

JUNIOR CYCLE MATHS OVERVIEW - ACADEMIC YEAR 2022/2023

FIRST YEAR

| Term 1 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
|--------|----------------------------|---------------------------------|---|
| | Number | Order of operations | <ul style="list-style-type: none"> Perform operations of addition, subtraction, multiplication and division on natural numbers Use BEMDAS |
| | Number | Natural Numbers | <ul style="list-style-type: none"> Calculate and interpret factors (including the highest common factor), multiples (including the lowest common multiple) and prime numbers |
| | Number | Integers | <ul style="list-style-type: none"> Perform operations of addition, subtraction, multiplication and division on integers |
| | Statistics and Probability | Collecting and Processing Data | <ul style="list-style-type: none"> Generate a statistical question Collect, organise and classify data |
| | Statistics and Probability | Averages and the Spread of Data | <ul style="list-style-type: none"> Calculate mean, mode, median and range |
| | Statistics and Probability | Representing Data | <ul style="list-style-type: none"> Represent data graphically Discuss misuses of statistics |
| | Algebra and Functions | Algebra | <ul style="list-style-type: none"> Add, subtract, multiply, divide and simplify expressions Find the value of expressions given the value of the variables |
| | Algebra and Functions | Linear Equations | <ul style="list-style-type: none"> Solve linear equations |

Christmas Exams

| Terms 2 & 3 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
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| | Number | Fractions | <ul style="list-style-type: none"> Perform operations of addition, subtraction, multiplication and division on fractions |
| | Number | Decimals | <ul style="list-style-type: none"> Perform operations of addition, subtraction, multiplication and division on decimals Present numerical answers to the degree of accuracy specified, for example, correct to the nearest hundred, to two decimal places, or to three significant figures |
| | Number | Sets | <ul style="list-style-type: none"> Understand the concept of a set Use and understand set terminology Use Venn diagrams to solve problems |
| | Number | Ratio and Proportion | <ul style="list-style-type: none"> Use and understand ratio and proportion |
| | Number | Percentages | <ul style="list-style-type: none"> Calculate percentages Solve money related problems including bills, profit and loss and percentage profit and loss |

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| Geometry and Trigonometry | Points, Lines and Angles | <ul style="list-style-type: none"> Identify types of angles, triangles and calculate angles |
| Geometry and Trigonometry | Constructions | <ul style="list-style-type: none"> Perform the following constructions Bisector of an angle, using only compass and straight edge Perpendicular bisector of a line segment, using only compass and straight edge Line perpendicular to a given line l, passing through a given point on l Line parallel to a given line, through a given point Division of a line segment into 2 or 3 equal segments without measuring it Line segment of a given length on a given ray |
| Geometry and Trigonometry | Coordinate Geometry of the Line | <ul style="list-style-type: none"> Plot points Find and interpret the slope of a line using $\pm \frac{\text{Rise}}{\text{Run}}$, no formula, just graph work Find and interpret the midpoint of a line segment, no formula, the concept of adding the x coordinates and dividing by 2, adding the y coordinates and dividing by 2 |
| Number | Real-life Applications of Graphs | <ul style="list-style-type: none"> Investigate situations involving proportionality so that they can solve problems involving proportionality |
| Algebra and Functions | Factors | <ul style="list-style-type: none"> Factorise highest common factor, factors by grouping, quadratic trinomials and difference of two squares |
| Geometry and Trigonometry | Perimeter, Area and Volume | <ul style="list-style-type: none"> Find the perimeter and area of squares, rectangles, triangles and parallelograms |
| Algebra and Functions | Simultaneous Equations | <ul style="list-style-type: none"> Solve simultaneous equations |

