

Hobart High School Key Stage 4 Curriculum Map – Higher

YEAR 10

	Unit, Topic or Summary of work covered	Knowledge & Skills Developed	Assessment	Personal Development
Autumn 1	Repeated percentage change	Compound interest calculations (U332) Growth and decay (U988)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework. Towards the end of a half term pupils will complete a test which includes recent topics and recall questions	Development of financial literacy can help students understand the impact of interest on savings and loans and comprehend how investments grow over time. Discussing these mathematical concepts in the context of ethical and environmental awareness can provide insights into issues like resource consumption and sustainability.
	Surface area	Finding the surface area of pyramids (U871) Finding the surface area of cones (U523) Finding the surface area of spheres (U893) Finding the surface area of frustums* (U334) Finding the surface area of composite shapes* (U561)		Development of spatial reasoning and visualization skills. These concepts are applicable to situations such as calculating materials needed for construction or design projects.
	Volume	Finding the volume of pyramids (U484) Finding the volume of cones (U116) Finding the volume of spheres (U617) Finding the volume of frustums* (U350) Finding the volume of composite shapes*(U543)		Visualisation and manipulation of 3 dimensional objects. Links to architecture through famous landmarks such as the Great Pyramid, the Louvre or Sydney Opera house
Autumn 2	Linear simultaneous equations	Solving simultaneous equations using elimination (U760) Solving simultaneous equations using substitution (U757) Solving simultaneous equations graphically (U836) Constructing and solving simultaneous equations (U137)	Towards the end of a term pupils will complete a test which includes recent topics and recall questions	Simultaneous equations are used to model situations that have multiple variables, practical applications in real-world scenarios such as budgeting, engineering, and optimization in business.

	Rearranging formulae	Changing the subjects of formulae with two or more steps (U181) Changing the subject when the subject appears more than once (U191)		Algebraic skills can be applied to a variety of real-world contexts such as engineering, scientific, and financial calculations.
	Right-angled trigonometry	Understanding sin, cos, tan (U605) Finding unknown sides in right-angled triangles (U283) Finding unknown angles in right-angled triangles (U545) Using the exact values of trigonometric ratios (U627) Angles of elevation and depression* (U967) Calculating with trigonometry and bearings* (U164)		
	Constructions and loci	Constructing loci (U820)		
Spring 1	Equations of linear graphs	Equations of parallel lines (U377) Finding the equation of a straight line from its gradient and a point (U477) Finding the equation of a straight line from two points on the line (U848) Equations of parallel and perpendicular lines* (U898)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework. Towards the end of a half term pupils will complete a test which includes recent topics and recall questions	Graphs are used to visually model real world situations, they are used to analyse trends, make predictions and inform decisions. Graphical skills have a wide range of applications from science to data analysis.
	Plotting and interpreting real-life graphs	Plotting linear real-life graphs (U652) Using and finding equations of linear real-life graphs (U862) Sketch graphs of water flows (U896)		
				Tree diagrams for independent and dependent events are valuable tools for visualizing and analyzing probabilities in real-world scenarios, such as calculating the likelihood of various outcomes in games, genetics, or decision-making processes, enabling students to understand complex relationships and make informed predictions based on data.

	Venn diagrams and set notation	Venn diagrams with set notation (U748) Using set notation (U296)		
	Independent and dependent events	Tree diagrams for independent events (U558) Tree diagrams for dependent events (U729)		
Spring 2	Density and pressure	Calculating with density (U910) Calculating with pressure (U527)	Towards the end of a term pupils will complete a test which includes recent topics and recall questions	Calculating with density and pressure is crucial for understanding real-world applications in fields like physics, engineering, and environmental science.
	Working with ratios and algebra	Combining ratios (U921) Calculating with ratios and algebra (U676) Changing ratios (U865)		Combining, calculating with, and changing ratios includes problems in areas such as cooking, finance, and engineering, where understanding proportions helps students make informed decisions regarding resource allocation, scaling recipes, or analysing data relationships,
	Velocity-time graphs	Calculating acceleration from velocity-time graphs (U562) Plotting velocity-time graphs (U937)		Motion in real-world contexts, such as physics and engineering, helps students analyse speed changes over time, enabling them to interpret dynamic systems, predict behaviours
	Cubic, reciprocal and exponential graphs	Graphs of cubic functions (U980) Graphs of reciprocal functions (U593) Graphs of exponential functions* (U229)		
Summer 1	Quadratic and geometric sequences	Position-to-term rules for quadratic sequences (U206) Position-to-term rules for geometric sequences (U958) Special sequences (U680)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework. Towards the end of a half term pupils will complete a test which	

