# **Higher Tier Formulae Sheet**

## 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 =  $\pi r^2$ 

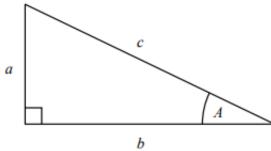
### Quadratic formula

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:

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

In any triangle ABC where a, b and care 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 = 
$$\frac{1}{2} a b \sin C$$

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 Aand P (B) is the probability of outcome B:

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

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

### **END OF EXAM AID**