National 5 Course

Algebraic Operations

- Expanding Brackets
  - $(ax + b)(cx + d)$
  - $(ax + b)(cx^2 + dx + e)$
- Factorising
  - Common factor
  - Difference of two squares
  - Trinomials with unitary and non-unitary coefficients of x^2
- Write quadratic expressions with unitary coefficient of x^2 in completed square form

Linear Relationships

- Find the equation of a straight line using $y - b = m(x - a)$
- Find the coordinates of points where straight lines intersect both axes

Statistics

- Calculate the standard deviation of a data sample
- Median and semi-interquartile revision
- Compare the consistency of data referencing standard deviation and SIQR
- Scatter graphs and equation of line of best fit

Changing the Subject of a Formula

- Change the subject of a linear equation
- Change the subject of an equation involving a square or square root term

Simultaneous Equations

- Construct linear equations from text involving two variables
- Solve simultaneous equations graphically
- Solve simultaneous equations algebraically

Triangle Trigonometry

- Use the sine rule to find missing sides and angles
- Use the cosine rule to find missing sides and angles
- Find the area of a triangle using $A_{tri} = \frac{1}{2} a\, b \sin C$
- Solve trigonometry problems in context including problems involving bearings

Surds

- Simplify surds by identifying squared term factors
- Perform calculations involving surds (all four operations)
- Rationalise the denominator

Indices

- Multiply and divide terms of the form ax^b where a and b are rational numbers
- Understand and apply the rule that $(a^m)^n = a^{mn}$
- Express terms of the form ax^{-b} in the form $\dfrac{a}{x^b}$
- Understand that $x^{\frac{m}{n}} = \sqrt[n]{x^m}$ and apply this knowledge to calculations

Algebraic Fractions

- Reduce an algebraic fraction to its simplest form
- Apply one of the four operations to algebraic fractions

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Vectors

- Adding or subtracting two-dimensional vectors using directed line segments
- Determining coordinates of a point from a diagram representing a 3D object
- Adding or subtracting two-dimensional or three-dimensional vectors using components
- Express a journey as a difference of position vectors i.e. $\overline{AB} = b - a$
- Magnitude of a vector (link to Pythagoras)

Function Notation

- Understand and use functional notation in the following ways
  - Evaluate f(2) for various functions
  - Solve f(a) = b where a and b are rational numbers

Shape Properties

- Use shape properties to find interior and exterior angles in polygons

Equations and Inequations with Fractions

- Solve equations and inequations with fractions

Quadratic Equations

- Factorise to solve quadratic equations
- Apply quadratic formula to solve quadratic equations
- Understand relationship between discriminant and roots
- Apply knowledge graphically

Quadratic Relationships

- Recognise and determine the equation of a quadratic function from its graph
  - $y = kx^2$
  - $y = (x + p)^2 + q$
- Sketch a quadratic function
  - $y = (x - m)(x - n)$
  - $y = (x + p)^2 + q$
- Identify features of a quadratic function
  - Nature
  - Turning point
  - Equation of axis of symmetry

Trigonometric Graphs

- Know how to sketch basic graphs
  - $y = \sin x$
  - $y = \cos x$
  - $y = \tan x$
- Understand features of trigonometric graphs including
  - Amplitude
  - Vertical translation
  - Multiple angles
  - Phase angles

Trigonometric equations

- Work with trigonometric relationships in degrees
  - Evaluate sine, cosine and tangent of angles 0 – 360

- o Understand the concept of related angles
- o Solve basic equations
- o Apply trigonometric identities to simplify expressions

Please note that Vectors and Simiarity are not included in then course for session 22/23 due to COVID mitigations.