

# GCSE MATHEMATICS HIGHER TIER

Formulae Sheet

## Insert

#### 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  $\times$  length

Where r is the radius and d is the diameter:

Circumference of a circle =  $2\pi r = \pi d$ 

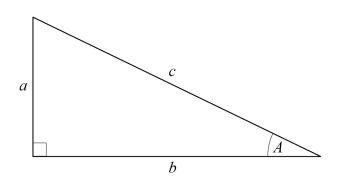
Area of a circle =  $\pi r^2$ 

#### **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:

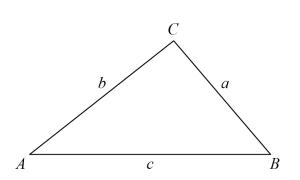
$$\sin A = \frac{a}{c}$$
  $\cos A = \frac{b}{c}$   $\tan A = \frac{a}{b}$ 

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

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

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

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



### **Compound Interest**

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

Total accrued = 
$$P\left(1 + \frac{r}{100}\right)^n$$

#### **Probability**

Where P(A) is the probability of outcome A and P(B) is the probability of outcome B:

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$
  
 $P(A \text{ and } B) = P(A \text{ given } B) P(B)$