

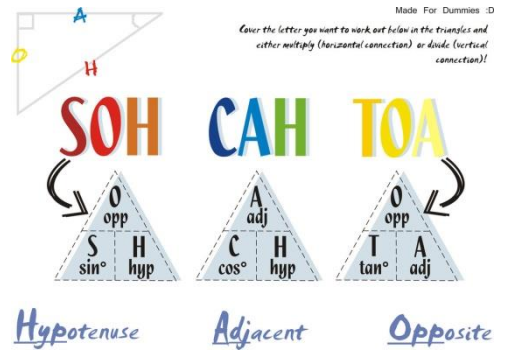
Year 11 Unit 1 Overview

Target grade for tests:

You will learn about:

- Trigonometry exact values
- Trigonometric ratios
- The power 0 and negative powers
- How to solve two linear simultaneous equations algebraically
- Identifying similar shapes and find scale factors
- Expand pairs of brackets
- Factorise quadratic expression

Angle (θ)	$\sin(\theta)$	$\cos(\theta)$	$\tan(\theta)$
0°	0	1	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
45°	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90°	1	0	undefined



Lesson Overview

TRIGONOMETRY

- Appreciate that the ratio of corresponding sides in similar triangles is constant
- Label the sides of a right-angled triangle using a given angle
- Choose an appropriate trigonometric ratio that can be used in a given situation
- Understand that sine, cosine and tangent are functions of an angle
- Establish the exact values of $\sin\theta$ and $\cos\theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$ and 90°
- Establish the exact value of $\tan\theta$ for $\theta = 0^\circ, 30^\circ, 45^\circ$ and 60°
- Know how to select the correct mode on a scientific calculator
- Use a calculator to find the sine, cosine and tangent of an angle
- Know the trigonometric ratios, $\sin\theta = \text{opp/hyp}$, $\cos\theta = \text{adj/hyp}$, $\tan\theta = \text{opp/adj}$
- Set up and solve a trigonometric equation to find a missing side in a right-angled triangle
- Set up and solve a trigonometric equation when the unknown is in the denominator of a fraction
- Set up and solve a trigonometric equation to find a missing angle in a right-angled triangle
- Use trigonometry to solve problems involving bearings
- Use trigonometry to solve problems involving an angle of depression or an angle of elevation

POWERS AND ROOTS

- Know that $a^0 = 1$
- Know that $a^{-n} = 1/a^n$
- Calculate with negative powers
- Use the functionality of a scientific calculator when calculating with roots and powers

SIMULTANEOUS EQUATIONS

- Understand the concept of solving simultaneous equations by substitution
- Decide whether to use elimination or substitution to solve a pair of simultaneous equations
- Solve two linear simultaneous equations in two variables by substitution
- Solve two linear simultaneous equations in two variables by elimination (multiplication of both equations required)
- Derive and solve two simultaneous equations in complex cases
- Interpret the solution to a pair of simultaneous equations

SIMILAR SHAPES

- Use the centre and scale factor to carry out an enlargement of a 2D shape with a fractional scale factor
- Find the scale factor of an enlargement with fractional scale factor
- Find the centre of an enlargement with fractional scale factor
- Make links between similarity and scale factors
- Solve problems involving similarity
- Perform a sequence of transformations on a 2D shape
- Find and describe a single transformation given two congruent 2D shapes
- Solve practical problems involving lengths in similar figures

EXPANDING PAIRS OF BRACKETS AND FACTORISING QUADRATICS

- Multiply two linear expressions of the form $(ax + b)(cx + d)$
- Multiply two linear expressions of the form $(ax \pm b)(cx \pm d)$
- Identify when it is necessary to find two linear expressions to factorise a quadratic expression
- Factorise an expression involving the difference of two squares

Key Words

Refer to

<http://studymaths.co.uk/glossary.php>
for definitions of the key words

Similar
Opposite
Adjacent
Hypotenuse
Trigonometry
Function
Ratio
Sine
Cosine
Tangent
Angle of elevation, angle of depression

Notation

$\sin\theta$ stands for the 'sine of θ '
 \sin^{-1} is the inverse sine function, and not $1 \div \sin$

Power, Root
Index, Indices
Standard form

Unknown
Solve
Simultaneous equations
Substitution
Elimination

Congruent, congruence
Similarity, similar shapes, similar figures
Enlarge, enlargement
Scale factor
Transformation
Rotation
Reflection
Translation

Equivalent
Equation
Expression
Expand
Linear
Quadratic
Difference of two squares
Binomial
Factorise

Research	Note-making	Group work & discussion	Memorisation	Precision & accuracy	Independence	Reflection

