Knowledge Mat: Year 11

Key Knowledge for
Year 11 in Maths

- Know exact trig ratios for angles between 0^0 and 360^0.

- Solving quadratic equations (differentiated to include completing the square and using the quadratic formula)

- Multiply out two brackets (differentiated to 3 brackets)

- Simultaneous linear equations (differentiated to include quadratic simultaneous equations)

- Solve inequalities (differentiated to include quadratic inequalities and representing on a graph)

- Substitution into algebraic expressions (differentiated to include functions, composite functions and iteration)

- Angles in polygons (differentiated to include circle theorems and proof)

- Understand links between different shapes of graphs and their equations (differentiated to include equations of circles, Equations of trig functions and their respective graphs, exponential equations, transformations of graphs)

- Interpret information from real-life graphs such as Velocity time graphs (differentiated to include rate of change, estimate of area underneath the curve)

- Vector geometry

Wider Experiences / Try To Do…

- Intermediate Maths challenge

- Chess club

- Trips – number systems and ratio

- Mathswatch

- PIXL Maths app

The big questions:

- Can you recall and apply important mathematical facts and techniques to problems rapidly?

- How much will it cost you to pass your driving test?

- When is it better to buy 3 for 2 or Buy One Get One free?

- Is Fairtrade fair? Investigate prices online
- "the top 1 per cent of earners in this country are paying 28 per cent of the tax burden" – "the highest percentage ever
  Is this fair? Is it in proportion with other earners? Develop mathematical thinking so you can critique data.

- What equations must you plot to make a square?

- Can you do the four operations on algebraic fractions?

Vocabulary

Word	Meaning
Analyse	Examine something in detail
Assess	Make an informed judgement.
Comment	Present a written informed opinion.
Complete	Finish a task by adding to given information.
Conversions	Changing from one form to another – eg converting from miles to kilometres
Data	A collection facts or numbers
Describe	Present a written account
Estimate	Give an approximate value.
Expand	Multiply parts of an expression to remove any brackets
Factor	A number or algebraic expression that divides exactly into another eg 4 is a factor of 12
Factorise	Show an expression as two or more factors
HCF	Highest Common Factor – the highest number which is a factor of two or more numbers or expressions
LCM	Lowest Common Multiple – the lowest number which is a multiple of two or more numbers or expressions
Measure	Use a mathematical instrument, such as a ruler or protractor, to establish the size of a length or angle.
Multiple	A number which is in that particular times table. Eg 12 is a multiple of 4
Parallel	2 or more lines which remain the same distance apart along the whole length
Plot	Mark accurately on a graph.
Prime Number	A number with only 2 factors (itself and 1). Eg 7 is a prime number because the only factors of 7 are 1 and 7
Proportion	When 2 numbers or values or linked – Direct proportion as one increases, the other increases; Indirect proportion as one increases, the other decreases
Prove	Demonstrate something is true based on mathematical rules
Rotate	Turn around a fixed point.
Sampling	Selecting some numbers in a set of data
Show	Provide a structured explanation to reach a conclusion
Simplify	Collect and combine terms of an expression to make the expression shorter
Simplify fully	Collect and combine terms of an expression to make the expression as short as it will go
Solve	To work out the answer
Term	A single mathematical statement made up of letters and/or numbers eg 4**x**
Variable	An unknown number represented by a letter
Work out	Perform one or a set of steps or calculations to arrive at an answer