Summer Exams

JUNIOR CYCLE MATHS OVERVIEW - ACADEMIC YEAR 2022/2023

SECOND YEAR – ORDINARY LEVEL

| Term 1 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
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| | Statistics and Probability | Statistics 1 | <ul style="list-style-type: none"> • Generate a statistical question • Collect, organise and classify data |
| | Statistics and Probability | Statistics 2 | <ul style="list-style-type: none"> • Calculate mean, mode, median and range |
| | Statistics and Probability | Statistics 3 | <ul style="list-style-type: none"> • Represent data graphically • Discuss misuses of statistics |
| | Algebra and Functions | Algebra 1 | <ul style="list-style-type: none"> • Add, subtract, multiply, divide and simplify expressions • Find the value of expressions given the value of the variables • Solve linear equations |
| | Statistics and Probability | Probability | <ul style="list-style-type: none"> • Generate a sample space for an experiment • Demonstrate understanding of probability scale • Demonstrate understanding of theoretical and experimental probability • Use the fundamental principle of counting |
| | Geometry and Trigonometry | Geometry 1: Triangles and Quadrilaterals | <ul style="list-style-type: none"> • Use the terms theorem, proof, axiom, corollary and converse • Identify types of angles, triangles, quadrilaterals and calculate angles • Find the length of a side in a right-angled triangle |
| Christmas Exams | | | |
| Terms 2 & 3 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
| | Number | Applied Arithmetic | <ul style="list-style-type: none"> • Solve money related problems including bills, VAT, profit and loss, percentage profit and loss, compound interest, income tax and currency exchange |
| | Geometry and Trigonometry | Perimeter, Area, Volume | <ul style="list-style-type: none"> • Find the perimeter and area of squares, rectangles, triangles and parallelograms • Find the volume and surface area of rectangular solids • Draw and interpret nets of rectangular solids • Draw and interpret scaled diagrams |
| | Number | Time and Speed | <ul style="list-style-type: none"> • Interpret timetables • Calculate distance, speed and time |
| | Number | Number 1 | <ul style="list-style-type: none"> • Perform operations of addition, subtraction, multiplication and division on natural numbers, integers, fractions and decimals • Calculate percentages • Use BEMDAS |

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| | | | <ul style="list-style-type: none">• Calculate highest common factor and lowest common multiple• Use and understand ratio and proportion |
| | Algebra and Functions | Simultaneous Equations | <ul style="list-style-type: none">• Solve simultaneous equations |
| | Number | Sets | <ul style="list-style-type: none">• Understand the concept of a set• Use and understand set terminology• Use Venn diagrams to solve problems |

Summer Exams

JUNIOR CYCLE MATHS OVERVIEW - ACADEMIC YEAR 2022/2023

THIRD YEAR – ORDINARY LEVEL

| Term 1 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
|------------------------|---------------------------|---|---|
| | Algebra and Functions | Factors | <ul style="list-style-type: none"> Factorise highest common factor, factors by grouping, quadratic trinomials and difference of two squares |
| | Algebra and Functions | Quadratic Equations | <ul style="list-style-type: none"> Solve quadratic equations |
| | Geometry and Trigonometry | Trigonometry | <ul style="list-style-type: none"> Evaluate and use trigonometric ratios (sin, cos and tan, defined in terms of right-angled triangles) and their inverses involving angles between 0° and 90° at integer values |
| | Algebra and Functions | Patterns and Sequences | <ul style="list-style-type: none"> Investigate patterns and relationships (linear, quadratic, doubling and tripling) Categorise patterns as linear and non-linear Generate a generalised expression for linear patterns Graph linear patterns |
| | Algebra and Functions | Functions | <ul style="list-style-type: none"> Demonstrate understanding of the concept of a function Represent and interpret functions in words and algebraically, using the language and notation of functions |
| | Algebra and Functions | Graphing Functions | <ul style="list-style-type: none"> Represent and interpret functions graphically – linear and quadratic Make connections between the shape of a graph and the story of a phenomenon |
| Christmas Exams | | | |
| Terms 2 & 3 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
| | Geometry and Trigonometry | Coordinate Geometry: The Line | <ul style="list-style-type: none"> Plot points Find and interpret distance, midpoint, slope, point of intersection and slopes of parallel lines Find and interpret the equation of a line, including finding the slope, the y-intercept and other points on the line Draw graphs of line segments |
| | Geometry and Trigonometry | Circles and Cylinders | <ul style="list-style-type: none"> Find the circumference and area of circles Find the volume of cylinders |
| | Number | Drawing and Interpreting Real-life Graphs | <ul style="list-style-type: none"> Investigate situations involving proportionality so that they can solve problems involving proportionality including those involving currency Conversion and those involving average speed, distance and time |
| | Geometry and Trigonometry | Geometry 2: Triangles and Circles | <ul style="list-style-type: none"> Identify if two triangles are congruent using four tests for congruency Prove geometric properties using congruent triangles Identify two triangles as similar by comparing their angles Find missing sides in similar triangles using ratio Identify and calculate angles within circles |

