Year 7 Maths
Term 1

Trinity Bay SHS
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Assessment Details	
Type	2 Summative Exams
Conditions	60 Minutes in class, Tech Active.
Date	Week 5, Week 10

Achievement Standard

- apply knowledge of angle relationships and the sum of angles in a triangle to solve problems, giving reasons.
- use formulas for the areas of triangles and parallelograms and the volumes of rectangular and triangular prisms to solve problems.
- describe the relationships between the radius, diameter and circumference of a circle.
- classify polygons according to their features and create an algorithm designed to sort and classify shapes.
- represent objects two-dimensionally in different ways, describing the usefulness of these representations

Week	**Curriculum Intent**	**Learning Advice**
1	**Topic 1: Triangles, Quadrilaterals and Angle Relations**	
	☐ Recall that acute angles are smaller than 90°, obtuse angles are between 90° and 180°, a right angle is 90°, a straight angle/line is 180° and there are 360° in a revolution. ☐ Classify triangles as equilateral, isosceles or scalene, and as obtuse, acute or right angled.	Geometry Booklet Ex 1-3
2	☐ Understand that the internal angles in a triangle add up to 180° and thus find missing angles in triangles. ☐ Classify quadrilaterals as squares, rectangles, rhombuses, parallelograms, kites, trapeziums or irregular quadrilaterals ☐ Understand that the internal angles in a quadrilateral add up to 360° and thus find missing angles in quadrilaterals.	Ex 4-8
3	☐ Identify corresponding, alternate and co-interior angles that are formed when two parallel lines are crossed by a transversal ☐ Use angle relations to solve problems	Ex 9-11
4	☐ Solve more complex problems involving angle relationships, triangles and quadrilaterals	Ex 12-13 **Diagnostic Test**
5	**Summative Exam #1 – Geometry** (first or second lesson of the week) (20% of Semester grade)	
	Topic 2: Measurement	
	☐ Find the perimeter of shapes ☐ Use the formula $A = L \times W$ to find the area of a rectangles	Measurement Booklet Ex 1-2
6	☐ Use the formula $A = \frac{b \times h}{2}$ to find the area of a triangle ☐ Use the formula $A = b \times h$ to find the area of a parallelogram ☐ Solve mixed area problems	Ex 3-5
7	☐ Use the formula $V = L \times W \times H$ to find the volume of a rectangular prism ☐ Use the formula $V = \frac{(b \times h_1 \times h_2)}{2}$ to find the volume of a triangular prism ☐ Use the formula $V = Area\ of\ base \times Height\ of\ prism$ to find the volume of prisms generally	Ex 6-9
8	☐ Solve problems involving the area and volume of shapes and objects ☐ Identify the radius and diameter of a circle ☐ Understand that the radius of a circle is half the length of its diameter, and the diameter of a circle is two times the length of its radius ☐ Understand that the number π, which is approximately 3.14, is used to find a circle's circumference given its diameter or radius, such that $Circumference = \pi D$ and $Circumference = 2\pi r$	Ex 10-12 **Diagnostic Test**
9	**Topic 3: Representing 3 dimensional objects 2 dimensionally**	
	☐ Creating nets of cubes, rectangular prisms and triangular prisms ☐ Drawing the top view, front view and side views of objects ☐ Drawing isometric projections of rectangular prisms ☐ Describing the usefulness of each of these representations	Ex 13
	Revision of Topic 2 and Topic 3	
10	☐ Summative Exam on Topics 2 and 3 (20% of Semester Grade)	

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Year 7 Maths
Term 2

Assessment Details	
Type	Exam 1: Index Notation Exam 2: Probability and Statistics
Conditions	Exam: 50 Minutes in class, Tech Active.
Date	Week 4, Week 10.

Achievement Standard

- students represent natural numbers in expanded form and as products of prime factors, using exponent notation.
- They solve problems involving squares of numbers and square roots of perfect square numbers.
- They plan and conduct statistical investigations involving discrete and continuous numerical data, using appropriate displays.
- Students interpret data in terms of the shape of distribution and summary statistics, identifying possible outliers.
- They decide which measure of central tendency is most suitable and explain their reasoning.
- Students list sample spaces for single step experiments, assign probabilities to outcomes and predict relative frequencies for related events.
- They conduct repeated single-step chance experiments and run simulations using digital tools, giving reasons for differences between predicted and observed results.

Week	Curriculum Intent	Learning Advice
1	**Topic 1: Index notation (Exponent notation)**	
	☐ Identify the base and index (exponent) of expressions in index notation ☐ Move between index and expanded notation: $3^4 = 3 \times 3 \times 3 \times 3$ ☐ Recall the first 10 perfect square numbers: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100 ☐ Recall the square roots of the first 10 perfect square numbers	Exercises 1-3
2	☐ Express numbers in power of 10 expanded form: $2356 = (2 \times 10^3) + (3 \times 10^2) + (5 \times 10^1) + 6$ ☐ Construct factor trees and express numbers as powers of their prime factors in index notation: $72 = 2^3 \times 3^2$ ☐ Use calculator functions to find the square roots of numbers, to evaluate expressions in index form, and to express numbers as products of their prime factors in index form.	Exercises 4-6
3	☐ Consolidate prior learning **Extension Work** ☐ Use prime factorisation to find the Lowest Common Multiple (LCM) and Highest Common Factor (HCF) of pairs of numbers.* ☐ Use calculator functions to find the HCF and LCM of pairs of numbers.* ☐ Solve problems involving HCF and LCM, square roots and indices.*	Consolidation Exercises 7-8 *Extension Exercises 9-11
4	☐ Revision ☐ Summative Exam (25% of Semester Grade)	**Summative Exam**

5	**Topic 2: Numerical Data**	
	☐ Calculate the mean, median, mode and range for numerical data sets ☐ Construct stem and leaf plots and dot plots	
6	☐ Identify potential outliers in a data set ☐ decide which measure of central tendency is most suitable for a particular data set, explain the reasoning behind the decision.	
7	**Topic 3: Probability**	
	☐ Identify the sample space in a single step experiment (eg: dice roll or coin flip) and represent the sample space using set notation eg. $S = \{1,2,3,4,5,6\}$ ☐ Use the formula $Probability\ of\ event = \frac{number\ of\ favourable\ outcomes}{total\ number\ of\ outcomes}$ to find the probability of single stage events. Eg $P(5) = \frac{1}{6},\ P(odd) = \frac{3}{6}$ ☐ Predict relative frequencies for events	
8	☐ Determine the sample space for single step experiments. For example: Determine the sample space for the roll of a 10 sided dice ☐ Make and test predictions about single step experiments. For example, predict how many even numbers you would expect to obtain from 100 rolls of a 6 sided die. ☐ Use technology (RanInt calculator function) to simulate multiple rolls of a dice with varying numbers of sides, record the results using tally marks and test predictions.	
9	☐ Consolidate learning from Topic 2 and Topic 3	
10	☐ Revision ☐ Summative Exam (25% of Semester Grade)	**Summative Exam**

Year 7 Maths
Term 3

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Assessment Details	
Type	Exam plus 4 Achievement Standard tests given periodically throughout term
Conditions	70 Minutes in class, Tech Active.
Date	Week 10

Achievement Standard

- They use all 4 operations in calculations involving positive fractions and decimals, choosing efficient calculation strategies.
- Students choose between equivalent representations of rational numbers and percentages to assist in calculations.
- They use mathematical modelling to solve practical problems involving rational numbers, percentages and ratios, in financial and other applied contexts, justifying choices of representation.

Week	**Curriculum Intent**	**Learning Advice**
1	**Topic 1: Fractions**	
	☐ Form equivalent fractions ☐ Use equivalent fractions to compare fractions ☐ Express a fraction in its simplest form ☐ Convert between mixed numbers and improper fractions ☐ Place mixed numbers on a number line	Booklet Ex 1-6
2	☐ Add and subtract fractions with the same denominators ☐ Add and subtract fractions with different denominators (with and without a calculator) ☐ Use mathematical modelling to solve word problems involving fraction addition, subtraction and comparison	Ex 7-11
3	☐ Multiply and divide fractions (with and without a calculator) ☐ Use fraction multiplication to find fractions of a quantity ☐ Use mathematical modelling to solve word problems involving fractions	Ex 12-15 **AS Test #1**
4	**Topic 2: Ratio**	
	☐ Understand ratio notation ☐ Represent quantities using ratios ☐ Divide quantities into given ratios ☐ Solve problems involving ratio	Ex 16-17 **AS Test #2**
5	Consolidation of all learning	
6	**Topic 3: Decimals and Percentages**	
	☐ Express percentages as fractions and fractions as percentages ☐ Know the following conversions: $\frac{1}{10}=10\%, \frac{1}{5}=20\%, \frac{3}{10}=30\%, \frac{2}{5}=40\%, \frac{1}{2}=50\%, \frac{3}{5}=60\%$, $\frac{7}{10}=70\%, \frac{4}{5}=80\%, \frac{9}{10}=90\%, \frac{1}{4}=25\%, \frac{3}{4}=75\%, \frac{1}{100}=1\%, 100\%=1$ ☐ Find a percentage of a quantity using fraction multiplication ☐ Understand $0.1=\frac{1}{10}$ and $0.01=\frac{1}{100}$. ☐ Place decimal values on a number line ☐ Convert decimals to simplest form fractions (and vice versa) without a calculator for the following: $0.1=\frac{1}{10}, 0.2=\frac{1}{5}, 0.3=\frac{3}{10}, 0.4=\frac{2}{5}, 0.5=\frac{1}{2}, 0.6=\frac{3}{5}, 0.7=\frac{7}{10}, 0.8=\frac{4}{5}, 0.9=\frac{9}{10}, 0.25=\frac{1}{4}, 0.75=\frac{3}{4}$	Ex 1-6 Ex 7-11

	☐ Convert fractions to decimals by dividing numerator by denominator (with calculator) ☐ Use a calculator S⇔D function to convert fractions to decimals and decimals to fractions	
7	☐ Use a calculator to add, subtract, multiply and divide decimals ☐ Round numbers to one or two decimal places ☐ Represent the following quantities as fractions, decimals and percentages without a calculator: $\frac{1}{10} = 0.1 = 10\%, \frac{1}{5} = 0.2 = 20\%, \frac{3}{10} = 0.3 = 30\%, \frac{2}{5} = 0.4 = 40\%, \frac{1}{2} = 0.5 = 50\%$, $\frac{3}{5} = 0.6\%$, $\frac{7}{10} = 0.7 = 70\%, \frac{4}{5} = 0.8 = 80\%, \frac{9}{10} = 0.9 = 90\%, \frac{1}{4} = 0.25 = 25\%, \frac{3}{4} = 0.75 = 75\%$.	Ex 12-14 **AS Test #3**
8	**Topic 4: Mathematical modelling using rational numbers**	
	☐ Use a calculator to find a percentage of a quantity using decimals: 16% of $50 = 0.16 \times 50 = 8$ ☐ Use a calculator to find a percentage increase and decrease ☐ Deciding on the best representation of a rational number (fraction, decimal, percentage, ratio) to solve a problem ☐ Finding efficient strategies to solve problems ☐ Deciding on an appropriate number of decimal places for different problems	Ex 15-17 **AS Test #4**
9	Revision of Topics 3 and 4	
10	**Summative Exam** (50% of Semester grade)	**Summative Exam**

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Year 7 Maths
Term 4

Assessment Details	
Type	2 Summative Exams
Conditions	60 Minutes in class, Tech Active.
Date	Week 5, Week 9.

