|  |  |  |
| --- | --- | --- |
| Okehampton College Curriculum Overview:  Mathematics Higher and Foundation Tier  Edexcel GCSE – New SOL from Sept 2019 | | Reviewed/Updated Oct 2020 by T Nethercott  Reviewed/Updated 2021-2022 by SLC  Under review Aug 2022 SLC |
|  |  |  |
| Term | Year 10 Foundation | Year 10 Higher |
| 1 | 1. **Ratio**  * Understand and use ratios to describe situations * Write in simplest form * Divide in a given ratio, including 3 parts * Simplify or write in a given form (eg 1 : m or m : 1) * Write as a fraction * Solve ratio problems in context * Topic Test  1. **Algebra: Equations and formulae**  * Write expressions and set up simple equations * Solve linear equations with the unknown appearing on one or both sides * Solve linear equations with brackets, negative signs, fractions * Rearrange simple equations * Substitute into formulae * Topic Test  1. **Number: Indices, Prime factors and Standard Form**  * Know and find squares, cubes and roots * Understand index notation and use index laws to evaluate and simplify numerical expressions * Identify factors, multiples and primes * Find prime factor decomposition, LCM and HCF of two numbers * Understand and use standard form, including using a calculator * Topic Test | 1. **Ratio**  * Understand and use ratios to describe situations * Divide in a given ratio, including 3 parts * Simplify or write in a given form (eg 1 : m or m : 1) * Write as a fraction * Use in problem solving, including algebraic * Topic Test  1. **Algebra: Equations and formulae**  * Setting up and solving linear equations, integer, fraction, negative coefficients and solutions, brackets * Rearranging/changing the subject of simple and more complex equations * Substitution into formulae and solving resulting equations * Topic Test  1. **Number: Indices, Prime factors and Surds**  * use index laws to simplify and calculate the value of numerical expressions * evaluate calculations using indices including positive, fractional and negative indices * Understand and use standard form, including using a calculator * Identify factors, multiples and prime numbers; * Find the prime factor decomposition of positive integers, find the LCM and HCF of two numbers and solve problems using HCF and LCM, and prime numbers * Understand surd notation and simplify expressions involving surds * Rationalise the denominator – to include when the denominator is an expression involving a surd * Topic Test |
| 2 | 1. **Right angled triangles**  * Understand, recall and use Pythagoras’ Theorem in 2D * Justify whether a triangle is right angled or not * Leave answers in surd form * Use Pythagoras’ Theorem in problem solving * End of Term Assessment 1  1. **Perimeter and area**  * Use and convert units of measure, including time * Find perimeter of rectangles, triangles, parallelograms and trapezia, and compound shapes * Use formulae for areas of rectangle, triangle, trapezium and parallelogram. * Calculate areas of compound shapes * Find surface area of prisms * Convert between metric area measures * Topic Test | 1. **Right angled triangles**  * Pythagoras’ Theorem – recall (from Y9) and use to find missing sides of a right-angled triangle, justify whether a triangle is right-angled * Calculate length of a line segment, given a pair of points; find lengths in 3D shapes including the diagonal of a cuboid; give answers in surd form * Trigonometry – revisit (Year 9 Unit 13: NOT covered in 2020) the trigonometric ratios sine, cosine and tangent and apply them to find angles and lengths in right-angled triangles * Angles of elevation and depression * Exact values of sinθ, cosθ and tanθ * End of Term Assessment 1  1. **Perimeter, area and volume**  * Recall and use formulae for a variety of plane shapes including trapezium and parallelogram * Area and circumference of circles and composite shapes * Arc lengths and areas of sectors of circles * Volumes and surface areas of prisms, pyramids, cylinders, cones and composite shapes * Degrees of accuracy, upper and lower bounds of measurements and calculations * Error intervals * Topic Test |
| 3 | 1. **Inequalities and simultaneous equations**  * Represent inequalities on a number line * Solve linear inequalities * Solve linear simultaneous equations * Topic Test  1. **Transformations and vectors**  * Rotation * Translation * Reflection * Enlargement * Combined transformations * Vectors * Topic Test | * **Inequalities and simultaneous equations** * Represent inequalities on a number line * Solve linear inequalities * Solve linear simultaneous equations   + By elimination   + By substitution * Topic Test * **Transformations and vectors** * Rotation * Reflection * Translation * Enlargement * Combined transformations * Vectors and geometric proof * Topic Test |
| 4 | 1. **Algebra: Quadratic equations**  * Expand and factorise single brackets * Expand two brackets * Form quadratic expressions * Solving quadratic equations by factorising * Topic Test  1. **Fractions and percentages**  * Fractions – Equivalence and four operations * Fractions, decimals and percentages - equivalence * Percentages   + Numbers as percentages   + Finding percentages of quantities   + Increase/decrease * Year 10 Mocks after Easter Holidays 2023 | * **Algebra: Quadratic equations** * Review expanding one or more brackets * Factorising into one or two brackets * Solve quadratic equations   + By factorising   + By completing the square   + By using the quadratic formula * Topic Test * **Fractions and percentages** * Fractions (recap from Y9) * Percentages (recap from Y9) * Repeated percentage change (compound interest) * Year 10 mocks after Easter Holidays 2023 |
