Subject	Y12 Core Knowledge – Autumn/Spring/Summer term	How to support students' learning
Maths	**Autumn Term** **Polynomials -** 1. Use factor theorem to solve problems. **Differentiation -** 2. Understand how to find the second derivative. **Coordinate Geometry -** 3. Show a line is a tangent to a circle. **Integration -** 4. Find an equation given the gradient function and a point. **Polynomials -** 5. Use factor theorem to factorise and sketch. **Differentiation -** 6. Find stationary points and determine their nature. **Coordinate Geometry -** 7. Understand and use the equation of a circle, centre, radius, intersection of a circle and a line, and perpendicular line. **Differentiation -** 8. Demonstrate how to differentiate with negative/fractional powers. 9. Differentiate to find tangents of curves. **Spring/Summer Term** **Binomial Expansion -** 10. Use binomial expansion to find a particular term. **Polynomials -** 11. Use the factor theorem to find a missing coefficient. 12. Find all the linear factors of a cubic expression. **Equations & Inequalities -** 13. Find a linear graph that can be used to solve a quadratic equation graphically by finding the intersection of another given quadratic and the linear graph that's to be found.	• If students need support with their learning, almost everything they need can be found on Integral Maths. They have a unique login for this and are regularly set homework tasks. There is a wealth of videos and resources which they can use to independently recap any topics in which they've struggled. • For past exam papers; https://www.physicsandmathstutor.com and www.mathsgenie.co.uk offers a range of past papers, mark schemes and model answers. If students need support or guidance with any of this, their class teacher can direct them to the appropriate content.

	14. Use a quadratic graph and a linear graph to solve another quadratic equation graphically. 15. Shade a region that satisfies 4 inequalities. **Trigonometry -** 16. Solve a basic trigonometric equation and find all solutions in a given range. 17. Solve a trigonometric equation using the Pythagorean identity and find all solutions in a given range. **Integration -** 18. Determine the equation of a curve given the gradient function and a point. 19. Find an expression for the value of an integral in terms of a given variable. **Exponentials & Logarithms -** 20. Substitute into an exponential model to find the value of a population at a given time. 21. Solve an exponential equation to find the time at which the population reaches a certain value. 22. Show that, using a logarithmic model, a graph can be drawn as a straight line. 23. Plot given points and draw a line of best fit. 24. Use a line of best fit to find the gradient and intercept and then use the logarithmic equation to find missing variables for the logarithmic model. **Quadratic Functions -** 25. Use the discriminant to find the range of values for a constant for which the simultaneous equations have real solutions. **Equations & Inequalities -** 26. Give a geometrical interpretation of a particular value of a variable for a pair of simultaneous equations.	