Lode Heath School

Mathematics Department

Year 11 Higher
Autumn Term

Assignment Title	Unit 1: Equations and graphs	Set	Autumn

Summary of Unit 1	Key Words
Simplify and manipulate algebraic expressions. Draw graphs of algebraic functions. Recognise and describe features of cubic and reciprocal graphs.	Solve, simultaneous equations, graphically, Inequalities, graphs, Interpret, quadratic, functions.

Prior Knowledge:

1. Simplify these surds a) $\sqrt{27}$ b) $\sqrt{200}$ c) $\sqrt{20}$

2. Work out the value of y when x=0 a) $y = 2x - 7$ b) $2y - 3x = 12$ c) $y = x^2 - 2x + 7$

3. Solve these inequalities: a) $x + 4 \geq 7$ b) $2x - 5 > 9$ c) $3x - 2 \leq 18 - x$

4. Expand and simplify a) $(x + 3)(x + 7)$ b) $(2x + 3)(x + 6)$ c) $(x - 4)^2$

5. Factorise a) $x^2 + 7x + 10$ b) $x^2 + 2x - 15$ c) $x^2 - 1$

LEARNING JOURNEY

Level	Task Description
6-7	**1.1 Solving simultaneous equations graphically** Solve simultaneous equations graphically.
5	**1.2 Representing inequalities graphically** Represent inequalities on graphs. Interpret graphs of inequalities.
6	**1.3 Graphs of quadratic functions** Recognise and draw quadratic functions.
6	**1.4 Solving quadratic equations graphically** Find approximate solutions to quadratic equations graphically. Solve quadratic equations using an iterative process.
7	**1.5 Graphs of cubic functions** Expand 3 brackets. Find the roots of cubic equations. Sketch graphs of cubic functions. Solve cubic equations using an iterative process.

Assignment Title	Unit 2: Circle Theorems	Set	Autumn

Summary of Unit 2	Key Words
Identify properties of circles. Understand, prove and use circle theorems.	Radius, centre, tangent, circumference, diameter, gradient, perpendicular, reciprocal, coordinate, equation, substitution, chord, triangle, isosceles, angles, degrees, cyclic quadrilateral, alternate, segment, semicircle, arc, theorem.

Prior Knowledge:

1) Describe the following parts of a circle:

a) Tangent:

b) Radius:

c) Chord:

d) Segment:

2) One angle in an isosceles triangle is 50°. What could the other two be?

3) What is the gradient and y-intercept of the following line? $y = 2x + 5$

LEARNING JOURNEY

Level	Task Description
6-8	**2.1 Radii and chords** Solve problems involving angles, triangles and circles. Understand and use facts about chords and their distance from the centre of a circle. Solve problems involving chords and radii.
6-8	**2.2 Tangents** Understand and use facts about tangents at a point and from a point. Give reasons for angle and length calculations involving tangents.
6-8	**2.3 Angles in circles 1** Understand, prove and use facts about angles subtended at the centre and the circumference of circles. Understand, prove and use facts about the angle in a semicircle being a right angle. Find missing angles using these theorems and give reasons for answers.
6-8	**2.4 Angles in circles 2** Understand, prove and use facts about angles subtended at the circumference of a circle. Understand, prove and use facts about cyclic quadrilaterals. Prove the alternate segment theorem.
7-8	**2.5 Applying circle theorems** Solve angle problems using circle theorems. Give reasons for angle sizes using mathematical language. Find the equation of the tangent to a circle at a given point.