Achievement Standard

- Students solve problems involving addition and subtraction of integers.
- Students use algebraic expressions to represent situations, describe the relationships between variables from authentic data and substitute values into formulas to determine unknown values.
- Students create tables of values related to algebraic expressions and formulas, and describe the effect of variation.
- They solve linear equations with natural number solutions.
- Students use coordinates to describe transformations of points in the plane.

Wk	Curriculum Intent	Learning Advice
1	**Topic 1: Addition and subtraction of integers**	
	☐ Placing integers and positive/negative fractions/decimals on the number line. ☐ Using the number line to add and subtract positive integers from positive or negative integers. eg: $5-6$, $-5+6$, $-5-6$ ☐ Adding and subtracting integers, eg: $4+-2, -4-+2$, $4--2$	Daily Quizzes Algebra Booklet Ex 1
2	**Topic 2: Algebra and Linear relationships**	
	☐ Understanding terms: Expression, Variables/pronumerals, Term, Coefficient ☐ Linking written descriptions with their algebraic equivalents ☐ Simplifying expressions by collecting like terms ☐ Substituting values into an algebraic expression	Algebra Booklet Ex 2-5
3	☐ Using the distributive law to expand brackets ☐ Creating tables of values related to algebraic expressions and formulas, and describe the effect of variation ☐ Creating tables of values for real life situations	Ex 6-9
4	☐ Plotting points on the Cartesian plane ☐ Plotting points on the Cartesian plane from a table of values ☐ Representing equations in the form $y=mx+c$ as lines on the Cartesian plane	Ex 10-13
5	☐ Revision of Topics 1 and 2 ☐ **Summative Exam on Topics 1-2** (25% of Semester grade)	**Summative Exam**
6	**Topic 3: Solving Linear Equations**	
	☐ Solving 1-step linear equations involving addition, subtraction & multiplication ☐ Solving two step linear equations, eg. $2x+5=23$	Equation booklet Ex 1-3
7	☐ Solving equations involving negative numbers ☐ Solving one and two step equations involving division	Ex 4-6
8	☐ Solving equations with variables on both sides ☐ Solving equation with brackets ☐ Solving multi-step equations ☐ Using algebraic techniques in mathematical modelling ☐ Describing transformations of points on the Cartesian plane	Ex 7-9 **Diagnostic Test #2**
9	☐ Consolidation ☐ **Summative Exam on Topic 3** (25% of Semester grade)	**Summative Exam**

Year 8 General Mathematics
Term 1

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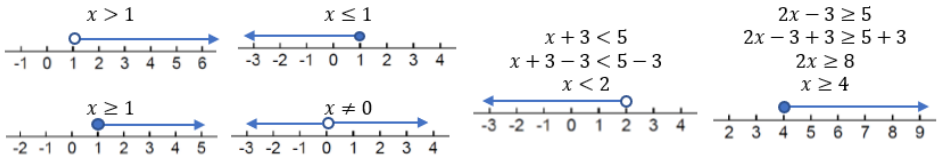
Assessment Details	
Type	Two Summative Exams
Conditions	60 Minutes in class, Tech Active.
Date	Week 6, Week 10

Achievement Standard

- Solve problems involving the four operations with integers
- Apply the exponent laws to calculations with numbers involving positive integer exponents
- Apply algebraic properties to rearrange, expand and factorise linear expressions
- Students solve linear equations with rational solutions and one-variable inequalities, graphically and algebraically.

Week	Curriculum Intent	Learning Advice
1	**Topic 1 – Integer Operations**	
	☐ Add and Subtract Integers (review from year 7) *eg.* $-3--2\,;\,-6+\,-4$ ☐ Multiplication with negative numbers ☐ Division with negative numbers	**Yr 8 Booklet #1** Exercises 1-3
2	**Topic 2 – Index Laws**	
	☐ Recall the vocabulary of index notation: 'base' and 'index' / 'exponent' / 'power' ☐ Recall that $5^3 = 5 \times 5 \times 5$ and convert expressions between index notation and expanded notation ☐ Use a calculator to find the value of expressions in index notation ☐ Apply the rules of integer multiplication to deduce that a negative number raised to an odd power will be negative, but when raised to an even power will be positive. ☐ Apply the first index law to numeric expressions: $a^m \times a^n = a^{m+n}$. "The bases are the same, we are multiplying the terms, so we add the indices." $5^6 \times 5^4 = 5^{10}$	Exercises 4-6
3	☐ Apply the second index law to numeric expressions: $a^m \div a^n = a^{m-n}$. "The bases are the same, we are dividing the terms, so we subtract the indices." $5^6 \div 5^4 = 5^2$ ☐ Apply the third index law to numeric expressions: $(a^m)^n = a^{m\times n}$. "Raising a power to a power, we multiply the indices" $(5^6)^2 = 5^{12}$ ☐ Apply the fourth index law to numeric expressions: $a^0 = 1$. "Anything to the power of zero is one" $5^0 = 1$ ☐ Simplify expressions combining index laws ☐ Extend the index laws to algebraic expressions*** [Extension]	Exercises 7-9 ***Exercise 10 Diagnostic Test
4	**Topic 3 – Algebra**	
	Simplify algebraic expressions involving the four operations ☐ Collect like terms to simplify expressions involving addition and subtraction. *eg.* $3a + 4b - a + c + 5b + 3$ ☐ Recall that x, x^2 and x^3 are not like terms and cannot be collected ☐ Simplify expressions involving multiplication and division of algebraic terms	Exercises 11-13
5	**Expand and factorise linear expressions** ☐ Expand brackets *eg.* $5(2x + 3) = 10x + 15,\ 5(2x - 3) = 10x - 15$ ☐ Expand brackets involving negatives *eg.* $-5(2x + 3), -5(2x - 3),\ -5(-2x + 3)$ *etc.* ☐ Factorise linear expressions *eg.* $10x + 15 = 5(2x + 3)$	Exercises 14-17 Exam revision video

6	**Revise Topics 1-3** ☐ Summative Exam	Exercises 18-19 **Summative Exam**
7	**Topic 4 – Linear Equations and Inequalities** **Solve linear equations** ☐ Solve one step linear equations, using inverse operations **For example:** $x+4=12$ → $x+4-4=12-4$ → $x=8$ $x-4=12$ → $x-4+4=12+4$ → $x=16$ $-4x=12$ → $\frac{-4x}{-4}=\frac{12}{-4}$ → $x=-3$ $\frac{x}{4}=12$ → $x=12\times 4$ → $x=48$ ☐ Solve two step linear equations using inverse operations. **For example:** $2x+3=11$ → $2x+3-3=11-3$ → $2x=8$ → $\frac{2x}{2}=\frac{8}{2}$ → $x=4$ $2x-3=11$ → $2x-3+3=11+3$ → $2x=14$ → $\frac{2x}{2}=\frac{14}{2}$ → $x=7$ $-2x+3=11$ → $-2x+3-3=11-3$ → $-2x=8$ → $\frac{-2x}{-2}=\frac{8}{-2}$ → $x=-4$ $8-2x=12$ → $8-2x-8=12-8$ → $-2x=4$ → $\frac{-2x}{-2}=\frac{4}{-2}$ → $x=-2$	**Yr 8 Booklet #2** Exercises 1-3
8	☐ Solve linear equations involving brackets. **For example:** $3(2x+5)=39$ → $6x+15=39$ → $6x+15-15=39-15$ → $6x=24$ → $\frac{6x}{6}=\frac{24}{6}$ → $x=4$ $-3(2x+5)=9$ → $-6x-15=9$ → $-6x-15+15=9+15$ → $-6x=24$ → $\frac{-6x}{-6}=\frac{24}{-6}$ → $x=-4$ $-3(2x-5)=9$ → $-6x+15=9$ → $-6x+15-15=9-15$ → $-6x=-6$ → $\frac{-6x}{-6}=\frac{-6}{-6}$ → $x=1$ $3(2x-5)=-9$ → $6x-15=-9$ → $6x-15+15=-9+15$ → $6x=6$ → $\frac{6x}{6}=\frac{6}{6}$ → $x=1$ ☐ Solve linear equations with non-integer solutions. **For example:** $2x+5=30$ → $2x+5-5=30-5$ → $2x=25$ → $\frac{2x}{2}=\frac{25}{2}$ → $x=12.5$ or $\frac{25}{2}$	Exercises 4-5 Wk 8 HW video Diagnostic Test
9	**Solve and graph linear inequations** ☐ Understand the inequality symbols $<$ Smaller than; $\leq$ Smaller than or equal to; $>$ Greater than; $\geq$ Greater than or equal to ☐ Use inverse operations to solve linear equalities algebraically. [Note: only use positive coefficients of x]. Graph the solution on a simple number line.  ☐ Solve more complex equations*** **Revise Topic 4**	Exercises 6-7*** Solving Equations: Exam Prep Video
10	☐ Summative Exam	**Summative Exam**

Year 8 General Maths
Term 2

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Assessment Details	
Type	Two Summative Exams
Conditions	50 Minutes in class, Tech Active.
Date	Week 6, Week 10

Achievement Standard

- Students recognise irrational numbers and terminating or recurring decimals.
- Students use appropriate metric units when solving measurement problems involving the perimeter and area of composite shapes, and volume of right prisms.
- Students use formulas to solve problems involving the area and circumference of circles.
- They use Pythagoras' theorem to solve measurement problems involving unknown lengths of right-angle triangles.
- They solve problems of duration involving 12- and 24-hour cycles across multiple time zones.

