

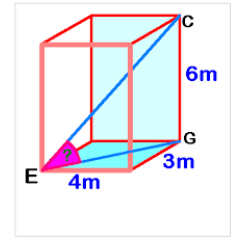
**Year 11 Unit 1 Overview-:**

**Target grade for tests:**

**You will learn about:**

- Simplifying surd expressions
- Pythagoras in 3d
- Trigonometry in 3d
- Sine rule and Cosine rule for non right-angled triangles
- Area of a triangle using  $\frac{1}{2} ab\sin C$
- Graphs of exponential functions
- Graphs of Trigonometric functions

$$\begin{aligned}
 &5\sqrt{2} \times 3\sqrt{2} \\
 &= 5 \times 3 \times \sqrt{2} \times \sqrt{2} \\
 &= 15 \times \sqrt{4} \\
 &= 15 \times \sqrt{4} \times \sqrt{11} \\
 &= 15 \times 2 \times \sqrt{11} \\
 &= \underline{\underline{30\sqrt{11}}}
 \end{aligned}$$



**Key Words**

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

Power, Root  
 Index, Indices  
 Surd  
 Simplify  
 Rationalise

**Notation**  
 $\sqrt{a}$  represents the 'positive square root of', and the bar should be used to enclose contents correctly

Diagonal (Face Diagonal, Space Diagonal)  
 Plane  
 Opposite, Adjacent, Hypotenuse  
 Trigonometry  
 Sine, Cosine, Tangent  
 Angle of elevation, angle of depression

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

Exponential  
 Function, equation  
 Linear, non-linear  
 Quadratic, cubic, reciprocal, exponential  
 Parabola  
 Asymptote  
 Maximum, minimum, period  
 Gradient, y-intercept, x-intercept, root  
 Sketch, plot  
 Arguments

**Lesson Overview**

SURDS

- Know that  $\sqrt{a \times b} = \sqrt{a} \times \sqrt{b}$
- Identify a factor pair where one factor is square
- Use  $\sqrt{a \times b} = \sqrt{a} \times \sqrt{b}$  to simplify a surd
- Multiply two binomials involving surds
- Rationalise the denominator of a surd expression

PYTHAGORAS AND TRIGONOMETRY

- Visualise the diagonals of a cuboid
- Visualise triangle that can be created by joining any three vertices of a three dimensional shape
- Use Pythagoras' theorem to find the length a given diagonal in a cuboid
- Use Pythagoras' theorem to find lengths in three dimensional figures
- Use trigonometry to find the angle between a line and a plane
- Solve practical problems involving lengths and angles in three dimensional figures
- Know the labelling conventions for non-right angled triangles
- Derive the sine rule
- Know the cosine rule
- Identify when the sine (cosine) rule is needed to solve a problem
- Set up and use the sine (cosine) rule to find a missing side in a non-right angled triangle
- Set up and use the sine (cosine) rule to find a missing length in a non-right angled triangle
- Recognise the ambiguous case when using the sine rule
- Solve problems involving bearings

GRAPHS OF EXPONENTIALS AND TRIG FUNCTIONS

- Plot the graph of an exponential function,  $y = k^x$ , for positive values of k
- Understand that trigonometric values can be found for angles of any size
- Plot the graphs of the trigonometric functions,  $y = \sin x$ ,  $y = \cos x$  and  $y = \tan x$
- Know the key features of exponential and trigonometric graphs
- Know the effects of transforming the graph  $y = f(x)$ :  $f(x)$ ,  $f(ax)$ ,  $af(x)$ ,  $f(x) + a$ ,  $f(x + a)$ ,  $y = f(-x)$  and  $y = -f(x)$
- Solve problems involving the transformation of graphs

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