| 5 | 1. **Collecting, representing and analysing data**   Produce and interpret charts and graphs **Graphs, tables and charts**   * Two-way tables```````````````` * Stem and leaf * Scatter graphs * Estimating mean from grouped data * Cumulative frequency graphs * Construct and interpret Pie charts * Statistics and sampling * The averages * Topic Test  1. **Straight line graphs**  * Recap use of coordinates and y=mx+c * Further work with linear graphs including applications and coordinate geometry * Solve simultaneous equations using graphs * Topic Test  1. **Quadratic graphs**  * Generate points and plot graphs of simple quadratic functions, then more general quadratic functions; * Find and recognise the key features of quadratic graphs * Use quadratic graphs to find approximate solutions and interpret graphs from real-life problems  1. **Using and rearranging formulae**  * Substitution * Change the subject of a formula (to include squares and roots) | 1. **Collecting, representing and analysing data**  * Averages and range (review) * Representing and interpreting data * Collecting data * Cumulative frequency, box plots and histograms * Topic Test  1. **Linear graphs and coordinate geometry**  * Recap basics of linear graphs * Applications of linear graphs including simultaneous equations * Further work with linear graphs including coordinate geometry * Topic Test  1. **Non-linear graphs**  * Quadratic * Cubic * Reciprocal  1. **Functions**  * where appropriate, interpret simple expressions as functions with inputs and outputs; * interpret the reverse process as the ‘inverse function’; * interpret the succession of two functions as a ‘composite function’ (the use of formal function notation is expected) * Topic Test |
| 6 | 1. **Constructions, Loci and Bearings**  * Geometric drawing, plans and elevations * Constructions and congruence * Loci * Maps, scale drawings and bearings * Topic Test   **15**. **Angles in polygons**   * Angle properties of 2D shapes * Angles in parallel lines * Angle sums, interior and exterior angles   End of Term test  **16. Trigonometry with right angled triangles**   * Use Sine, Cosine and Tangent ratios to find missing sides and angles in 2D figures * Angles of elevation and depression * Exact values for trigonometric ratios * Topic Test | 1. **Constructions, loci and bearings**  * Elevations of solid shapes * Maps and scale drawings * Standard compass constructions * Loci * Bearings * Topic Test   **15**. **Angles in polygons**   * Angle sums, interior and exterior angles   End of Term test  **16. Advanced Trigonometry**   * Sine rule * Cosine rule * Area of a triangle * Graphs of trigonometric functions * Topic test   **17. Circle Geometry**   * Circle theorems * The equation of a circle (x) * Circle graphs (x) * Circle geometry to included tangents to circles |
| Term | Year 11 Foundation | Year 11 Higher |
| 1 | **17. Circles, cylinders, cones and spheres**   * Circumference/perimeter and area   + Circles and composite shapes   + Sectors of circles * Surface area and volume   + Cylinders   + Cones   + Spheres  1. **Algebra review**  * Review algebraic techniques from Y10: * Solve linear equations with the unknown appearing on one or both sides, brackets, negative signs, fractions * Inequalities * Simultaneous equations * *Quadratic equations*  1. **Ratio (review) and proportion**  * Understand and use ratios, share in a ratio, solve ratio problems * Simplify, write in form 1:m or m:1 * Express relationship as ratio or a fraction * Solve problems using direct and inverse proportion * Best buys, scaling recipes, currency conversions * Interpret the graph form of direct proportion | 1. **Algebra review**  * Review algebraic techniques from Y10 (it may also be appropriate to present more challenging questions than students may have been exposed to when these topics were initially covered, eg ‘show that …’, ‘prove …’) * Algebraic fractions * Quadratic graphs * Further simultaneous equations – one linear and one quadratic * Algebraic Proof |
| 2 | 1. **Probability**  * Theoretical * Experimental * Venn diagrams and set notation * Tree diagrams  1. **Similarity and congruence**  * Congruent triangles * Similar shapes and triangles * Effect of enlargement on perimeter * Problem solving with similar shapes  1. **Real life graphs**  * Draw and interpret graphs representing real-life situations   + Distance-time   + Velocity-time   + Conversion * Interpret linear and non-linear graphs | 1. **Probability**  * Experimental and theoretical measures, relative frequency * Expected outcomes * Venn diagrams, probability trees * Conditional probability * Product Rule for Counting  1. **Similarity and congruence**  * Similarity and congruence in 2D   + Congruent triangle conditions: SSS, SAS, ASA, RHS   + Similar triangles * Lengths, areas and volumes in similar shapes  1. **Trigonometry review (mainly review)**  * Review use of Pythagoras’ Theorem and sine, cosine and tangent ratios in right angled triangles * Use relevant formulae for calculations in non-right angled triangles:   + Sine Rule   + Cosine Rule   + Area of a triangle * Graphs of trigonometric functions * Solve trig equations  1. **Graphs:**   **22a**   * Non-linear graphs * Exponential and reciprocal graphs * Iteration * Representing linear inequalities graphically and solving quadratic inequalities algebraically.   **22b**   * Distance/time and Velocity/time graphs * Gradient and area under graphs * Transformations of graphs |
| 3 | 1. **Proportion and multiplicative reasoning**  * Compound measures * Percentages in more complex problems * Ratio and proportion problems including:   + Growth and decay   + Best buy   + Direct and inverse proportion  1. **Sequences**  * Linear/arithmetic * Special * Quadratic * Geometric  1. **Revise and review** | 1. **Direct and Inverse proportion**  * Use algebraic methods to solve problems involving   + Direct and inverse proportion   + Squares, cubes, roots or other powers   + Graphs and tables of values * Capture/Recapture method  1. **Sequences**  * Linear/arithmetic * Special * Quadratic * Geometric  1. **Revise and review** |