Knowledge Organiser Maths Term 2 Year 10 Higher
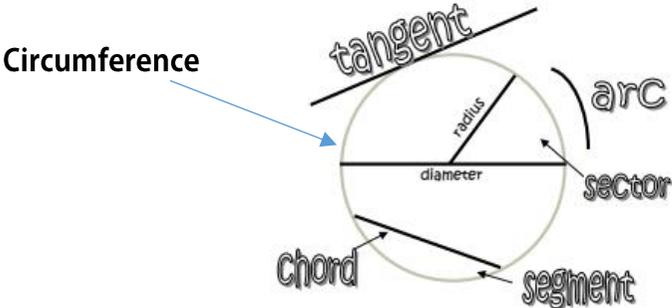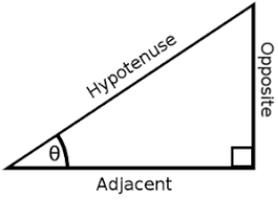
The Numbers in Red are topics that have already been covered in either KS3 or KS4 and are being revisited to help the students to move onto more complicated topics.

The numbers in blue are the GCSE grade of the work being covered

In Green are the Mathsgenie reference which can be used for further revision and questions to try www.mathsgenie.co.uk

Sampling and statistical diagrams 8 Hours	Key Words
- Collecting an un-biased sample 3 - Draw and interpret frequency polygons 3 MG1-2 - Cumulative frequency graphs 6 MG6 - Box-plots 6 MG6 - Histograms and frequency density 7 MG7	**Population**- the whole group from which a sample is taken A sample is "**biased**" if some members of the population are more likely to be included than others. **Frequency table** – arrangement of data in order with recording of how many times each value/group occurred **Mid-point** – middle of the group interval. Can be calculated by adding the end points and dividing by 2 **Cumulative frequency** - accumulated total **Mean, median, mode (modal group)** – averages **Low quartile, upper quartile** – middle of the bottom half and top half of data respectively **Range and interquartile range** – measures of spread **Frequency density** = frequency ÷ group width
Probability 7 Hours	Key Words
- Probability of independent events 6 "And" and "or" rules 6 - Conditional probability 7 - Tree diagrams 5/7 MG5 - Venn diagrams 7 MG5 MG7 - Solving probability equations 8/9 MG8/9	**Probability** – the likelihood of event happening on a scale from 0 to 1 **Mutually exclusive outcomes** – events that can't happen at the same time. Their probability adds to 1 **Independent event**s - if the occurrence of one **event** does not impact the **probability** of the other **event** **Conditional probability** - the **probability** of one event, A, occurring given that another, B, is already known to have occurred.
Circle theorems 6 hours	Key Words
- The angle at the centre is twice the angle at the circumference. 6 MG6 - The angle in a semicircle is a right angle. 6 MG6 - Angles in the same segment are equal.6 MG6 - Opposite angles in a cyclic quadrilateral add to 180°. 6 MG6 - The angle between the chord and the tangent is equal to the angle in the alternate segment. 7 MG6 - Proof of circle theorems 9 MG8/9	**Circumference**
Proportion 4 hours	Key words
Unitary method to solve direct proportion problems 3 MG3	two variables are **proportional** if there is always a **constant** ratio between them **Coefficient of proportionality** - the value that relates the two amounts

• Direct and Inverse proportion 7 MG7	*x* and *y* are directly proportional if the *y/x* is constant. *x* and *y* are inversely proportional if the product *xy* is constant.
Pythagoras and Trigonometry 9 hours • Using Pythagoras to solve problems involving right angle triangles in 2D and 3D 4-7 MG4/7 • Using SOHCAHTOA to solve problems involving right-angled triangles in 2D and 3D 5-8 MG5 • Exact trigonometric values 5-8 MG5 • Sine rule 7 MG7 • Cosine rule 7 MG7 • Finding area of any triangle 7 MG7	Key words **Pythagoras Theorem** - for any right-angled **triangle** the square on the hypotenuse is equal to the sum of the squares on the other two sides $c^2 = a^2 + b^2$ **Trigonometric ratios - sine, cosine and tan** $$\sin(\theta) = \frac{Opp}{Hyp}$$ $$\cos(\theta) = \frac{Adj}{Hyp}$$ $$\tan(\theta) = \frac{Opp}{Adj}$$
Travel Graphs 6 hours • Distance-Time graphs 3 • Velocity-Time graphs 6-9 MG8/9 • Estimating area under a curve 9 MG8/9	Key words **Gradient** of a graph is a measure of steepness. To work out gradient choose two any points on a line, draw a right angled triangle with line as a hypotenuse, find vertical and horizontal lengths of a triangle using scale on the axis, divide vertical length by horizontal **Velocity** is a measure of how fast something moves in a particular direction. It is a gradient of distance-time graph **Acceleration** is the rate at which velocity (speed) is changing. It is a gradient of velocity-time graph