

Year 10 Mathematics Learning Journey (H)

Can I demonstrate competence in the various applications of equations, inequalities and probability? **(Further development of the curriculum from year 9 Autumn 1)**

- Solve inequalities and show the solution on a number line and using set notation; rearrange and solve quadratic equations; use the quadratic formula to solve a quadratic equation; solve quadratic equations by completing the square; solve various types of simultaneous equations including real-life situations; solve simultaneous equations with one quadratic equation.
- Use the product rule for finding the number of outcomes for two or more events; use two-way tables and sample space diagrams to solve probability problems; identify & find the probabilities of mutually exclusive outcomes and events; estimate the expected results for experimental and theoretical probabilities & compare to decide if a game is fair; draw and use frequency trees; calculate probabilities of independent events; use probability tree diagrams to solve problems; decide if two events are independent; draw and use tree diagrams to solve conditional probability problems; use Venn diagrams to solve conditional probability problems.

Start of the Year

Can I demonstrate mastery in collecting, presenting and analysing data?

(Further development of the curriculum from year 9 Autumn 2)

- Understand the assumptions made when using a sample to predict results for a population; use the Petersen capture-recapture method; draw and interpret cumulative frequency tables and graphs; work out the median, quartiles and interquartile range from a cumulative frequency graph; find the quartiles and the interquartile range from stem-and-leaf diagrams; draw and interpret box plots; understand frequency density, draw and interpret Histograms; solve problems by comparing distributions.

Am I able to show competence in equations, graphs and circle theorems?

Further development of the curriculum from year 9 Autumn 1 & Spring 2)

- Solve simultaneous equations graphically; represent inequalities on graphs; interpret graphs of inequalities, find roots of equations, sketch quadratic graphs & find roots of quadratic equations; solve quadratic inequalities; expand triple brackets; find the roots of cubic equations; sketch graphs of cubic equations; solve quadratic and cubic equations using an iterative process.
- 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; understand and use facts about tangents at a point and from a point; solve angle and length problems involving circles and tangents; 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; 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; solve angle problems using circle theorems; find the equation of the tangent to a circle at a given point.

Can I demonstrate competence in multiplicative reasoning, similarity and congruence?.

(Further development of the curriculum from year 9 Autumn & Summer)

- Find an amount after repeated percentage changes; solve growth and decay problems; solve problems using an iterative process; calculate rates; convert between metric speed measures; use a formula to calculate speed and acceleration; solve problems involving compound measures; use relationships involving ratio; use direct and indirect proportion.
- Show that two triangles are congruent; know the conditions of congruence; prove shapes are congruent; solve problems involving congruence; use geometric sketching to help solve congruency problems; use the ratio of corresponding sides to work out scale factors; find missing lengths on similar shapes; use geometric sketching to help solve similarity problems; use the links between scale factors for length, area and volume to solve problems.

Can I demonstrate mastery in trigonometry? **(Further development of the curriculum from year 9 Spring 1)**

- Understand and use upper and lower bounds in calculations, especially involving trigonometry; understand how to find the sine, cosine and tan of any angle; know the graph of the sine, cosine and tan function and use it to solve equations; find the area of a triangle and a segment of a circle; use the sine & cosine rule to solve 2D problems; solve bearings problems using trigonometry; use Pythagoras' theorem in 3D; use trigonometry in 3D; recognise how changes in a function affect trigonometric graphs.

Am I able to demonstrate competence in algebraic manipulations in various forms??

(Further development of the curriculum from year 9 Autumn 1)

- Change the subject of a formula where the power or root of the subject appears; change the subject of a formula where the subject appears twice; 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; simplify algebraic fractions; add and subtract more complex algebraic fractions; multiply and divide more complex algebraic fractions; prove a result using algebra; simplify expressions involving surds; expand expressions involving surds; rationalise the denominator of a fraction; solve equations that involve algebraic fractions; use function notation; find composite and inverse functions.