

1 Algebra – Sequences and Using Algebra

Finding the n^{th} term

In an *arithmetic* sequence the difference between each pair of terms is always the same number.

3, 11, 19, 27, 35, ...

the difference between each pair of terms is 8

each number is called a term

The n^{th} term is always of the form $an + b$ where a is the *difference* between each pair of terms.

The difference here is 8 so $a = 8$.

Put the sequence in a table and write a column for $8n$.

We can see that the term is always 5 less than $8n$ so $b = -5$.

The n^{th} term is $8n - 5$.

n	$8n$	term
1	8	3
2	16	11
3	24	19
4	32	27

Using letters for numbers

Find the expressions you are left with.

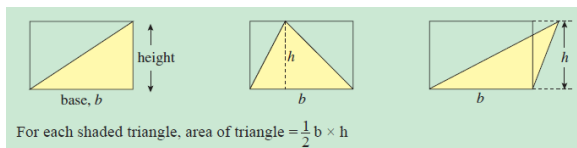
(a) Start with n , multiply by 5 and then add 8.

$$n \rightarrow 5n \rightarrow 5n + 8$$

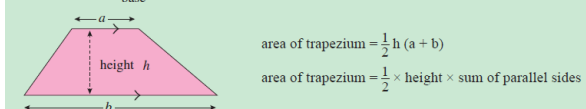
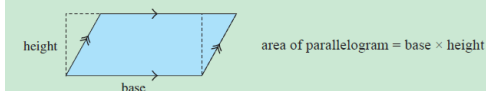
3 Shape – Area and Perimeter

Perimeter: the total length of the line around the outside of the shape.

Area: the amount of space inside a 2D shape.



Parallelogram and trapezium



2 Number – Properties of Number

Prime numbers, factors, multiples and square numbers

A *prime* number is divisible by just two different numbers: by itself and by one. Notice that 1 is *not* a prime number.

Here are some prime numbers: 7, 23, 11

The *factors* of 15 divide into 15 exactly.

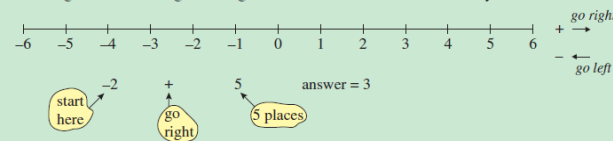
1×15 3×5 The factors of 15 are 1, 3, 5 and 15.

The first four *multiples* of 6 are 6, 12, 18, 24

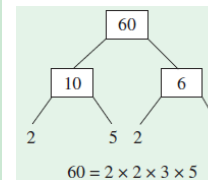
The first four multiples of 11 are 11, 22, 33, 44

The first *square number* is 1 ($1 \times 1 = 1^2$)

For adding and subtracting with negative numbers a number line is very useful.



Prime factor decomposition



4 Handling Data – Graphs and Charts

Pie Charts

A farmer divides his land into three parts. He uses 5 acres for corn, 3 acres for carrots and 2 acres for pigs.

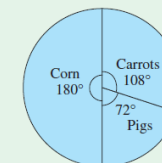
(a) Add the three parts: $5 + 3 + 2 = 10$ acres

(b) 10 acres = 360°
 1 acre = $\frac{360}{10}$
 = 36°

(c) For corn, 5 acres = $5 \times 36^\circ = 180^\circ$

For carrots, 3 acres = $3 \times 36^\circ = 108^\circ$

For pigs, 2 acres = $2 \times 36^\circ = 72^\circ$

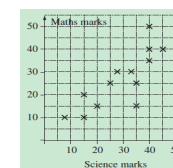


When comparing 2 pie charts, remember you are comparing the proportions not the actual numbers.

Scatter graphs

Here is a scatter graph showing the test marks of some pupils in a maths test and a science test.

We can see a connection: the pupils who got a high mark in science generally got a high mark in maths.



1	2	3	4
197 – 198 151 - 153	27, 28, 31, 33, 34 29 – 30, 39-42	27, 31, 33, 34 39 - 42	427, 428, 453