

Stage 6: List of Topics Covered this Year

Angle and Position

- use circle theorems to calculate angles in circles
- use trigonometry in situations including those involving bearings, and angles of elevation and depression
- use coordinates in 3 dimensions

Area and Volume

- find surface areas of prisms, cylinders and spheres
- calculate sector area
- distinguish between formulae for length, area and volume, and check that a formula is dimensionally correct
- calculate volumes of spheres, hemispheres, cones and pyramids

Calculate using mental and written methods

- select, choose and justify selection of method, including when to use a calculator

Collect and record data

- specify and test hypotheses, taking account of the limitations of the data
- consider the effect of sample size and other factors that affect the reliability of conclusions drawn
- sample systematically



Construction

- draw accurate plans and elevations of any 3D solid to an appropriate scale
- select and apply loci to solve problems given more than two conditions

Equations and Inequalities

- solve linear simultaneous equations
- solve a quadratic equation where the coefficient of x^2 is 1 by factorising
- examine rates of change, *e.g. vases and water*
- recognise and define limitations on accuracy of measurements in calculations involving addition and subtraction

Expressions and formulae

- show and use indices rules where the power is a negative whole number or a proper fraction
- recognise situations that require substitution, *e.g. drawing graphs* 
- factorise quadratic expressions where the coefficient of x^2 is 1, including the difference of two squares 
- rearrange formulae involving brackets and powers

Fractions, decimals, percentages and ratio

- use and understand the idea of reverse percentage to find an original quantity
- use powers to calculate the outcome of a given repeated proportional change
- use direct and inverse proportion

Functions and Graphs

- state the equation of parallel lines given facts or a graph
- generate and plot points for quadratic and cubic functions
- generate and plot points for simple reciprocal graphs
- generate, plot points and use exponential graphs of the function $y = k^x$
- solve linear simultaneous equations graphically
- identify key features of, and distinguish between, graphs of linear, quadratic, cubic and reciprocal functions
- construct graphs and define regions to show 2 or more inequalities

Length, Weight/Mass and Capacity

- find the perimeter of a sector
 - find the arc length
 - use trigonometry to find the length of a side in a right angled triangle, *e.g. finding the height of an isosceles triangle*
 - understand and use a variety of compound measures that involve converting between units
 - recognise and define limitations on accuracy of measurements in calculations involving addition and subtraction
 - construct and extrapolate from conversion graphs

Money

- use and understand efficient methods of calculating compound interest
- make comparisons between financial products that involve long-term borrowing and investments

Movement

- reflect shapes in the lines $y = x$ and $y = -x$
- enlarge a shape from a centre where the scale factor is a fraction?
- find the centre of enlargement
- recognise and describe transformations

Using number facts and relationships

- identify when to use standard form

Present and Analyse data

- construct and interpret graphs and diagrams (including pie charts) to represent discrete or continuous data, with the learner choosing the most appropriate representation, including cumulative frequency curves and boxplots
- use a scatter diagram to make predictions about the data from a line of best fit that passes through the mean
- use a cumulative frequency curve to estimate the median, quartiles and inter-quartile range
- use the inter-quartile range to compare distributions
- compare sets of data and their distributions, using appropriate methods, including those that involve describing central tendency, dispersion, correlation
- recognise and use the most appropriate data to compare distributions

Using Data Skills: Probability

- understand dependent and independent outcomes
- use relative frequency to test a given probability $\frac{1}{2}$
- complete a tree diagram for two or more independent events
- use tree diagrams to calculate the probability of combined events

Number Sequences

- express the n th term rules algebraically, *e.g.* n^2 , $n^2 + 1$, $n^2 + 3$, $n^2 - 3$, n^3

Shape

- find the area of a 2D shape given the area of a similar shape and a pair of corresponding sides
- find the volume of a similar shape given the volume of a similar shape and a pair of corresponding edges