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| | Number | Number 2: Indices and Standard Form | <ul style="list-style-type: none"> Investigate the representation of numbers and arithmetic operations so they can explore numbers written in index form, present numerical answers to the degree of accuracy specified and convert the number in decimal form to the form $a \times 10^n$ |
| | Geometry and Trigonometry | Geometry 3: Transformations, Constructions, Proofs | <ul style="list-style-type: none"> Recognise and draw the image of points and objects under translation, central symmetry, axial symmetry and rotation Draw the axes of symmetry of shapes Perform constructions Recall theorems |
| | Algebra and Functions | Algebra 2: Inequalities, Algebraic Fractions | <ul style="list-style-type: none"> Solve linear inequalities in one variable graph the solution sets on the number line Add, subtract and simplify linear expressions involving fractions |

State Examinations

JUNIOR CYCLE MATHS OVERVIEW - ACADEMIC YEAR 2022/2023

SECOND YEAR – HIGHER LEVEL

| Term 1 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
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| | Number | Ratio, Time, Speed | <ul style="list-style-type: none"> • Use and understand ratio and proportion • Interpret timetables • Calculate distance, speed and time |
| | Algebra and Functions | Algebra 1 | <ul style="list-style-type: none"> • Add, subtract, multiply, divide and simplify expressions • Find the value of expressions given the value of the variables • Solve linear equations • Solve linear inequalities in one variable graph the solution sets on the number line |
| | Algebra and Functions | Factors | <ul style="list-style-type: none"> • Factorise highest common factor, factors by grouping, quadratic trinomial and difference of two squares • Use factors to simplify algebraic expressions |
| | Number | Applied Arithmetic | <ul style="list-style-type: none"> • Solve money related problems including bills, VAT, profit and loss, percentage profit and loss, mark up, margin, compound interest, income tax and currency exchange |
| | Number | Sets | <ul style="list-style-type: none"> • Understand the concept of a set • Use and understand set terminology • Use Venn diagrams to solve problems • Investigate whether set operations are commutative and/or associative |
| | Number | Ratio, Time, Speed | <ul style="list-style-type: none"> • Use and understand ratio and proportion • Interpret timetables • Calculate distance, speed and time |
| Christmas Exams | | | |
| Terms 2 & 3 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
| | Algebra and Functions | Quadratic Equations | <ul style="list-style-type: none"> • Solve quadratic equations • Generate quadratic equations given integer roots |
| | Statistics and Probability | Probability | <ul style="list-style-type: none"> • Generate a sample space for an experiment • Demonstrate understanding of probability scale • Demonstrate understanding of theoretical and experimental probability • Use the fundamental principle of counting |
| | Geometry and Trigonometry | Perimeter, Area, Volume | <ul style="list-style-type: none"> • Find the perimeter and area of squares, rectangles, triangles and parallelograms • Find the circumference and area of circles • Find the volume and surface area of rectangular solids and prisms |