Week	Curriculum Intent	Learning Advice
1	**Topic 1: Measurement**	
	Preliminary Skills ☐ Rounding decimals to 1, 2 and 3 decimal places ☐ Converting units of measurement (linear) ☐ Identifying shapes (squares, rectangles, parallelograms, rhombuses, kites, circles) **Perimeter/Circumference** ☐ Recall that perimeter is the distance around the outside of a 2D shape. To find the perimeter of polygons, we add up the sides. ☐ Calculate the perimeters of parallelograms, rhombuses, kites and composite shapes including problems involving different units of measurement on different sides	Exercises 1-3 Exercises 4 Wk 1 HW video
2	☐ Recall that π is the ratio of a circle's circumference to its radius and identify π as an irrational number that has no exact decimal equivalent ☐ Identify the radius and diameter of a circle ☐ Calculate the circumference of a circle from radius/diameter measurement ☐ Solve perimeter problems involving composite shapes and circle segments	Exercise 5-7 Wk 2 HW video
3	**Area** ☐ Recall that area is the number of square units inside a 2D shape. ☐ Use formulas to find the areas of rectangles, triangles, parallelograms, rhombuses, kites, trapeziums and circles ☐ Find the area of composite shapes	Exercises 8-13 Wk 3 HW video
4	☐ Find the area of semi-circles, quarter-circles and composite shapes involving circles ☐ Solve complex problems involving area	Exercises 14-16 Wk 4 HW video
5	**Volume** ☐ Recall that volume as the number of cubes of space inside a 3D object ☐ Find the volume of rectangular prisms ☐ Use formulas to find the volume of triangular prisms ☐ Use the formula $Volume = area\ of\ face \times height$ to find the volume of a right prism ☐ Solve problems involving volume	Exercises 17-21 Wk 5 HW video
6	☐ Revision of topic 1 ☐ Summative Exam	Wk 6 HW video
7	**Topic 2: Pythagoras' Theorem**	
	☐ Correctly label a right-angled triangle's sides a, b and c. ☐ Use Pythagoras' Theorem $a^2 + b^2 = c^2$ to find the hypotenuse of a right angled triangle given the other two sides. ☐ Substitute into Pythagoras' theorem and then rearrange to find missing a or b sides of a right-angled triangle.	Exercises 1-5 **Diagnostic Quiz**

8	**Time** ☐ Convert between 12 and 24-hour time ☐ Solve problems of duration across multiple time zones.	Exercises 6-8 Wk 8 HW video
9-10	☐ Revision and Summative Exam	Wk 9 HW video **Summative Exam**

Year 8 Mathematics
Term 3

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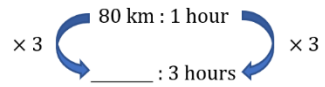
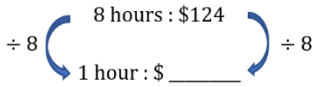
Assessment Details	
Type	3 Exams
Conditions	60 Minutes in class, tech active
Date	Week 5, Week 8, Week 10.

Achievement Standard

- Students solve problems involving the four operations with positive rational numbers.
- They use mathematical modelling to solve practical problems involving ratios, percentages and rates in measurement and financial contexts.
- Students represent the possible combinations of 2 events with tables and diagrams, and determine related probabilities to solve practical problems.
- They conduct experiments and simulations using digital tools to determine related probabilities of compound events.
- They conduct statistical investigations and explain the implications of obtaining data through sampling.
- Students analyse and describe the distribution of data. They compare the variation in distributions of random samples of the same and different size from a given population with respect to shape, measures of central tendency and range.

Week	Curriculum Intent	Learning Advice
1	**Topic 1: Rates, Ratios and Percentages**	
	☐ Perform fraction-decimal-percentage conversions for common fractions without technology: $\frac{1}{2}, \frac{1}{10}, \frac{1}{100}, \frac{3}{10}, \frac{7}{10}, \frac{9}{10}, \frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{1}{4}, \frac{3}{4}$. ☐ Recall that 0% of a quantity is 'none of it' and 100% of a quantity is 'all of it', ☐ Express percentages as decimals by dividing by 100 ☐ Find percentage of a value, by turning the percentage into a decimal and using the 'of means multiply' rule. **For example:** $38\% \text{ of } 80 = 0.38 \times 80 = 30.4$	Percentages, Rates and Ratio Booklet Exercises 1-5 Week 1 HW video
2	☐ Finding percentage *increase* or *decrease* in financial situations by calculating the percentage *of* a value and them adding or subtracting it from the original price. **For example:** A \$320 skateboard is increased in price by 15%. Find the new price. *Step 1*: $15\% \text{ of } \$320 = 0.15 \times 320 = \$48$ *Step 2*: $\$320 + \$48 = \$368$. New price is \$368. **For example:** A \$320 skateboard is reduced in price by 20%. Find the new price. *Step 1*: $20\% \text{ of } \$320 = 0.20 \times 320 = \$64$ *Step 2*: $\$320 - \$64 = \$256$. New price is \$256. ☐ Solve problems involving *profit* and *loss* **For example:** Sam bought a skateboard for \$350 and sold it to a friend, making a loss of 25%. Find how much his friend paid Sam for the skateboard. *Step 1*: $25\% \text{ of } \$350 = 0.25 \times 350 = \$87.50$ *Step 2*: $\$350 - 87.50 = \$262.50$. Sam's friend paid him \$262.50. **For example:** Sam bought a skateboard for \$350 and sold it to a friend, making a profit of 15%. Find how much his friend paid Sam for the skateboard. *Step 1*: $15\% \text{ of } \$350 = 0.15 \times 350 = \$52.50$ *Step 2*: $\$350 + \$52.50 = \$402.50$ Sam's friend paid him \$402.50.	Exercises 6-7 Exercises 8-9 Week 2 HW video
3	☐ Recognise equivalent ratios and express ratios in their simplest forms ☐ Divide quantities into given ratios, using counting strategies and fraction multiplication **For example:** Bob and Jack share 24 lollies in a ratio of 1:2. How many do they get each? *Step 1*: Add the two numbers that make up the ratios and make it the denominator of a fraction ($1 + 2 = 3$, so the denominator is 3). *Step 2*: Work out what fraction Bob gets by making the first number the numerator (Bob gets $\frac{1}{3}$). Work out what fraction Jack gets by making the second number the numerator (Jack gets $\frac{2}{3}$). *Step 3*: Use the 'of means multiply' rule to work out how much each person gets: Bob gets $\frac{1}{3}$ of $24 = \frac{1}{3} \times 24 = 8$ lollies. Jack gets $\frac{2}{3}$ of $24 = \frac{2}{3} \times 24 = 16$ lollies.	Exercises 10-11 **Diagnostic Test 1** Week 3 HW video

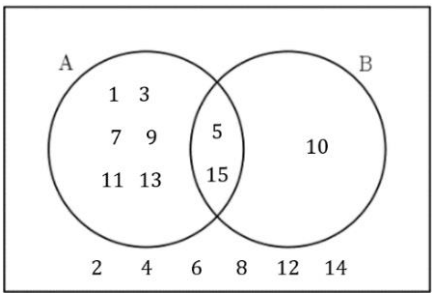
<table>
<tr>
<td>4</td>
<td>☐ Solve simple rate problems involving speed (km/hr) and earnings (dollars/hr) by making equivalent ratios.
Example 1: Jamie drive at a constant speed of 80km/hr. How far does he travel in 3 hours?
Example 2: Suzie worked for 8 hours on Saturday and earned $124. How much did she earn per hour?




$80 \times 3 = 240$. Jamie travels 240km. $124 \div 8 = 15.5$. Suzie earns $15.50 per hour
☐ Revision of topic 1</td>
<td>Exercises 12-13

Week 4 HW video</td>
</tr>
<tr>
<td>5</td>
<td>☐ Topic 1 Exam (First lesson of the week)
Topic 2: Probability
☐ Understand the language of probability: event, outcome, sample space
☐ List the sample space for simple experiments with equally likely outcomes
☐ Use the formula: $probablity = \frac{number\ of\ favourable\ outcomes}{total\ number\ of\ outcomes}$ to determine probabilities in simple experiments with equally likely outcomes
☐ Use the notation $P(A)$ to denote the probability of event A
For example: A 6 sided dice is rolled. Determine: a.) $P(odd)$ b.) $P(4)$
a.) There are a total of 6 possible outcomes and 3 winning outcomes (1,3,5), so $P(odd) = \frac{3}{6}$
b.) There are a total of 6 possible outcomes and 1 winning outcome, so $P(4) = \frac{1}{6}$</td>
<td>Topic 1
Summative Exam

Exercises 1-3</td>
</tr>
<tr>
<td>6</td>
<td>☐ Use a calculator [ALPHA // RanInt // RanInt#(1,6)] to simulate dice rolls and coin tosses [RanInt#(0,1)] and find the experimental probability of events.
☐ Understand the difference between theoretical probability and experimental probability: Theoretical Probability describes how likely an event is to occur. Experimental probability describes how frequently an event actually occurred in a particular experiment.
☐ Calculate the number of times that you expect a certain result from a repeated experiment and compare this to the actual result you get.
For example: A 6 sided die is rolled. $P(2) = \frac{1}{6}$. If I roll the dice 30 times, I would expect to get $\frac{1}{6} \times 30 = 5$ twos. When I rolled the die 30 times, I actually got 7 twos. This is 40% more than I expected. As I increase the number of die rolls, I would expect the proportion of 2s that I roll to get closer and close to $\frac{1}{6}$.
☐ Use two-way-tables to determine the sample space in simple two step experiments, then calculate probabilities
For example: A coin is flipped and a 6-sided die is rolled. Use a two-way table to determine the sample space and calculate: a.) $P(odd)$ b.) $P(Tails\ and\ even)$ c.) $P(Heads\ and\ 5)$ d.) $P(Heads\ or\ 5)$
<table>
<tr><td></td><td colspan="7">Die</td></tr>
<tr><td rowspan="3">Coin</td><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>H</td><td>H1</td><td>H2</td><td>H3</td><td>H4</td><td>H5</td><td>H6</td></tr>
<tr><td>T</td><td>T1</td><td>T2</td><td>T3</td><td>T4</td><td>T5</td><td>T6</td></tr>
</table>
a.) $P(odd) = \frac{6}{12}$ b.) $P(tails\ and\ even) = \frac{3}{12}$
c.) $P(heads\ and\ 5) = \frac{1}{12}$ d.) $P(heads\ or\ 5) = \frac{7}{12}$
☐ Use Venn diagrams to represent the union and intersection of 2 sets.</td>
<td>Exercises 4-5

