KS4 Year 11 Group D

Subject: Mathematics

The mathematics department aim to develop the full potential of every student in the subject. It is our aim to ensure that every pupil experiences success and enjoyment in the subject, whether it be equipping them with sufficient mathematical skills for everyday life or developing problem solving and reasoning skills to take them beyond GCSE.

The scheme of learning is divided into units of study consisting of interlinking skills and topics that build on prior learning. Throughout the year students will complete multi-choice quizzes, homework, 'common homework tasks' and assessments. The common homework tasks will be completed by all students following this scheme of learning. The assessments provide opportunities for students to demonstrate their ability to recall information, methods of calculation and skills studied in previous units of work, and apply their problem solving skills to a variety of contextual problems.

Year 11 – Group D

		I will learn to	How I will be assessed
Autumn Term	Unit 1	• *Solve quadratic equations by factorising (including where coefficient of x2 is greater than 1) and using the quadratic formula • Simplify and manipulate algebraic expressions involving algebraic fractions • Solve equations involving algebraic fractions	Multi-choice Quiz Homework
	Unit 2	• *Solve quadratic equations by completing the square • Deduce turning points by completing the square • Recognise, sketch and interpret graphs of exponential functions, trigonometric functions y=sinx, y=cosx and y=tanx with angles of any size in degrees • Transform the graph of any function f(x) including: f(x) + a, f(x + b), -f(x) and f(-x) where a and b are integers • Recognise transformations of functions and be able to write down the function of a transformation given the original function	Multi-choice Quiz Homework **Mock exams**
Spring Term	Unit 3	• *Solve two linear simultaneous equations in two variables algebraically and graphically • Solve two simultaneous equations (one linear, one quadratic) algebraically (include examples where one equation is the equation of a circle) • *Solve quadratic equations graphically • *Identify and interpret roots, intercepts and turning points of quadratic functions graphically • Solve two simultaneous equations (one linear, one quadratic) graphically • *Solve linear inequalities in one or two variables; represent the solution set on a number line, using set notation and on a graph • Solve quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph	Multi-choice Quiz Homework Practice exam papers

	Unit 4	• Interpret the meaning of a gradient as a rate of change; understand the difference between positive and negative gradients as rates of change • Estimate the gradient at a point on a curve by drawing a tangent at that point and working out the gradient and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts • Understand that the gradient of a speed/velocity graph represents acceleration and the gradient of a distance/time graph represents speed • Understand that the rate of change at a particular instant in time is represented by the gradient of the tangent of the curve at that point. • Calculate or estimate the area under a graph (using trapezia, triangles and rectangles for curves) and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts	Multi-choice Quiz Homework **Mock exams**
	Unit 5	• Recognise and use the equation of a circle with centre at the origin • Find the gradient of a line that is perpendicular to a given line and hence the equation of a line perpendicular to a given line and passing through a given point • *Show that 2 lines are perpendicular • Use the fact that the angle between a tangent and radius is 90o to work out the gradient of a tangent and hence the equation of a tangent at a given point	Multi-choice Quiz Homework Practice exam papers
	Unit 6	• *understand that the tangent at any point on a circle is perpendicular to the radius at that point • *understand and use the fact that tangents from an external point are equal in length • use congruent triangles to explain why the perpendicular from the centre to a chord bisects the chord • understand that inscribed regular polygons can be constructed by equal division of a circle • prove and *use the fact that the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference • prove and *use the fact that the angle subtended at the circumference by a semicircle is a right angle • prove and *use the fact that angles in the same segment are equal • prove and *use the fact that opposite angles of a cyclic quadrilateral sum to 180° • prove and *use the alternate segment theorem.	Multi-choice Quiz Homework Practice exam papers
Summer Term		Follow up from Mock exams and Revision for GCSE exams	GCSE exam

*Skill has previously been covered. This time more emphasis will be given to proof and problem solving.

How you can support your child's progress in mathematics:

- Encourage independence in repeated practice of unfamiliar topics using vle.mathswatch.co.uk/vle
- Provide real life opportunities to challenge your child's mathematical knowledge and skills. Examples could include; calculating change from a bill, estimating the cost of a restaurant bill, working out the best buy when shopping, working out the cost of a home improvement or the amount of supplies for a home improvement.
- Encourage the use of appropriate mathematics websites such as Nrich or Mathsgenie for 'rich' tasks and exam style questions.
- Encourage your child to attend revision sessions at school
- Encourage your child to follow the revision timetable for mathematics