

Year 10 Revision List – Accelerator

Number

- **Number properties;** including multiples, factors, primes, squares, cubes, roots, prime factor decomposition, highest common factor and lowest common multiple.
- **Percentages,** including percentage of a quantity, percentage increase/decrease, percentage multipliers, reverse percentages, percentage profit & loss, and compound interest.
- **Ratio and proportion;** including equivalent ratios, sharing in a ratio, the unitary method and solving proportionality problems.
- **Rounding and approximating;** including rounding to decimal places, rounding to significant figures and estimating. Use inequality notation to specify error intervals due to rounding.
- **Multiplication and division;** including long multiplication and division of both integers and decimals, and understanding the effects of multiplying and dividing by numbers between 0 and 1.
- **Negative numbers;** including adding, subtracting, multiplying and dividing negative numbers.
- **Fractions;** including fraction of a quantity, comparing fractions, adding, subtracting, multiplying, dividing fractions and reciprocals.
- **Decimals;** including, adding, subtracting, multiplying, dividing and converting between fractions, decimals and percentages. Converting recurring decimals to fractions.
- **Calculations;** including how to use a calculator to carry out complex calculations.
- **Standard Form;** including writing both large and small numbers in standard form, being able to perform standard form calculations both with and without a calculator.
- **Ratio;** simplifying ratios and converting between ratios, fractions and percentages. Sharing in a given ratio. Solving problems using the unitary method. Problem solving using ratio.
- **Accuracy;** find and calculate using lower and upper bound. Calculate absolute and percentage error.
- **Proportionality;** set up equations and perform calculations for direct and inverse proportionality. Recognise and interpret proportionality graphs.
- **Surds;** Writing exact answers using n and surds. Understand the difference between rational and irrational numbers. Simplify, manipulate surds and rationalise their denominator.

Algebra

- **Algebraic expressions;** including collecting like terms and simplifying expressions, expanding single brackets, expanding double brackets, expanding triple brackets, factorising into a single bracket, factorising quadratic expressions and algebraic substitution.
- **Solving equations;** including solving linear equations with unknowns on one side, linear equations with unknowns on both sides, linear equations with brackets, linear equations with fractions, and forming linear equations.
- **Simultaneous equations;** including solving simultaneous linear equations, graphically, by elimination or substitution. Solving linear & quadratic equations.
- **Quadratic equations;** including solving quadratic equations by first factorising the equation, by first completing the square or using the quadratic formula. Be able to form quadratic equations.
- **Inequalities;** including understanding inequalities, representing inequalities on a number line and solving linear inequalities.
- **Changing the subject;** including being able to re-arrange formulae where the new subject appears once
- **Graphs;** including drawing straight line graphs, quadratic, cubic, reciprocal and exponential graphs. Identify the gradient and intercept of straight line graphs, equations of parallel and perpendicular lines, the equation of the line between two points, and interpreting real life graphs (including rate of change).
- **Quadratic Graphs;** Use graphs to solve quadratic equations. Identify the turning point and line of symmetry of a quadratic graph from its 'complete the square' form.
- **Laws of Indices;** including evaluating indices and using the laws of indices for multiplying, dividing indices, raising one power by another
- **Algebraic Proof;** Use algebra to prove number statements and disprove number statements using a counter example
- **Algebraic fractions;** Add, subtract, multiply and divide algebraic fractions; Solve equations involving fractions with algebraic denominators

- **Shape**
- **Angles;** including using basic angle rules, angles on parallel lines, interior and exterior angles. Identify parts of a circle.
- **Circle theorems;** Understand, prove and use rules for angles in circles.
- **Bearings;** calculating bearings from a given point.
- **Quadrilaterals & symmetry;** including properties of quadrilaterals, reflective and rotational symmetry and tessellation.
- **Locus and constructions;** including being able to carry out standard compass and ruler constructions and being able to solve locus problems. Constructing triangles using compass, protractor and ruler.
- **2D and 3D shapes;** including being able to name the parts of a circle, name the special quadrilaterals and know their properties, and name the key 3D solids.
- **Area and perimeter;** calculating the circumference and area of circles. Calculating the perimeter and area of rectangles, parallelograms, triangles, trapeziums and compound shapes. Calculating the length of arcs and area of sectors.
- **Volume, surface area & density;** including calculating the volume, surface area and density of prisms, cones, frustums, pyramids and spheres. Use scale factors for surface area and volume for enlargement of similar solids. Calculate pressure. Calculate rates of flow.
- **Pythagoras Theorem;** including understanding and using Pythagoras Theorem. Use Pythagoras Theorem to solve problems in 3 dimensions.
- **Line segments;** including finding the mid-point of a line and the length of a line.
- **Congruency and Similarity;** including identifying congruent similar shapes and finding the lengths of unknown sides for similar shapes.
- **Speed, distance, time;** including calculating using speed, distance, time and drawing and interpreting distance/time and velocity/time graphs for both constant and non-constant acceleration.
- **Trigonometry;** using trigonometry to find the lengths of unknown sides or the size of unknown angles in right-angled triangles. Use Trigonometry to solve problems in 3 dimensions.
- **Maps, plans & measures;** use and construct scale drawings. Bearings.
- **Transformations;** perform and fully describe translations, reflections, rotations and enlargements with both positive and negative scale factors. Understand the meaning of invariance when applied to transformations.
- **3D Vision;** representing 3D shapes using isometric drawings, nets and 2D front, side and plan views factors. Identifying planes of symmetry in 3D solids.
- **Congruent triangles;** identify congruent triangles and use them for geometric proofs.

Handling Data

- **Collecting data;** including surveys and sampling.
- **Representing data;** including drawing bar charts, line graphs, frequency polygons, pie charts and scatter graphs.
- **Recording data;** including frequency tables and two-way tables.
- **Calculating data;** including mean, mode, median and range, and estimating the mean, mode and median from a grouped frequency table. Calculate moving averages.
- **Cumulative frequency;** construct cumulative frequency tables and graphs. Find the median & quartiles for discrete and continuous data. Draw box and whisker plots.
- **Scatter graphs;** draw scatter graphs, identify types of correlation and draw & use lines of best fit.
- **Histograms;** drawing and interpreting histograms, calculating frequency density, finding median from a histogram.
- **Surveys & samples;** understand the handling data cycle, different types of data and questionnaires. Be able to calculate a stratified sample.
- **Set Theory;** including set theory notation and Venn diagrams.
- **Probability;** including the probability scale, the probability of equally likely outcomes, mutually exclusive events and expected probability. Calculating probability of independent and dependant events. Representing probabilities, including conditional probabilities, on probability tree diagrams and Venn diagrams.