Week 6 HW video</td>
</tr>
<tr>
<td>7</td>
<td>☐ Use Venn diagrams to model experiments


For example: A 15 sided die is rolled. Event A is rolling an odd number. Even B is rolling a multiple of 3.
Represent the situation in a Venn diagram and calculate:
a.) $P(A)$ b.) $P(B)$ c.) $P(A \cup B)$ d.) $P(A \cap B)$
Answers: a.) $P(A) = \frac{8}{15}$ b.) $P(B) = \frac{3}{15}$ c.) $P(A \cup B) = \frac{9}{15}$ d.) $P(A \cap B) = \frac{2}{15}$
☐ Use a calculator to simulate compound events and consider the similarities/differences between theoretical and experimental probabilities.</td>
<td>W7 HW Video</td>
</tr>
</table>

8	**Topic 3: Data**	
	☐ Recall calculation methods for range and the measures of centre (mean, median and mode.) ☐ Describe distributions in terms of their shape using the words symmetrical, left skewed and right skewed. Identify potential outliers on a histogram. ☐ Decide which measure of centre is best for a data set. ☐ Construct histograms for continuous data ☐ Understand the difference between a census and a sample when it comes to collecting data.	**Topic 2 Summative Exam**
9	☐ Revision of topics 2 and 3 ☐ Topics 2 and 3 Exam	
10	☐ Topic 3 Summative Exam (may be in week 1 Term 4 if extra time needed)	**Topic 3 Summative Exam**

Year 8 Mathematics
Term 4

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Assessment Details	
Type	2 Summative Exams
Conditions	70 Minutes in class, Tech Active.
Date	Week 6, Week 9/10

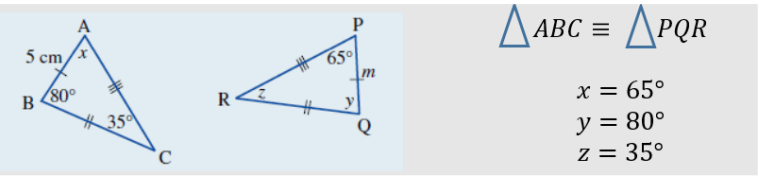
Achievement Standard

- They solve linear equations with rational solutions
- They graph linear relations
- They make and test conjectures involving linear relations using digital tools.
- Students use 3 dimensions to locate and describe position.
- They identify conditions for congruency and similarity in shapes and create and test algorithms designed to test for congruency and similarity.
- Students apply the properties of quadrilaterals to solve problems.

Week	**Curriculum Intent**	**Learning Advice**
Topic 1: Solving Linear Equations		
1	☐ Revise integer operations ☐ Solve one step linear equations, using inverse operations. **For example:** $x+4=12$ → $x+4-4=12-4$ → $x=8$ $x-4=12$ → $x-4+4=12+4$ → $x=16$ $-4x=12$ → $\frac{-4x}{-4}=\frac{12}{-4}$ → $x=-3$ $\frac{x}{4}=12$ → $x=12\times 4$ → $x=48$ ☐ Solve two step linear equations using inverse operations. **For example:** $2x+3=11$ → $2x+3-3=11-3$ → $2x=8$ → $\frac{2x}{2}=\frac{8}{2}$ → $x=4$ $2x-3=11$ → $2x-3+3=11+3$ → $2x=14$ → $\frac{2x}{2}=\frac{14}{2}$ → $x=7$ $-2x+3=11$ → $-2x+3-3=11-3$ → $-2x=8$ → $\frac{-2x}{-2}=\frac{8}{-2}$ → $x=-4$ $8-2x=12$ → $8-2x-8=12-8$ → $-2x=4$ → $\frac{-2x}{-2}=\frac{4}{-2}$ → $x=-2$ ☐ Solve linear equations involving brackets. **For example:** $3(2x+5)=39$ → $6x+15=39$ → $6x+15-15=39-15$ → $6x=24$ → $\frac{6x}{6}=\frac{24}{6}$ → $x=4$ $-3(2x+5)=9$ → $-6x-15=9$ → $-6x-15+15=9+15$ → $-6x=24$ → $\frac{-6x}{-6}=\frac{24}{-6}$ → $x=-4$ $-3(2x-5)=9$ → $-6x+15=9$ → $-6x+15-15=9-15$ → $-6x=-6$ → $\frac{-6x}{-6}=\frac{-6}{-6}$ → $x=1$ $3(2x-5)=-9$ → $6x-15=-9$ → $6x-15+15=-9+15$ → $6x=6$ → $\frac{6x}{6}=\frac{6}{6}$ → $x=1$ ☐ Solve linear equations with variables on both sides. **For example:** $5x+3=3x-6$	[This is revision from Term 1] Homework #1 Wk1 HW video
Topic 2: Graphing Linear Relations		
2	☐ Plot points on the Cartesian plane (revision) ☐ Understand the gradient as the slope of a line and the ratio of vertical to horizontal change. $Gradient=\frac{rise}{run}$. ☐ Find the gradient of lines and line segment using the formula $Gradient=\frac{rise}{run}$. ☐ Understand that a rising line has a positive gradient and a falling line has a negative gradient. ☐ Understand the m value in a linear equation in the form $y=mx+c$ as the line's gradient. ☐ Understand that the y-intercept of a line is the point where the line crosses the y-axis. ☐ Understand the c value in a linear equation in the form $y=mx+c$ as the line's y-intercept.	Homework #2 Wk2 HW video

3	☐ Graph linear relationships in the form $y = mx + c$ by first identifying the y-intercept, then applying the gradient. **For example**: Graph the line $y = -\frac{2x}{3} + 5$ • I first identify 5 as the y-intercept, an put a dot at the point (0,5). • I then see that the gradient is NEGATIVE, indicating a FALLING line. • I then start at the y-intercept and apply the gradient of $-\frac{2}{3}$ by taking 2 steps **down** and 3 steps across (to the right) and putting a dot. I then take another 2 steps down and 3 steps to the right and putting another dot. • Next I use a ruler to make a line through those 3 dots, extending the line to the bounds of the Cartesian plane, and putting arrows on the ends of the line. **For example:** Graph the line $y = \frac{2}{3}x + 1$ • I identify the y-intercept as 1, so put a dot at the point (0,1). • I then see that the gradient is POSITIVE, indicating a RISING line. • I then start at the y-intercept and apply the gradient of $\frac{2}{3}$ by taking 2 steps up and 3 steps across (to the right). I put a dot and then take another 2 steps up and 3 steps across to the right. • Next I use a ruler to make a straight line through the 3 dots, extending the line to the bounds of the Cartesian plane, and putting arrows on the ends of the line. ☐ Find the equations of straight lines by finding the gradient of the line (m) and its y-intercept (c) and substituting those values into the equation $y = mx + c$.	Homework #3 Wk3 HW Video

4	☐ Recognise that a co-ordinate pair will fall on a line if it satisfies the equation.
	For Example: Determine which of the following coordinate pairs falls on the line $y = 3x + 1$
	a.) $(5, 2)$
	If (5,2) falls on the line, it will satisfy $y = 3x + 1$.
	$x = 5, \quad y = 2$
	$y = 3x + 1$
	$2 = (3 \times 5) + 1$
	$2 = 16$
	Wrong, so (5,2) does not fall on the line $y = 3x + 1$
	b.) $(4, 13)$
	If (4,13) falls on the line, it will satisfy $y = 3x + 1$.
	$x = 4, \quad y = 13$
	$y = 3x + 1$
	$13 = (3 \times 4) + 1$
	$13 = 13$
	True, so (5,2) does fall on the line $y = 3x + 1$
		Homework #4
		Wk4 HW video

5	☐ Investigating linear relationships with digital tools	Homework #5-6 Wk5 HW video Wk6 HW video
6	☐ Revision of topics 1 and 2 ☐ Topic 1 and 2 Summative Exam	**Topics 1-2 Summative Exam**
7	**Topic 3: Congruency and Similarity** ☐ Identify congruent shapes as those that are identical in size and shape, recognising that the shapes may be flipped or rotated, but if cut out, would fit exactly on top of each other. ☐ Use congruency tests (SSS, SAS, ASA, RHS) to test pairs of triangles for congruency ☐ Find missing angles in congruent triangles  $\triangle ABC \equiv \triangle PQR$ $x = 65°$ $y = 80°$ $z = 35°$	Homework #7
8	☐ Identify similar shapes as those that are scaled versions of each other. ☐ Recognise that similar triangles have the same angles, and sides in proportion with one another ☐ Use triangle similarity tests (AAA, SSS, SAS, ASA, RHS) to test for similarity ☐ Find missing sides on similar triangles.	Homework #8
9	☐ Identify properties of quadrilaterals. **Square** – all sides equal in length, 4 right angles. **Rectangle** – opposite sides equal in length, 4 right angles. **Rhombus** – all sides equal in length, opposite angles equal. **Parallelogram** – opposite sides equal in length, opposite angles equal. **Trapezium** – one pair of sides are parallel. **Kite** – adjacent sides are equal in length, one pair of opposite angles are equal. ☐ Solve problems using properties of quadrilaterals.	Homework #9

	☐ Use three dimensions to locate and describe position	
10	Topic 3 summative exam.	**Topic 3 Summative Exam**

Year 9 General Mathematics
Term 1

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Assessment Details	
Type	Summative Exam
Conditions	70 minute exam, Calculator required.
Date	End of Week 9 or first lesson Week 10

Achievement Standard

- They extend and apply the exponent laws with positive integers to variables (and negatives with numbers).
- Students expand binomial products, and factorise monic quadratic expressions and solve monic quadratic equations with integer roots algebraically.
- Students express small and large numbers in scientific notation.
- They determine percentage errors in measurements.

