Rewarding Learning

General Certificate of Secondary Education
November 2021

GCSE Mathematics

HIGHER TIER
ADDITIONAL SUPPORT MATERIALS
(For use in November 2021)

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Conversion from imperial to metric units

5 miles = 8 kilometres

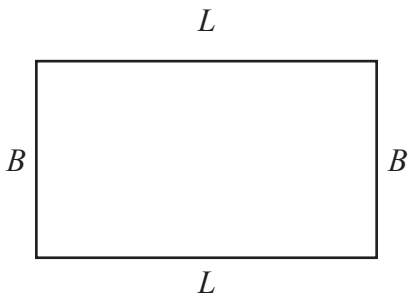
Range

The range of a set of data is the difference between the largest value and the smallest value in the data set.

Mean

The mean of a set of data is the sum of all the data values divided by the number of data values.

Perimeter, Area and Volume



The perimeter of a rectangle is the distance around the outside of the rectangle. It is found by adding the lengths of the 4 sides of the rectangle.

$P = 2L + 2B$ where P is perimeter, L is length and B is breadth.

The area of a rectangle is found by multiplying the length of the rectangle by the breadth.

$A = L \times B$ where A is area, L is length and B is breadth.

The volume of a cuboid is found by multiplying the length by the breadth by the height of the cuboid.

$V = L \times B \times H$ where V is volume, L is length, B is breadth and H is height.

The area of a circle is $A = \pi r^2$ where r is the radius of the circle.

Angles

There are 180° on a straight line.
There are 180° inside a triangle.
An isosceles triangle is a triangle with 2 equal sides and 2 equal angles.
The sum of all the angles inside a polygon is given by $180(n - 2)$ where n is the number of sides in the polygon.

Pie Chart

In a pie chart, the total angle that corresponds to the entire data set is 360°

Probability

The sum of the probabilities of all outcomes equals 1

Average Speed

$$\text{Average Speed} = \frac{\text{Distance}}{\text{Time}}$$

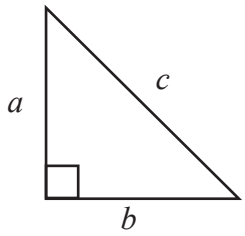
Estimate for the mean of a grouped frequency distribution

Estimated mean = sum of (mid interval values multiplied by their frequency) divided by the sum of all the frequencies.

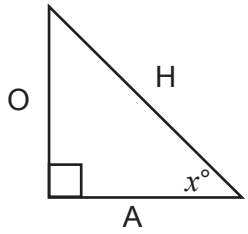
Pythagoras' Theorem

If a, b and c are the sides of a right angled triangle shown below, then

$$a^2 + b^2 = c^2$$



Trigonometric ratios in right angled triangles



$$\sin x° = \frac{\text{O}}{\text{H}} \qquad \cos x° = \frac{\text{A}}{\text{H}} \qquad \tan x° = \frac{\text{O}}{\text{A}}$$

Lines

Parallel lines have the same gradient.
If a straight line has gradient m, then a line which is perpendicular to this line has a gradient $\frac{-1}{m}$

Tangent/Radius property

The tangent to a circle is perpendicular to the radius at the point of contact with the circle.

Frequency density in histograms

$$\text{Frequency density} = \frac{\text{Frequency}}{\text{Class width}}$$