common multiple of 36 and 60.

a i $36 = 2 \times 2 \times 3 \times 3$

Write the products without powers.

ii $60 = 2 \times 2 \times 3 \times 5$

b Draw a Venn diagram. Put the common factors in the intersection.



$$\text{HCF} = 2 \times 2 \times 3 = 12$$

HCF = product of numbers in the intersection.

Compare the prime factors of 36 and 60

$$36 = (2) \times (2) \times (3) \times 3$$

$$60 = (2) \times (2) \times (3) \times 5$$

c $\text{LCM} = 3 \times 2 \times 2 \times 3 \times 5 = 180$

LCM = product of all the numbers in the diagram.