	Sampling	Sampling and bias (U162) Capture-recapture (U328)	includes recent topics and recall questions	Sampling and bias, along with capture-recapture methods, are crucial for understanding data collection and analysis in research and statistics
	Direct and inverse proportion	Constructing direct proportion equations (U407) Constructing inverse proportion equations (U138) Graphs of direct and inverse proportion (U238)		Direct and inverse proportion equations enables students to model real-world relationships, such as in economics and physics. Graphs of direct and inverse proportion further illustrate these concepts, helping students visualize and interpret the impact of changing variables in practical scenarios, such as resource distribution and speed calculations.
	Transforming shapes	Enlargement by a positive or negative scale factor (U134) Combining transformations (U766)		
	Bounds	Finding bounds for calculations (U587)		Accurately estimating values and assessing uncertainty in real-world scenarios, and make informed decisions when dealing with measurement errors or varying conditions in practical applications.
	Index laws	Estimating roots and powers (U299) Indices of the form $1/a$ (U985) Indices of the form a/b (U772)		
Summer 2	Fractions and recurring decimals	Converting fractions to recurring decimals (U550) Converting recurring decimals to fractions (U689)	Alongside the regular formative feedback, pupils will sit two formative assessments. The first is an internal assessment covering the content from Y10. The	

	Expanding and factorising brackets	Expanding triple brackets (U606) Completing the square (U397) Factorising quadratic expressions of the form ax^2+bx+c (U858) Finding the turning point of a quadratic graph by completing the square (U769)	second is a slightly modified GCSE paper (Paper 1 from the most recent series)	Entry skills into eventually being able to solve complex equations and model real-world scenarios such as projectile motion and optimization problems, contributing to applications in areas like physics, economics, and engineering design.
	Cumulative frequency graphs	Drawing cumulative frequency graphs (U182) Interpreting cumulative frequency graphs (U642)		Comparing populations and understanding distributions in real-world contexts, such as social mobility.
	Box plots	Drawing box plots (U879) Interpreting box plots (U837) Comparing populations using box plots and cumulative frequency graphs (U507)		Enables students to make informed conclusions based on statistical evidence and enhance their critical thinking skills in decision-making processes.

- **Higher content only**

Hobart High School Key Stage 4 Curriculum Map – Higher

YEAR 11

	Unit, Topic or Summary of work covered	Knowledge & Skills Developed	Assessment	Personal Development
Autumn 1	Calculating with surds	Multiplying and dividing surds (U633) Simplifying surds (U338) Adding and subtracting surds (U872) Expanding brackets with surds (U499)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework.	Working with irrational numbers is applicable in fields such as engineering and physics, where precise calculations are necessary, and they enhance students' ability to work with complex mathematical operations.
	Rationalising denominators	Rationalising denominators containing a single term (U707) Rationalising denominators containing two terms (U281)		
	Calculating with algebraic fractions	Simplifying algebraic fractions by factorising into one bracket (U437) Simplifying algebraic fractions by factorising into two brackets (U294) Adding and subtracting algebraic fractions (U685) Multiplying algebraic fractions (U457) Dividing algebraic fractions (U824)		
	Solving quadratic equations	Factorising to solve quadratic equations of the form $ax^2+bx+c=0$ (U960) Solving quadratic equations by completing the square (U589) Solving quadratic equations using the quadratic formula (U665) Constructing and solving quadratic equations (U150) Solving quadratic equations graphically (U601)		Entry skills into eventually being able to solve complex equations and model real-world scenarios such as projectile motion and optimization problems, contributing to applications in areas like physics, economics, and engineering design
	Simultaneous equations	Solving simultaneous equations involving quadratics (U547) Solving simultaneous equations involving quadratics graphically (U875)		