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| | | | <ul style="list-style-type: none"> • Draw and interpret nets of rectangular solids and prisms • Draw and interpret scaled diagrams |
| | Geometry and Trigonometry | Cylinder, Sphere | <ul style="list-style-type: none"> • Find the volume and surface area of cylinders, spheres and hemispheres • Draw and interpret nets of cylinders |
| | Algebra and Functions | Simultaneous Equations | <ul style="list-style-type: none"> • Solve simultaneous equations |
| | Algebra and Functions | Algebra 2 | <ul style="list-style-type: none"> • Add, subtract and simplify linear expressions involving fractions • Solve linear equations involving fractions • Rearrange, evaluate and write formulae |
| | Geometry and Trigonometry | Coordinate Geometry – the Line | <ul style="list-style-type: none"> • Find and interpret distance, midpoint, slope, point of intersection and slopes of parallel and perpendicular lines • Find and interpret the equation of a line, including finding the slope, the y-intercept and other points on the line • Draw graphs of line segments |

Summer Exams

JUNIOR CYCLE MATHS OVERVIEW - ACADEMIC YEAR 2022/2023

THIRD YEAR – HIGHER LEVEL

| Term 1 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
|--------|---------------------------|--|--|
| | Geometry and Trigonometry | Trigonometry | <ul style="list-style-type: none"> Evaluate and use trigonometric ratios (sin, cos and tan, defined in terms of right-angled triangles) and their inverses involving angles between 0° and 90° at integer values and in decimal form |
| | Algebra and Functions | Patterns and Sequences | <ul style="list-style-type: none"> Investigate patterns and relationships (linear, quadratic, doubling and tripling) Categorise patterns as linear, non-linear, quadratic and exponential Generate a generalised expression for linear and quadratic patterns Graph linear, quadratic and exponential patterns |
| | Geometry and Trigonometry | Geometry 1 – Triangles, Quadrilaterals, Theorems | <ul style="list-style-type: none"> Use the terms theorem, proof, axiom, corollary and converse Identify types of angles, triangles, quadrilaterals and calculate angles Find the length of a side in a right-angled triangle Identify if two triangles are congruent using four tests for congruency Prove geometric properties using congruent triangles Understand proofs of theorems 1, 2, 3, 5, 10, 13, 15 |
| | Algebra and Functions | Functions | <ul style="list-style-type: none"> Demonstrate understanding of the concept of a function Represent and interpret functions in words and algebraically, using the language and notation of functions |
| | Algebra and Functions | Graphing Functions | <ul style="list-style-type: none"> Represent and interpret functions graphically – linear, quadratic and exponential Make connections between the shape of a graph and the story of a phenomenon |

Christmas Exams

| Terms 2 & 3 | Strands: | Unit Of Learning: | Learning Outcomes – Students should be able to... |
|-------------|----------------------------|---|---|
| | Statistics and Probability | Statistics 1 – Collecting Data | <ul style="list-style-type: none"> Generate a statistical question Collect, organise and classify data |
| | Statistics and Probability | Statistics 2 – Averages and Variability | <ul style="list-style-type: none"> Calculate mean, mode, median and range |
| | Statistics and Probability | Statistics 3 – Presenting Data | <ul style="list-style-type: none"> Represent data graphically Discuss misuses of statistics |
| | Number | Drawing and Interpreting Real-life Graphs | <ul style="list-style-type: none"> Investigate situations involving proportionality so that they can solve problems involving proportionality including those involving currency conversion and those involving average speed, distance and time |
| | Geometry and Trigonometry | Geometry 2 – Similar Triangles, Circles, Theorems | <ul style="list-style-type: none"> Identify two triangles as similar by comparing their angles Find missing sides in similar triangles using ratio Understand transversals and triangles |

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| | | | <ul style="list-style-type: none"> • Identify and calculate angles within circles • Understand proof of theorems 4, 6, 9, 14, 19 |
| | Geometry and Trigonometry | Geometry 3 – Transformations, Constructions | <ul style="list-style-type: none"> • Recognise and draw the image of points and objects under translation, central symmetry, axial symmetry and rotation • Draw the axes of symmetry of shapes • Perform constructions |
| | Number | Indices – Standard Form – Surds | <ul style="list-style-type: none"> • Investigate the representation of numbers and arithmetic operations so they can explore numbers written in index form, present numerical answers to the degree of accuracy specified and convert the number in decimal form to the form $a \times 10^n$ perform operations on surds |

State Examinations