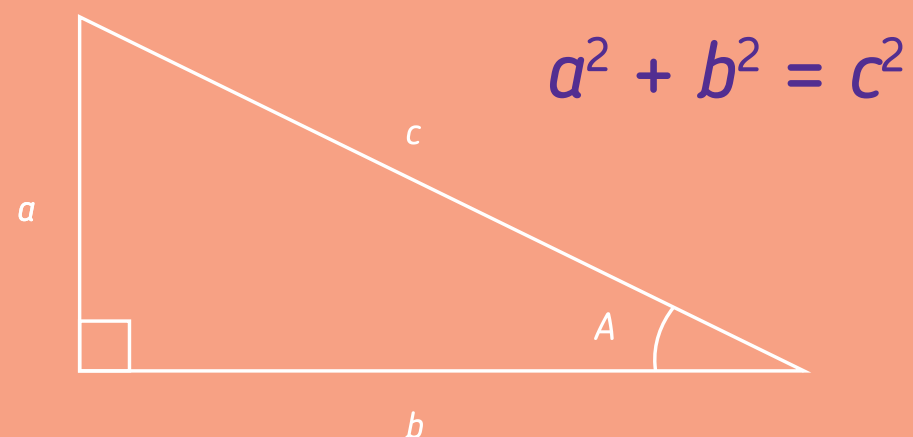


# GCSE Maths

## Formulae you'll need to know

### Pythagoras' theorem

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



### Trigonometry formulae

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

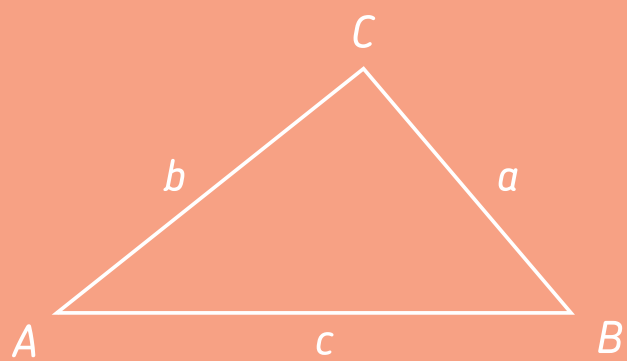
$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$

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

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

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

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



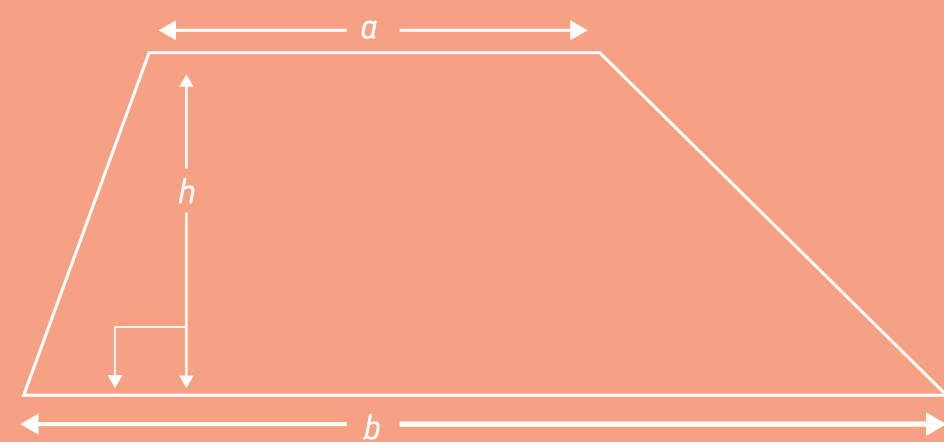
### Circumference and area of a circle

Where  $r$  is the radius and  $d$  is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

### Perimeter, area, surface area and volume formulae



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

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

$$\text{Volume of a prism} = \text{area of cross section} \times \text{length}$$

### Compound interest

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

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

### The quadratic formula

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

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

### Probability

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

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

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