Week	Curriculum Intent	Learning Advice
	Topic 1: Index Laws	
1	☐ Recall the vocabulary of index notation: 'base' and 'index' / 'exponent' / 'power' and the meaning of a^n as a multiplied by itself n times. ☐ Recall the first four index laws: • $a^m \times a^n = a^{m+n}$: "The bases are the same, we are multiplying the terms, so we add the indices" • $a^m \div a^n = a^{m-n}$. "The bases are the same, we are dividing the terms, so we subtract the indices." • $(a^m)^n = a^{m \times n}$. "Raising a power to a power, we multiply the indices" • $a^0 = 1$. "Anything to the power of zero is one" ☐ Apply the first four index laws to simple numeric and algebraic expressions. **For example**: $5^{12} \times 5^{10} = 5^{22}$, $\frac{5^{12}}{5^{10}} = 5^2$, $(5^{12})^{10} = 5^{120}$, $5^0 = 1$, $a^{12} \times a^{10} = a^{22}$	*Homework 1* *Video solutions*
2	☐ Apply the first 4 index laws to more complex algebraic expressions with one variable. **For example**: $\left(\frac{(a^5 \times a^3)^2}{(a^7 \div a^5)^3}\right)^3 \times \frac{(a^5)^2}{a^7}$ ☐ Recall the rules for multiplying algebraic terms with coefficients. **For example:** $3a \times 10a = 30a^2$, $10a^7 \div 2a^3 = 5a^4$ ☐ Recognise that when applying the 3rd index law (raising a power to a power), the power is applied to everything in the brackets, including coefficients. **For example**: $(3a^4b^5)^2 = 3^2 \times a^8 \times b^{10} = 9a^8b^{10}$ ☐ *Simplify complex algebraic expressions involving coefficients and multiple variables. **For example:** 1. $\frac{(a^5b^8)^2}{a^7b^3}$ 2. $\left(\frac{(2a^5b^{10} \times a^3b)^2}{(a^7b^2 \div a^5)^3}\right)^3$	*Complex content *Homework 2* *Video solutions*
3	☐ Establish the 5th index law: $a^{-m} = \frac{1}{a^m}$ "negative powers say 'flip'" and apply it to numeric and simple algebraic expressions. **For example**: $4^{-2} = \frac{1}{4^2} = \frac{1}{16}$, $a^{-5} = \frac{1}{a^5}$, $a^5 \times a^{-8} = a^{5+-8} = a^{-3} = \frac{1}{a^3}$ ☐ **Recognise that if a negative power is on the denominator of a term, it will move to the numerator. **For example:** $\frac{b^7}{3a^{-5}} = \frac{a^5b^7}{3}$ ☐ **Simplify complex algebraic expressions combining index laws. **For example:** $\frac{(2a^7b^{-2})^3}{4a^4b^{30}} \times \left(\frac{3a^3}{b^2}\right)^{-2}$	** Complex content beyond C level ACHIEVEMENT STANDARD TEST #1 *Homework 3* *Video solutions*

4	**Topic 2: Expanding, Factorising and Solving Quadratics** ☐ Expand simple binomial products **For example:** a.) $(3x+2)(5x+4)$ $= 15x^2+22x+8$ b.) $(2x-1)(x+3)$ $= 2x^2+5x-3$ ☐ **Expand more complex binomial products, applying index laws **For example:** $(3a^2-2b)(5ab^4+4b) = 15a^3b^4+12a^2b-10ab^5-8b^2$	*Homework 4* *Video Solutions* ACHIEVEMENT STANDARD TEST #2
5	☐ Factorise monic quadratic expressions with two terms **For example:** $x^2+4x=x(x+4)$, $a^2-8a=a(a-8)$	
6	☐ Understand the null factor law: When two things multiply together to give zero, one of the things must be equal to zero. ☐ Use the null factor law to solve simple quadratic equations in the form $x^2+ax=0$ **For example:** $a^2-6a=0$ $a(a-6)=0$ $a=0$ OR $a-6=0$ $a-6+6=0+6$ $a=6$ **For example:** $x^2+4x=0$ $x(x+4)=0$ $x=0$ OR $x+4=0$ $x+4-4=0-4$ $x=-4$	ACHIEVEMENT STANDARD TEST #3
7	**Topic 3: Scientific Notation and Percentage Error** ☐ Express small and large numbers in scientific notation ☐ Use the scientific notation mode on the calculator: SHIFT – SETUP – 7:SCI – 3 ☐ Determine percentage error in measurement caused by rounding. **For example**: A plant is 80cm when measured to the nearest centimetre. Find the percentage error. Because your measurement has been taken to the nearest cm, you could be up to 0.5cm incorrect. Percentage error $= \frac{maximum\ possible\ error}{measurment} \times 100$ Percentage error $= \frac{0.5}{80} \times 100 = 0.625\%$	NAPLAN
8	☐ Revision of Topics 1, 2 and 3	ACHIEVEMENT STANDARD TEST #4
9	☐ Revision of Topics 1, 2 and 3 **Summative Exam** – Final lesson of Week 9 or first lesson of Week 10	
10	☐ Preliminary skills for measurement unit: rounding, identifying shapes, substituting numbers into formulas, using the square root and power buttons on the calculator, recall meanings of area and perimeter.	

Year 9 General Mathematics
Term 2

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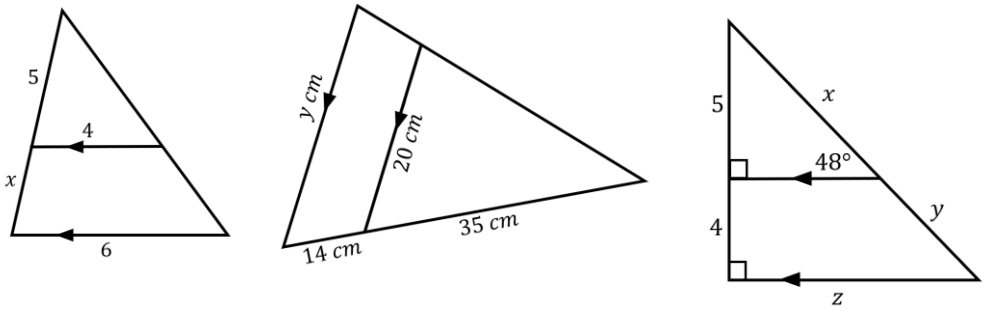
Assessment Details	
Type	Summative Exam
Conditions	70 minute exam, Calculator required.
Date	End of Week 9 or first lesson Week 10

Achievement Standard

- They apply formulas to solve problems involving the surface area and volume of right prisms and cylinders.
- Students recognise and use rational and irrational numbers to solve problems.
- Students apply Pythagoras' theorem and use trigonometric ratios to solve problems involving right-angled triangles.
- Students solve problems involving ratio, similarity and scale in two-dimensional situations.
- They apply the enlargement transformation to images of shapes and objects, and interpret results.
- Students design, use and test algorithms based on geometric constructions or theorems.
- They use mathematical modelling to solve practical problems involving direct proportion, ratio and scale, evaluating the model and communicating their methods and findings.

Week	Curriculum Intent	Learning Advice
1	**Topic 1: Measurement** ☐ Recall that the volume of a right prism can be found using the formula $V = Ah$, where A is the area of the base and h is the height of the prism. ☐ Find the volume of various right prisms, including those with rectangular, triangular and trapezoidal bases. ☐ Use the formula $V = \pi r^2 h$ to find the volume of a cylinder	
2	☐ Define surface area as the total area of the surfaces of a 3D object ☐ Draw nets of prisms and cylinders ☐ Use the formula $SA = 2\pi r^2 + 2\pi rh$ to find the surface area of a cylinder ☐ Use the formula $SA = 2LW + 2WH + 2LH$ to find the surface area of a rectangular prism ☐ Find the surface area of triangular and trapezoidal prisms where all of the side lengths are given by adding together the areas of each face.	
3	☐ Solve problems involving the volume and surface area of right prisms and cylinders	
4	**Topic 2: Right Angled Triangles** ☐ Label the sides of a right angled triangle as a, b and c where a and b are the two shorter sides (adjacent to the right angle) and c is the hypotenuse. ☐ Use Pythagoras' Theorem $a^2 + b^2 = c^2$ to find the length of unknown sides on a right angled triangle ☐ Use Pythagoras' theorem to find unknown sides of a triangular prism and then find the surface area or volume of the prism.	
5	☐ Label the sides of a right angled triangle 'opposite' or 'adjacent' according to their relationship with an identified angle θ. Also label the hypotenuse. ☐ Understand that in a right angled triangle, all angles of θ degrees will have the same ratio between 1.) their opposite side and hypotenuse (called the *sine* ratio (pronounced 'sign')), 2.) their adjacent side and hypotenuse (called the cosine ratio), 3.) their opposite and adjacent sides (called the tangent ratio).	

	$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$ ☐ Use the trigonometric ratios to find missing sides on a right angled triangle	
6	☐ Use Pythagoras' theorem and/or the trigonometric ratios to find missing sides in right angled triangles. ☐ Solve surface area and volume problems of triangular prisms where Pythagoras' theorem and/or the trigonometric ratios need to be first used to find missing sides	
7	**Topic 3: Similar triangles, ratio and scale** ☐ Define similar triangles as those which are scaled versions of each other. Their angles are the same and their sides are in proportion. ☐ Test triangles for similarity using the AAA, SSS or SAS test: ☐ Find the scale factor between similar triangles. ☐ Find missing side lengths in similar triangles.	
8	☐ Solve complex problems involving similarity and scale in two dimensional situations. For example, find the missing sides in these triangles: 	
9-10	☐ Revision of Topics 1, 2 and 3 **Summative Exam** – Final lesson of Week 9 or first lesson of Week 10	

Test		Explanation
AAA	Angle – Angle – Angle	All corresponding angles are equal in size
SSS	Side – Side – Side	All corresponding sides are in proportion
SAS	Side – Angle – Side	Two corresponding sides are in proportion and the included angle are equal
RHS	Right angle – Hypotenuse - Side	They both have a right angle and the hypotenuses and another pair of sides are in proportion.

Year 9 General Mathematics
Term 3

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Assessment Details	
Type	Summative Exam
Conditions	70 minute exam, Calculator required.
Date	End of Week 9 or first lesson Week 10

Achievement Standard

- They find the distance between 2 points on the Cartesian plane, and the gradient and midpoint of a line segment.
- Students use mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear and quadratic functions.
- They graph quadratic functions
- Students describe the effects of variation of parameters on functions and relations, using digital tools, and make connections between their graphical and algebraic representations.

