Core 1

Coordinate Geometry

Glossary

Asymptote
A straight line which is approached by a curve, but the curve never reaches the line. Asymptotes are usually marked on graphs as dotted lines.

Chord
A straight line joining two points on the circumference of a circle

Continuous graph
A graph which has no breaks is said to be continuous.

Coordinates
A means of describing a position relative to some fixed point (the origin).
In Cartesian coordinates position is given in terms of two perpendicular directions, x and y.

Discontinuous graph
A graph which has two or more separate branches which do not meet is said to be discontinuous.

Equation of a circle
The equation of a circle with centre (a, b) and radius r is given by

$$(x-a)^2+(y-b)^2=r^2$$

When the centre of the circle is at the origin, the equation simplifies to

$$x^2+y^2=r^2$$

Equation of a straight line
The equation of a straight line with gradient m which intercepts the y-axis at the point $(0, c)$ is given by

$$y=mx+c$$

The equation of a straight line with gradient m which passes through the point (x_1, y_1) is given by

$$y-y_1=m(x-x_1)$$

Core 1

Gradient of a line

The gradient of a line, often denoted by m, is a measure of its slope.

For two points A (x_1, y_1) and B (x_2, y_2) on a straight line, the gradient of the line is given by

$$\text{gradient} = \frac{\text{increase in } y \text{ from A to B}}{\text{increase in } x \text{ from A to B}}$$

$$= \frac{y_2 - y_1}{x_2 - x_1}$$

Intersection of two lines or curves

The point(s) where two lines or curves intersect can be found by solving their equations simultaneously.

If two points of intersection are the same, then the line just touches the curve (i.e. it is a tangent to the curve).

Midpoint of a line

The point halfway between the two ends of a line.

For any two points A (x_1, y_1) and B (x_2, y_2), the midpoint M of the line AB is given by

$$\text{M} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right).$$

Parallel lines

If two lines are parallel, they have the same gradient.

Perpendicular bisector of a line

For a line AB, the perpendicular bisector of AB is perpendicular to AB and passes through the midpoint of AB.

Perpendicular lines

Two perpendicular lines are at right angles to each other.

If two lines with gradients m_1 and m_2 are perpendicular, then $m_1 m_2 = -1$.

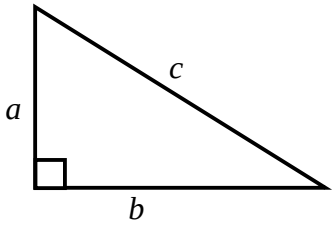
Plotting a graph

This involves marking points on graph paper and joining them up as accurately as possible.

Core 1

Pythagoras' theorem

In a right-angled triangle with side lengths a, b and c (c being the hypoteneuse)



Pythagoras' theorem states that

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

Sketching a graph

This means drawing the right general shape of a graph, usually marking the coordinates of important points such as intersections with the coordinates axes and turning points.

Tangent

A tangent to a curve is a straight line which just touches the curve.
The tangent to a circle at any point is perpendicular to the radius of the circle through that point.