Curriculum Area: Year 11 Foundation Maths

2017/2018

Topics	Year Curriculum	How you can support learning at home, eg. books, websites, family learning through visits
Quadratic equations: expanding and factorising **OBJECTIVES** By the end of the sub-unit, students should be able to: • Define a 'quadratic' expression; • Multiply together two algebraic expressions with brackets; • Square a linear expression, e.g. $(x + 1)^2$; • Factorise quadratic expressions of the form $x^2 + bx + c$; • Factorise a quadratic expression $x^2 - a^2$ using the difference of two squares; • Solve quadratic equations by factorising; Find the roots of a quadratic function algebraically. **Quadratic equations: graphs** **OBJECTIVES** By the end of the sub-unit, students should be able to: • Generate points and plot graphs of simple quadratic functions, then more general quadratic functions; • Identify the line of symmetry of a quadratic graph; • Find approximate solutions to quadratic equations using a graph; • Interpret graphs of quadratic functions from real-life problems; • Identify and interpret roots, intercepts and turning points of quadratic graphs.	AP1	Complete homework tasks on Hegarty Maths. Use the Corbett Maths website for extra practice. Use the Edexcel (9-1) Foundation Revision guide.

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Perimeter, area and volume 2: circles, cylinders, cones and spheres **OBJECTIVES** By the end of the unit, students should be able to: • Recall the definition of a circle and identify, name and draw parts of a circle including tangent, chord and segment; • Recall and use formulae for the circumference of a circle and the area enclosed by a circle circumference of a circle = $2\pi r = \pi d$, area of a circle = πr^2; • Use $\pi \approx 3.142$ or use the π button on a calculator; • Give an answer to a question involving the circumference or area of a circle in terms of π; • Find radius or diameter, given area or perimeter of a circles; • Find the perimeters and areas of semicircles and quarter-circles; • Calculate perimeters and areas of composite shapes made from circles and parts of circles; • Calculate arc lengths, angles and areas of sectors of circles; • Find the surface area and volume of a cylinder; • Find the surface area and volume of spheres, pyramids, cones and composite solids; • Round answers to a given degree of accuracy.		
Fractions **OBJECTIVES** By the end of the sub-unit, students should be able to: • Add and subtract mixed number fractions; • Multiply mixed number fractions; • Divide mixed numbers by whole numbers and vice versa; • Find the reciprocal of an integer, decimal or fraction; • Understand 'reciprocal' as multiplicative inverse, knowing that any non-zero number multiplied by its reciprocal is 1 (and that zero has no reciprocal because division by zero is not defined).	AP2	Complete homework tasks on Hegarty Maths. Use the Corbett Maths website for extra practice. Use the Edexcel (9-1) Foundation revision guide.

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Indices and standard form

OBJECTIVES

By the end of the sub-unit, students should be able to:

- Use index laws to simplify and calculate the value of numerical expressions involving multiplication and division of integer powers, fractions and powers of a power;
- Use numbers raised to the power zero, including the zero power of 10;
- Convert large and small numbers into standard form and vice versa;
- Add, subtract, multiply and divide numbers in standard form;
- Interpret a calculator display using standard form and know how to enter numbers in standard form.

Similarity and congruence in 2D

OBJECTIVES

By the end of the sub-unit, students should be able to:

- Use the basic congruence criteria for triangles (SSS, SAS, ASA and RHS);
- Solve angle problems involving congruence;
- Identify shapes which are similar; including all circles or all regular polygons with equal number of sides;
- Understand similarity of triangles and of other plane shapes, use this to make geometric inferences, and solve angle problems using similarity;
- Identify the scale factor of an enlargement of a shape as the ratio of the lengths of two corresponding sides;
- Understand the effect of enlargement on perimeter of shapes;
- Solve problems to find missing lengths in similar shapes;
- Know that scale diagrams, including bearings and maps are 'similar' to the real-life examples.

Vectors

OBJECTIVES

By the end of the sub-unit, students should be able to:

- Understand and use column notation in relation to vectors;
- Be able to represent information graphically given column vectors;
- Identify two column vectors which are parallel;

Calculate using column vectors, and represent graphically, the sum of two vectors, the difference of two vectors and a scalar multiple of a vector.

Rearranging equations, graphs of cubic and reciprocal functions and simultaneous equations

OBJECTIVES

By the end of the unit, students should be able to:

- Know the difference between an equation and an identity and use and understand the ≠ symbol;
- Change the subject of a formula involving the use of square roots and squares;
- Answer 'show that' questions using consecutive integers (n, $n + 1$), squares a^2, b^2, even numbers $2n$, and odd numbers $2n +1$;
- Solve problems involving inverse proportion using graphs, and read values from graphs;
- Find the equation of the line through two given points;
- Recognise, sketch and interpret graphs of simple cubic functions;
- Recognise, sketch and interpret graphs of the reciprocal function $y = \dfrac{1}{x}$ with $x \neq 0$;
- Use graphical representations of indirect proportion to solve problems in context;
- identify and interpret the gradient from an equation $ax + by = c$;
- Write simultaneous equations to represent a situation;
- Solve simultaneous equations (linear/linear) algebraically and graphically;
- Solve simultaneous equations representing a real-life situation, graphically and algebraically, and interpret the solution in the context of the problem;

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Exam preparation	AP3	Complete homework tasks on Hegarty Maths. Use the Corbett Maths website for extra practice. Use the Edexcel (9-1) Foundation Revision guide.
Exam preparation	AP4	Complete homework tasks on Hegarty Maths. Use the Corbett Maths website for extra practice. Use the Edexcel (9-1) Foundation Revision guide.
Exam Period	AP5	Complete homework tasks on Hegarty Maths. Use the Corbett Maths website for extra practice. Use the Edexcel (9-1) Foundation Revision guide.
Exam Period	AP6	Complete homework tasks on Hegarty Maths. Use the Corbett Maths website for extra practice. Use the Edexcel (9-1) Foundation Revision guide.