Week	Curriculum Intent	Learning Advice
1	**Topic 1: Linear Functions on the Cartesian Plane**	
	☐ Understand the gradient as the slope of a line and the ratio of vertical to horizontal change. $Gradient = m = \frac{rise}{run}$.	Exercises 1-3
	☐ Understand that a rising line has a positive gradient and a falling line has a negative gradient.	
	☐ Understand the m value in a linear equation in the form $y = mx + c$ as the line's gradient and c as the line's y-intercept.	
	☐ Graph linear relationships in the form $y = mx + c$ by first identifying the y-intercept, then applying the gradient.	
	For example: Graph the line $y = -\frac{2x}{3} + 5$ • I first identify 5 as the y-intercept, and put a dot at the point (0,5). • I then see that the gradient is NEGATIVE, indicating a FALLING line. • I then start at the y-intercept and apply the gradient of $-\frac{2}{3}$ by taking 2 steps **down** and 3 steps across (to the right) and putting a dot. I then take another 2 steps down and 3 steps to the right and putting another dot. • Next I use a ruler to make a line through those 3 dots, extending the line to the bounds of the Cartesian plane, and putting arrows on the ends of the line.	
	For example: Graph the line $y = \frac{2}{3}x + 1$ • I identify the y-intercept as 1, so put a dot at the point (0,1). • I then see that the gradient is POSITIVE, indicating a RISING line. • I then start at the y-intercept and apply the gradient of $\frac{2}{3}$ by taking 2 steps up and 3 steps across (to the right). I put a dot and then take another 2 steps up and 3 steps across to the right. • Next I use a ruler to make a straight line through the 3 dots, extending the line to the bounds of the Cartesian plane, and putting arrows on the ends of the line.	
	☐ Find the equations of straight lines by finding the gradient of the line and its y-intercept and substituting those values into the equation $y = mx + c$.	
	☐ Recognise that a co-ordinate pair will fall on a line if it satisfies the equation.	

	For Example: Determine which of the following coordinate pairs falls on the line $y = 3x + 1$
	a.) $(5, 2)$
	If (5,2) falls on the line, it will satisfy $y = 3x + 1$.
	$x = 5, \quad y = 2$
	$y = 3x + 1$
	$2 = (3 \times 5) + 1$
	$2 \neq 16$
	So (5,2) does not fall on the line $y = 3x + 1$
	b.) $(4, 13)$
	If (4,13) falls on the line, it will satisfy $y = 3x + 1$.
	$x = 4, \quad y = 13$
	$y = 3x + 1$
	$13 = (3 \times 4) + 1$
	$13 = 13$
	True, so (5,2) does fall on the line $y = 3x + 1$	

2	☐ Use Desmos to observe the changes that altering the m and c values make to a line in $y = mx + c$ form. ☐ Without graphing a linear function, describe it in terms of its y-intercept, whether it is rising or falling, with a steeper or gentler slope than $y = x$. ☐ Recognise that lines with the same gradient will be parallel. ☐ Compare lines by considering the parameters m and c in their $y = mx + c$ equations. **Example 1:** The linear function $y = x - 5$ is transformed to become $y = 2x - 5$. Explain how the new line will look different to the original line. • *The original line had a gradient of 1 and a y-intercept of -5. The new line has the same y-intercept but its gradient has been changed to 2 so it will be steeper.* **Example 2:** The linear function $y = 2x + 3$ is transformed to become $y = -2x + 3$. Explain how the new line will look different to the original line. • *The original line was rising with a gradient of positive 2. The new line has a gradient of negative 2 so it will be falling. The y-intercepts haven't changed.* **Example 3:** The linear function $y = 3x + 1$ is transformed to become $y = 3x + 2$. Explain how the new line will look different to the original line. • *The lines have the same gradient so they will be parallel to one another. The first line has a y-intercept of 1 and the second line has a y-intercept of 2, so the second line will be one unit higher than the first.*	Exercise 4
3	☐ Find the gradient of a line segment using the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$ ☐ Find the distance between two point on the Cartesian plane using the formula: $distance = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ ☐ Find the midpoint of a line segment using the formula: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$	Exercises 5-8
4	**Topic 2: Quadratic Functions on the Cartesian Plane** ☐ Recognise that quadratic equations (those with x^2) create parabolas. ☐ Recognise the basic parabola $y = x^2$ as having a 'smiling' shape and turning point at (0,0). ☐ Use a table of values to sketch the parabolas $y = x^2$ and $y = -x^2$. ☐ Recognise that transformations can be applied to this parabola. It can be reflected over the x-axis (giving it a 'frowning' shape), it can be widened or narrowed, and it can be moved to the left or right and up or down. ☐ Understand the turning point form of the quadratic equation $y = a(x - h)^2 + k$. The positive or negative sign of the a value determines whether the parabola will be 'smiling' or 'frowning'. The numeric a value widens or narrows the parabola, the h value translates the parabola horizontally and the k value translates it vertically. ☐ Write the equations for given parabolas (with an a value of 1 or -1) using turning point form.	Video: Finding the equations for parabolas in turning point form Exercises 9-10
5	☐ Use Desmos to observe the changes that altering the a, h and k values make to a parabola in $y = a(x - h)^2 + k$ form. ☐ Without graphing a parabola, describe it in terms of its shape (whether it is 'smiling' or 'frowning'), whether it is wide or narrow, and the co-ordinates of its turning point. ☐ Compare parabolas by considering the parameters a, h and k in their $y = a(x - h)^2 + k$ equations. **Example 1:** The parabola $y = (x - 2)^2 + 5$ is transformed to become $y = (x - 3)^2 + 4$. Explain how the new parabola will look different to the original parabola. • *The original parabola is 'smiling' with a turning point at (2,5). The new parabola has a turning point at (3,4) so it has been shifted to the right by one and down by 2. It is also 'smiling'. The old and new parabolas have the same width.* **Example 2:** The parabola $y = (x + 4)^2 - 6$ is transformed to become $y = -2(x + 4)^2 - 6$. Explain how the new parabola will look different to the original parabola. • *The two parabolas have the same turning point $(-4, -6)$. The first is smiling but the second is frowning. The second is more narrow than the first.*	Exercise 11

	Topic 3: Simple Interest	
6	☐ Calculate percentage of a quantity **For example:** Find 5% of \$240. **STEP 1:** Convert 5% into a decimal by dividing by 100. $5\% = 0.05$ **STEP 2:** 'Of' means multiply. 5% of \$240 means $0.05 \times \$240 = \$12$ ☐ Understand that it costs money to borrow money. Banks do not lend money for free. They charge 'interest' on a loan. ☐ Understand that the 'interest rate' is the percentage of the money that we borrow that we must pay back to the bank (every year) in addition to the money that we owe. For example, if we borrow \$100 and the interest rate is 10%, at the end of that year, we owe the bank the \$100 that we borrowed, plus an additional 10% of \$100, that is, an additional \$10. ☐ Understand that when we save our money in the bank or another investment account, the bank pays us interest. ☐ Use the formula $I = PiN$ to calculate the interest owed on loans or earned on an investment, where $I =$ interest owed/earned, $P =$ principle (the amount borrowed or invested), $i =$ interest rate per time period as a decimal, $n =$ number of time periods.	Exercise 12-13
7	☐ Solve problems involving simple interest using the formulas $I = Pin$ and $Amount\ owing = P + i$ ***Simple Familiar:*** **For example:** Jason took out a simple interest loan of \$5000 at an interest rate of 8% per annum. He made no repayments for 10 years. Calculate the amount of interest that the bank will charge and the total amount owing after 10 years. **Answer:** $P = \$5000,\ i = 8\% = 0.08, n = 10.$ $I = Pin$ — $A = P + I$ $I = 5000 \times 0.08 \times 10$ — $A = \$5000 + 4000 = \$9000$ $I = \$4000$ — After 10 years, Jason is charged \$4000 interest and now owes \$9000. **For example:** Jacob saved up \$3500 and placed it in an account earning 9% interest per annum for 12 years. How much interest has he earned in that time and how much money does he have at the end of the 12 years? **Answer:** $P = \$3500,\ i = 9\% = 0.09, n = 12.$ $I = Pin$ — $A = P + I$ $I = 3500 \times 0.09 \times 12$ — $A = \$3500 + 3780 = \$7280$ $I = \$3780$ — After 12 years, Jacob has earned \$3780 in interest and now has \$7280. ***Complex Familiar*** **For example:** Lucy saved up x dollars and placed it in an account earning 7% interest per annum for 20 years. In that 20 years she earned \$9100 in interest. Determine how much money she invested. **Answer:** $P = x,\ i = 7\% = 0.07, n = 20,\ I = \$9100.$ $I = Pin$ $9100 = x \times 0.07 \times 20$ $9100 = 1.4x$ $x = \frac{9100}{1.4}$ — Lucy invested \$6500 $x = \$6500$	Exercise 14
8	☐ Consolidation and revision of Topics 1, 2 and 3	
9	☐ Consolidation and revision of Topics 1, 2 and 3	
10	**Summative Exam** – Final lesson of Week 9 or first lesson of Week 10	

Year 9 General Mathematics
Term 4

Trinity Bay SHS
Hoare Street
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Phone: 40375222
www.trinitybayshs.eq.edu.au

Assessment Details	
Type	2 Summative Exam
Conditions	70 minute exams, Calculator required.
Date	Week 5, Week 9.

Achievement Standard

- They compare and analyse the distributions of multiple numerical data sets, choose representations, describe features of these data sets using summary statistics and the shape of distributions, and consider the effect of outliers.
- Students explain how sampling techniques and representation can be used to support or question conclusions or to promote a point of view.
- They determine sets of outcomes for compound events and represent these in various ways.
- Students assign probabilities to the outcomes of compound events.
- They design and conduct experiments or simulations for combined events using digital tools.