Autumn 2	Trigonometric ratios and graphs	Using the exact values of trigonometric ratios – Higher (U319) Graphs of trigonometric functions (U450)	Alongside the regular formative feedback, pupils will sit a mock GCSE paper (Paper 2 from the most recent series)	Using the exact values of trigonometric ratios and understanding graphs of trigonometric functions are foundational skills for analyzing periodic phenomena in real-world contexts such as sound waves, light, and engineering.
	Non right-angled trigonometry	The sine rule (U952) The cosine rule (U591) The area rule (U592)		The sine and cosine rules, along with the area rule, are critical for solving problems involving non-right triangles, applicable in fields like architecture, navigation, and physics,
	3D Pythagoras' theorem and trigonometry	Using Pythagoras' theorem in 3D (U541) Trigonometry in 3D shapes (U170)		Using Pythagoras' theorem and applying trigonometry to 3D shapes are critical skills for solving problems involving spatial relationships, essential in fields like architecture, engineering, and robotics. These concepts enable students to analyze three-dimensional structures, calculate distances, and determine angles, providing valuable tools for understanding and designing complex systems in real-world applications.
	Circle theorems	Angles subtended at the centre or circumference of a circle (U459) Angles in segments and cyclic quadrilaterals (U251) Circle theorems for chords and tangents (U489) Alternate segment theorem (U130)		
	Histograms	Drawing histograms with equal class widths (U185) Drawing histograms with unequal class widths (U814) Interpreting histograms (U983) Calculating averages from histograms (U267)		

Spring 1	Conditional probability	Conditional probabilities from tables (U246) Conditional probabilities from Venn diagrams (U699) Using the conditional probability formula (U821) Conditional probabilities from tree diagrams (U806) Using the product rule for counting (U369)	We continually assess student progress via low stake quizzes, effective questioning, work samples during independent tasks and homework.	These concepts are particularly applicable in real-world contexts such as risk assessment, decision-making in business, and statistical analysis, helping students interpret data effectively and make informed conclusions based on probabilities.
	Linear and quadratic inequalities	Graphs of linear inequalities (U747) Solving quadratic inequalities (U133)		Make informed decisions based on constraints in real-world contexts, such as budgeting, resource allocation, and optimization problems. These concepts enable students to visualize and interpret feasible regions, helping them understand how to navigate situations with multiple conditions while reinforcing their algebraic reasoning and analytical capabilities in various applications, including economics and environmental planning.
	Substituting into functions	Substituting into functions (U637) Substituting into composite functions (U895)		
	Finding composite and inverse functions	Finding composite functions (U448) Finding inverse functions (U996)		
	Transforming graphs	Translating graphs (U598) Reflecting graphs (U487) Transforming graphs (U455)		
	Using iterative formulae	Using recurrence relations (U171) Substituting into iterative formulae (U434) Finding approximate solutions to equations using iteration (U168)		Recurrence relationships, such as substituting into iterative formulae to find approximate solutions to equations, are vital skills in mathematical modelling and numerical analysis. These techniques are applicable in various real-world contexts, such as computer science

				algorithms, financial forecasting, and engineering simulations
Spring 2	Writing algebraic proofs	Writing algebraic proofs(U582)	Alongside the regular formative feedback, pupils will sit a mock GCSE paper (Paper 3 from the most recent series)	Mathematical proof is foundational in real-world applications such as architecture, engineering design, and various fields of science, enabling students to validate concepts and relationships in geometry, thereby enhancing their ability to construct and analyse arguments effectively.
	Area and volume of similar shapes	Finding the perimeter and area of similar shapes (U630) Finding the surface area and volume of similar shapes (U110)		
	Vector proofs	Solving geometric problems using vectors (U781) Geometric proofs with vectors (U560)		
	Writing geometric proofs	Geometric proofs with angle facts (U471) Geometric proofs with congruence and similarity (U887) Proving the circle theorems (U807)		Mathematical proof is foundational in real-world applications such as architecture, engineering design, and various fields of science, enabling students to validate concepts and relationships in geometry, thereby enhancing their ability to construct and analyse arguments effectively.
	Non-linear graphs	Estimating gradients of non-linear graphs using tangents (U800) Calculating distances from velocity-time graphs (U611) Estimating areas under non-linear graphs (U882) Equations of circles and tangents (U567)		Understanding the behaviour of calculations in dynamic situations and interpreting data in various real-world contexts, such as physics, engineering, and environmental science. Developing an introductory understanding of geometric relationships and solve practical problems involving curves and circular motion.
Summer	Revision			