Lode Heath School

Mathematics Department

Year 11 Higher
Spring Term

Assignment Title	Unit 3: Vectors and geometric proof	Set	Spring

Summary of Unit 3	Key Words
Work with vectors; understand them, calculate with them, solve problems with them and use them for proofs.	Vector, direction, magnitude, scalar, multiple, parallel, collinear, proof, ratio, column vector.

Prior Knowledge:

1) Write down the vector for the translation of 3 right and 2 down.

2) Find the length of the hypotenuse: 3m

4m

3) Split 45m into the ratio 3:2

4) Name three properties of a parallelogram

LEARNING JOURNEY

Level	Task Description
6-7	**3.1 Vectors and vector notation** Understand and use vector notation. Work out the magnitude of a vector.
6-7	**3.2 Vector arithmetic** Calculate using vectors and represent the solutions graphically. Calculate the resultant of two vectors.
6-8	**3.3 More vector arithmetic** Solve problems using vectors. Use the resultant of two vectors to solve vector problems.
6-8	**3.4 Parallel vectors and collinear points** Express points as position vectors. Prove lines are parallel. Prove points are collinear.
6-8	**3.5 Solving geometric problems** Solve geometric problems in two dimensions using vector methods. Apply vector methods for simple geometric proofs.

Assignment Title	Unit 4: More algebra	Set	Spring

Summary of Unit 4	Key Words
Work with algebraic fractions; simplify, add and subtract, multiply and divide, solve equations. Rearrange formulae. Use surds. Use function notations.	Rationalise, denominator, surd, rational, irrational, fraction, equation, rearrange, subject, proof, function notation, inverse, evaluate.

Check in: What do you know already?

1) Find the lowest common multiple of 15 and 10.

2) Factorise: a) $12x^2y + 9xy$ b) $x^2 + 7x + 12$

3) Find a) $\frac{2}{5}+\frac{1}{4}$ b) $\frac{3}{8} \times \frac{2}{9}$

4) Solve a) $4x + 7 = 31$ b) $5x + 3 = 3x + 15$

LEARNING JOURNEY

Level	Task Description
6-7	**4.1 Rearranging formulae** Change the subject of a formula where the power of the subject appears. Change the subject of a formula where the subject appears twice.
6-7	**4.2 Algebraic fractions** Add and subtract algebraic fractions. Multiply and divide algebraic fractions. Change the subject of a formula involving fractions where all the variables are in the denominators.
6-7	**4.3 Simplifying algebraic fractions** Simplify algebraic fractions.
6-8	**4.4 More algebraic fractions** Add and subtract more complex algebraic fractions. Multiply and divide more complex algebraic fractions.
6-8	**4.5 Surds** Simplify expressions involving surds. Expand expressions involving surds. Rationalise the denominator of a fraction.
7-8	**4.6 Solving algebraic fraction equations** Solve equations that involve algebraic fractions.
8	**4.7 Functions** Use function notation. Find composite functions. Find inverse functions.
6-8	**4.8 Proof** Prove a result using algebra.

Assignment Title	Unit 5: Proportion and graphs	Set	Spring

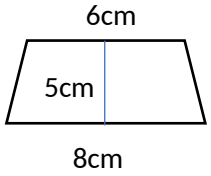
Summary of Unit 5	Key Words
Solve problems using direct and inverse proportion. Recognise types of graphs and calculate gradients and areas under non-linear graphs. Transform graphs of functions.	Vector, direction, magnitude, scalar, multiple, parallel, collinear, proof, ratio, column vector.

Prior Knowledge:

1) A is directly proportional to B. If A = 6 when b = 24, what is A if B = 40?

2) C is inversely proportional to D. If C is 6 when D is 10, what is D when C is 5?

3) What is the area of the trapezium on the right?



4) A and B lie on a straight line. A is at (3,5) and B is at (7,17). What is the gradient of the line?

LEARNING JOURNEY

Level	Task Description
7-8	**5.1 Direct proportion** Write and use equations to solve problems involving direct proportion.
7-8	**5.2 More direct proportion** Write and use equations to solve problems involving direct proportion. Solve problems involving square and cubic proportionality.
7-8	**5.3 Inverse proportion** Write and use equations to solve problems involving inverse proportion. Use and recognise graphs showing inverse proportion.
7-8	**5.4 Exponential functions** Recognise graphs of exponential functions. Sketch graphs of exponential functions.
8	**5.5 Non-linear graphs** Calculate the gradient of a tangent at a point. Estimate the area under a non-linear graph.
6-8	**5.6 Translating graphs of functions** Understand the relationship between translating a graph and the change in its function notation.
6-8	**5.7 Reflecting and stretching graphs of functions** Understand the relationship between translating a graph and the change in its function notation. Understand the relationship between translating a graph and the change in its function notation.