Week	Curriculum Intent	Learning Advice
	Topic 1: Data Analysis	
1	☐ Calculate mean, median and mode of numerical data sets with and without calculator functions. ☐ Understand that mean, median and mode as **measures of centre** in a dataset ☐ Use the formula: $range = highest\ value - lowest\ value$, to calculate the range of a data set and understand range as a **measure of spread**.	
2	☐ Represent discrete numeric data with a reasonably small range in a **dot plot** ☐ Represent discrete numeric data with a larger range in a **stem and leaf plot** ☐ Represent continuous numeric data in a **histogram** ☐ Chose an appropriate visual display for a numeric data set	
3	☐ Describe the **shape of a distribution** as symmetrical, positively skewed, negatively skewed, or bimodal ☐ Understand that **outliers** are extreme values in data sets ☐ Identify outliers in data sets and recognise that outliers can greatly affect the mean ☐ Choose the best measure of centre for a data set, recognising for that a data set that has a significant skew and/or outliers, the median can be a better choice. ☐ Write a paragraph analysing the distribution of a numeric data set, considering its shape, centre and spread, discussing the presence of outliers (if applicable) and including an appropriate graphical display. **For example:** 20 people were asked how many books they read last summer. Analyse the data and write a paragraph answering the question "Around how many books did people read last summer."  *Twenty people were asked how many books they read last summer. Responses given were between 0 and 9, so the range of the data is 9. There are no outliers. The mean is 2.6, the median is 1.5 and the mode is 1. As can be seen on the dot plot, the distribution has a strong positive skew. Because of the positive skew, the mean is higher than the median and the median is probably the best measure of centre. To answer the question, 'How many books did people read last summer?" I would say that people read between zero and nine books, but general around 1.5.*	

4	☐ Write a paragraph comparing the distributions of two data sets, considering their shapes, centres and spreads, the presence of outliers (if applicable) and including appropriate graphical displays. Times Social Media is Checked Men | Women 9 8 7 7 | 0 | 4 7 8 9 8 7 5 5 4 | 1 | 0 5 8 5 5 0 | 2 | 8 8 8 8 9 1 0 | 3 | 0 7 9 | 4 | 5 8 | 5 | 0 | 6 | **For example:** Write a paragraph comparing how many times per day men and women check social media *15 men and 17 women were asked how many times per day they checked social media. The distribution of the men is positively skewed, with a range of 53, a mean of 20, and a median of 17. The range and mean are affected by an outlier at the high end. Without this outlier, the range would be 24. Because of the skew and outlier, the median is the best measure of centre for the men's data. The female distribution is more symmetrical with a mean of 24, a mode and median of 28, and a range of 44. Overall, this data indicates that women check their social media more often than men.*	
5	☐ Explain how sampling techniques can be used to support or question conclusions or to promote a point of view ☐ Understand the pros and cons of different sampling techniques, including random samples, stratified samples, convenience samples, biased samples ☐ **Summative Exam** –Week 5	
6	**Topic 2: Probability** ☐ Understand the language of probability: event, outcome, sample space ☐ Use the formula: $probablity = \frac{number\ of\ favourable\ outcomes}{total\ number\ of\ outcomes}$ to determine probabilities in simple experiments with equally likely outcomes ☐ Use two-way-tables to determine the sample space in simple two step experiments, then calculate probabilities **For example:** A coin is flipped and a 6-sided die is rolled. Use a two-way table to determine the sample space and calculate the probability of getting: a.) an odd number b.) tails and an even number c.) Heads or a 5 d.) Heads or a 5 Die: 1 2 3 4 5 6 Coin H: H1 H2 H3 H4 H5 H6 Coin T: T1 T2 T3 T4 T5 T6 a.) $P(odd) = \frac{6}{12}$ b.) $P(tails\ and\ even) = \frac{3}{12}$ c.) $P(heads\ and\ 5) = \frac{1}{12}$ d.) $P(heads\ or\ 5) = \frac{7}{12}$	
7-8	☐ Understand the multiplication principal that if the $P(A) = 0.4$ and $P(B) = 0.5$ the probability of both A and B happening is $P(A) \times P(B) = 0.4 \times 0.5 = 0.2$ ☐ Use tree diagrams to list outcomes for multi-step chance experiments (up to 3 levels) and use the multiplication principal to assign probabilities to each outcome. **Example 1 (Simple Familiar):** A coin is flipped twice. Draw a tree diagram and calculate the probability of getting a.) two heads, b.) at least one head. Multiply 0.5 Head 0.5 Tail 0.5 Head 0.5 Tail 0.5 Head 0.5 Tail Head, Head ----> 0.5 × 0.5 = 0.25 Head, Tail ----> 0.5 × 0.5 = 0.25 Tail, Head ----> 0.5 × 0.5 = 0.25 Tail, Tail ----> 0.5 × 0.5 = 0.25 Add 1.00 **Answer:** a.) $P(2\ heads) = 0.25$ b.) $P(at\ least\ 1\ head) = 0.25 + 0.25 + 0.25 = 0.75$ **Example 2 (Complex):** You are off to play soccer and love being the goalkeeper. Whether you get to be goalkeeper depends on who the coach. With coach Sam, the probability of being goalkeeper is 0.5. With Coach Alex. The probability of being Goalkeeper is 0.3. Sam is coach more often and there is a 60% chance that he will be coach today. Draw a tree diagram and calculate the probability that you will be goalkeeper today. 0.6 Sam 0.4 Alex 0.5 Yes ----> 0.6 × 0.5 = 0.3 0.5 No ----> 0.6 × 0.5 = 0.3 0.3 Yes ----> 0.4 × 0.3 = 0.12 0.7 No ----> 0.4 × 0.7 = 0.28 **Answer:** $P(being\ goalkeeper) = 0.3 + 0.12 = 0.42$	
9-10	☐ Revision of Topic 2 **Summative Exam** –Week 9	

Year 10 General Mathematics
Term 1

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Assessment Details	
Type	Summative Exam
Conditions	70 minute exam, Calculator required.
Date	Week 9

Achievement Standard

- They find unknown values after substitution into formulas.
- They perform the four operations with simple algebraic fractions.
- Students solve pairs of simultaneous equations.
- They solve problems involving linear equations and inequalities.
- Students expand binomial expressions and factorise monic quadratic expressions.

Week	Curriculum Intent	Learning Advice
	Topic 1: Linear Equations and Inequalities	
1	☐ Review solving linear equations, including those with brackets and pronumerals on both sides **For example**: $5x - 28 = 21$, $6(3x - 5) = 56$, $\frac{3k}{5} = 15$, $3r + 13 = 2(r - 5)$	Jac : 2.5 Q1-6, 13-18 Cam : 1B Q1-5, 13
2	☐ Substitute values into a formula to determine an unknown value. **For example**: a.) $F = \frac{9c}{5} + 32$. Find the value of c when $F = 18$. b.) $s = ut + \frac{1}{2}at^2$. Find the value of u when $t = 1$, $a = 10$ and $s = 13$	Jac: 2.2 (simple), 2.5 Q40-44 Cam : 1B Q7-12 Solving Eq Video
3	☐ Simplify expressions involving algebraic fractions **For example:** $\frac{5}{x} + \frac{3}{x}$, $\frac{x}{5} - \frac{3x}{5}$, $\frac{3x}{2} + \frac{4x}{5}$, $\frac{x+1}{2} - \frac{x}{3}$, $\frac{5}{3x} + \frac{1}{x}$, $\frac{3x}{5} \times \frac{x}{2}$ ☐ Solve linear equations involving simple algebraic fractions. **For example:** $\frac{x}{3} + \frac{4x}{5} = \frac{1}{3}$, $\frac{x+1}{2} = \frac{x+3}{3}$, $\frac{2(5x-1)}{7} = 12$	Jac : 2.3 Q1-10 2.4 Q1-3, 7 2.6 1-11 (complex) Cam : 1B, Q6, 5D 1D (complex) Simp Alg Fractions vid Solving Alg Fractions
4	☐ Solve linear inequalities. Graph the solution on a number line. **For example:** $5x + 15 < 25$, $5x + 15 - 15 < 25 - 15$, $5x < 10$, $x < 2$; $2x - 3 \geq 5$, $2x - 3 + 3 \geq 5 + 3$, $2x \geq 8$, $x \geq 4$; $-2x + 4 \geq 2$, $-2x + 4 - 4 \geq 2 - 4$, $-2x \geq -2$, $x \leq 1$	Jac : 4.7 Q1-17 Cam : 1C Linear Inequalities video
5	☐ Use substitution or elimination methods to solve simultaneous equations **For example:** a.) $\begin{cases} y = 2x + 5 \\ y = -x - 4 \end{cases}$ b.) $\begin{cases} 2x + y = 3 \\ x - y = 6 \end{cases}$	Jac : 4.3 Q1-6 4.4 Q1-9 Cam : 1L, 1J Substitution video Elimination video
6	☐ Solve word problems using simultaneous equations **For example:** a.) The sum of two numbers is 1633. Their difference is 35. Find the numbers. b.) The cost of one apple and one banana is $1 and the cost of 3 apples and 2 bananas is $2.40. Find the cost of a single banana.	Jac: 4.6 Q1-16 Cam: 1K SE Word Problems Video
7	**Topic 2: Expand and Factorise Quadratic Expression**	
	☐ Expand binomial products **For example:** a.) $(3x + 2)(5x + 4) = 15x^2 + 22x + 8$ b.) $(2x - 1)(x + 3) = 2x^2 + 5x - 3$ ☐ Factorise monic quadratic expressions **For example:** $x^2 + 5x + 6$	Jac : 7.2 Q1-20 7.3 Q1-9 Cam : 5A, 5B
8	☐ Revision of Topic 1 and Topic 2	
9	☐ **Summative Exam**	

Year 10 General Mathematics
Term 2

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Assessment Details	
Type	Summative Exam
Conditions	70 minute exam, Calculator required.
Date	Week 9

Achievement Standard

- They recognise the connection between simple and compound interest
- Find unknown values after substitution into a formula
- Solve surface area and volume problems relating to composite solids
- Use trigonometry to calculate unknown angles in right-angled triangles
- Use triangle and angle properties to prove congruence and similarity

Week	Curriculum Intent	Learning Advice
	Topic 1: Simple and Compound Interest	
1	☐ Calculate simple interest using the formula $I = Pin$ **For example**: $25000 is invested in an account earning simple interest of 5% p.a. a.) Find the total interest earned after 8 years. b.) Find the value of the investment after 8 years. ☐ Calculate compound interest using the formula $A = P(1 + i)^n$ **For example:** Jake takes out a loan of $8000 from a bank charging 7% interest per annum compounding quarterly. Calculate the amount he would owe after 3 years if he makes no repayments.	Year 9 Jac : 1.9 Cam : 3H
2	☐ Link compound interest to repeated applications of simple interest ☐ Solve unknown value problems involving simple and compound interest **For example:** a.) $4000 is invested in a simple interest earning account. After 8 years, $640 has been earned in interest. Find the interest rate per annum. b.) A certain amount of money is invested in an account earning 6% interest per year, compounding annually. After 5 years, the investment is worth $5687.46. Find the amount that was invested. (Complex)	Jac: 1.9, worked example 24 Cam: 3H
3	**Topic 2: Surface Area and Volume** ☐ Calculate the volume of right prisms, cylinders and spheres. ☐ Calculate the volumes of composite solids made up of right prisms and cylinders	Jac : 6.4 Cam : 4K
4	☐ Calculate the surface area of right prisms, cylinders and spheres. ☐ Calculate the surface areas of composite solids made up of right prisms and cylinders ☐ Solve missing side problems given the volume/surface area and other dimensions of right prisms, cylinders and spheres.	Jac : 6.3 Cam: 4I
5	**Topic 3: Trigonometry** ☐ Recall the three trigonometric ratios: sine (sin), cosine (cos) and tangent (tan) ☐ Use the trigonometric ratios to calculate missing side lengths on right angled triangles	Jac : 5.4, 5.5 Cam : 6A
6	☐ Calculate missing angles in right angled triangles by using the inverse trigonometric ratios ☐ Use trigonometric ratios to solve a range of problems including those involving angles of elevation and depression	Jac: 5.6, 5.7 Cam: 6B, 6C, 6D
7	☐ Solve problems involving similarity	Jac: 10.3 Cam: 2B, 2C
8	☐ Revision of Topics 1, 2 and 3.	
9	☐ **Summative Exam**	

Year 10 General Mathematics
Term 3

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Assessment Details	
Type	Summative Exam
Conditions	70 minute exam, Calculator required.
Date	Week 9

Achievement Standard

- They solve problems involving linear equations
- The solve pairs of simultaneous equations
- They make the connections between algebraic and graphical representations of relations.
- They recognise the relationships between parallel and perpendicular lines.
- Students list outcomes for multi-step chance experiments and assign probabilities for these experiments.

