Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

Area of a trapezium = $\frac{1}{2}(a+b)h$

Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:
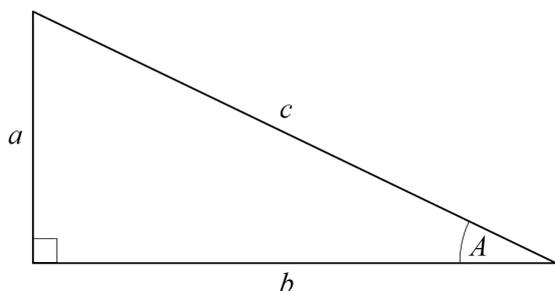
Circumference of a circle = $2\pi r = \pi d$

Area of a circle = πr^2

Quadratic formula

The solution of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

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

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \qquad \cos A = \frac{b}{c} \qquad \tan A = \frac{a}{b}$$

In any triangle ABC where a, b and c are the length of the sides:

sine rule: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

cosine rule: $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \dfrac{1}{2}ab\sin C$

For any angle θ $\qquad \tan\theta = \dfrac{\sin\theta}{\cos\theta}$

and $\quad \sin^2\theta + \cos^2\theta = 1$

Coordinate Geometry

Equation of a straight line passing through (x_1, y_1) with gradient m $\qquad y - y_1 = m(x - x_1)$

The general equation of a circle, centre (a, b), radius r $\qquad (x - a)^2 + (y - b)^2 = r^2$