Week	**Curriculum Intent**	**Learning Advice**
	Topic 1: Linear equations and relationships	
1	☐ Recall that equations in the form $y = mx + c$, are linear equations. They make straight lines and the m value is the gradient of the line and the c value is the y-intercept. ☐ Recall that the gradient of the line is the ratio of its vertical to its horizontal change: $m = \frac{rise}{run}$. Recall that given two points on a line (x_1, y_1) and (x_2, y_2) you can calculate the gradient using the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$. ☐ Recall that a negative gradient indicates a falling line and a positive gradient indicates a rising line. ☐ Sketch linear relationships in the form $y = mx + c$ by first identifying the y-intercept, then applying the gradient. **For example**: To sketch the line $y = -\frac{2x}{3} + 5$ I would first identify 5 as the y-intercept, so put a dot at the point (0,5). I would then apply the gradient of $-\frac{2}{3}$ by taking 2 steps down and 3 steps across (to the right) and putting a dot. I would then take another 2 steps down and 3 steps to the right and putting another dot. I would then use a ruler to make a line through those 3 dots, extending to the bounds of the Cartesian plane, and putting arrows on the ends of the line. ☐ Find the equations of straight lines by finding the gradient of the line (m) and its y-intercept (c) and substituting those values into the equation $y = mx + c$.	**Cambridge** 1E – Graphing Straight lines Q1-4 Video: sketching lines
2	☐ Find the equation of a line given its gradient and y-intercept, its gradient and one other point on the line or two points on the line ☐ Understand parallel lines as lines which have the same gradient ☐ Understand perpendicular lines as those whose gradients multiply to give -1. ☐ Find the gradient of a line perpendicular to a given line by 'flipping' the gradient and changing the sign. ☐ Find the equation of a line parallel or perpendicular to a given line, passing through a particular point. **For example:** Find the equation of a line perpendicular to $y = -2x + 5$, that passes through the point (4,3). Answer: The gradient of the given line is -2, so the gradient of my new line will be $+\frac{1}{2}$. I substitute this m value $y = mx + c$ and it become $y = \frac{1}{2}x + c$. The line must pass through the point (4,3) so I substitute these x and y values into the equation: $3 = \frac{1}{2} \times 4 + c$ and I solve this equation to get $c = -1$. My equation is therefore $y = \frac{1}{2}x - 1$.	1F – Finding the equation of a line Q 1-3, 8, 9 1H – Parallel & perpendicular lines Q1-4

<table>
<tr><td>3</td><td>☐ Recall solving simultaneous equations using the substitution/elimination methods
☐ Solve simultaneous equation when both equations are in the form $y = mx + c$
For example: Solve the simultaneous equation $y = 5x + 2$ and $y = 3x - 4$.
Answer: If y equals 'this' and y equals 'that' then 'this' must equal 'that', so
$5x + 2 = 3x - 4$
$5x + 2 - 3x = 3x - 4 - 3x$
$2x + 2 = -4$
$2x + 2 - 2 = -4 - 2$
$2x = -6$
$x = -3$
When $x = -3$, $y = 5x + 2$
$y = (5 \times -3) + 2$
$y = -15 + 2$
$y = -13$
The solution is $x = -3,\ y = -13$
☐ Use simultaneous equations to find the point where two lines intersect. Check answers by sketching the lines.</td><td>1I – Solving simultaneous equations using substitution Q1-2 (plus teacher resources for SE in form $y = mx + c$)
Video: intersecting lines</td></tr>
<tr><td>4</td><td>Topic 2: Equations of parabolas and circles
☐ Recognise that quadratic equations (those where x is raised to the power of 2) create parabola.
☐ Recognise the basic parabola $y = x^2$ as having a 'smiling' shape and turning point at (0,0)
☐ Recognise that transformations can be applied to this parabola. It can be reflected over the x-axis (giving it a 'frowning' shape), it can be widened or narrowed, and it can be moved to the left or right and up or down on the Cartesian plane.
☐ Understand the turning point form of the quadraic equation $y = a(x - h)^2 + k$. The positive or negative sign of the a value determines whether the parabola will be 'smiling' or 'frowning'. The numeric a value widens or narrows the parabola, the h value translates the parabola horizontally and the k value translates it vertically.
☐ Write the equations for given parabolas using turning point form.</td><td>7B – Sketching parabolas using transformations Q1-6
Video: Parabolas in turning pt form</td></tr>
<tr><td>5</td><td>☐ Recognise $x^2 + y^2 = 1$ is the equation for the most basic circle: a circle centred at the origin with a radius of one unit.
☐ Recognise that the basic circle can be enlarged and translated using the equation $(x - h)^2 + (y - k)^2 = r^2$, where (h, k) is the centre of the circle and r its radius.
☐ Find the equation for given circles on the Cartesian plane.
☐ Sketch circles on the Cartesian plane, given their equation in the above form.
☐ Match lines, parabolas and circles to their equations.
☐ Solve problems involving lines, parabolas and circles and their equations.</td><td>Circle resource provided
Video: Equations of circles</td></tr>
<tr><td>6</td><td>Topic 3: Probability
☐ Understand the language of probability: event, outcome, sample space
☐ Use the formula: $probablity = \frac{number\ of\ favourable\ outcomes}{total\ number\ of\ outcomes}$ to determine probabilities in simple experiments with equally likely outcomes
☐ Use two-way-tables to determine the sample space in simple two step experiments, then calculate probabilities
For example: A coin is flipped and a 6-sided die is rolled. Use a two-way table to determine the sample space and calculate the probability of getting: a.) an odd number b.) tails and an even number c.) Heads or a 5 d.) Heads or a 5
<table><tr><td></td><td colspan="7">Die</td></tr><tr><td rowspan="3">Coin</td><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>H</td><td>H1</td><td>H2</td><td>H3</td><td>H4</td><td>H5</td><td>H6</td></tr><tr><td>T</td><td>T1</td><td>T2</td><td>T3</td><td>T4</td><td>T5</td><td>T6</td></tr></table>a.) $P(odd) = \frac{6}{12}$ b.) $P(tails\ and\ even) = \frac{3}{12}$
c.) $P(heads\ and\ 5) = \frac{1}{12}$ d.) $P(heads\ or\ 5) = \frac{7}{12}$</td><td>8A – Review of probability Q1-3, 10-12
8E – Two step experiments using arrays Q1-4</td></tr>
<tr><td>7</td><td>☐ Understand the multiplication principal that if the $P(A) = 0.4$ and $P(B) = 0.5$ the probability of both A and B happening is $P(A) \times P(B) = 0.4 \times 0.5 = 0.2$
☐ Use tree diagrams to list outcomes for multi-step chance experiments and use the multiplication principal to assign probabilities to each outcome.</td><td>8F – Using tree diagrams Q1-12</td></tr>
<tr><td>8</td><td>☐ Revision of Topics 1, 2 and 3.</td><td></td></tr>
<tr><td>9</td><td>☐ Summative Exam</td><td></td></tr>
</table>

Year 10 General Mathematics
Term 4

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Assessment Details	
Type	Class investigations and written report
Conditions	3 lessons
Date	Weeks 4-6 (The middle lesson of weeks 4 and 5 is to be used for the class Investigations and the middle lesson of week 6 is to be used for the Individual written report.)

Achievement Standard

- They compare data sets by referring to the shapes of the various data displays.
- They describe bivariate data where the independent variable is time.
- Students describe statistical relationships between two continuous variables.
- They calculate quartiles and inter-quartile ranges.
- They evaluate statistical reports.

Week	Curriculum Intent	Learning Advice
1	**Statistics**	Cambridge Ex 9D Q1, 2, 3
	Determine quartiles and interquartile range • Determine five number summaries (minimum, lower quartile, median, upper quartile and maximum) • Calculate range and interquartile range	Maths Quest Ex. 12.4 and Ex. 12.3
2	**Construct and interpret box plots and use them to compare data sets** • Use five number summaries to construct box plots • Interpret the centre and spread of data sets • Use range, IQR and median to compare data sets	Cambridge Ex 9E 1, 2, 3, 4, 5 Maths Quest Ex. 12.4 and Ex. 12.6
3	**Compare shapes of box plots to corresponding histograms and dot plots** • Construct histograms and dot plots • Compare different data displays to draw conclusions about data sets • Use excel to construct boxplots and histograms	Cambridge Ex 9E 6 Maths Quest Ex. 12.4
4	**Use scatter plots to investigate and comment on relationships between two numerical variables** • Construct scatter plots • Make comparisons and draw conclusions • Use excel to construct scatter plots and lines of best fit • Class investigation Part 1 in middle lesson this week	Cambridge Ex 9I 1, 2, 3, 4, 5, 6, 7 Maths Quest Ex. 13.2 p. 840 Q1-6, 7a, 9a, 14a Ex. 13.2 p. 841 Q 7b, 9b, 14b Ex. 13.4 p. 859 Q1, 4a b, 5a b
5	**Investigate and describe bivariate numerical data where the independent variable is time** • Construct data displays representing bivariate data over time • Interpret data displays representing bivariate data over time • Use excel to construct displays • Class Investigation Part 2 in middle lesson this week	Cambridge Ex 9H 1, 2, 3 Maths Quest Ex. 13.5 Use data from textbook questions in Ex. 13.5 to construct displays.

6	**Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data** • Statistical investigation • Individual Written report in middle lesson this week	
7	Mixed worksheets on preparation for Year 11 General maths	
8	Mixed worksheets on preparation for Year 11 General maths	