			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
COURSE	**Mathematics Standard Year 11**										
TOPIC			**Algebra**								
SUBTOPIC	MS-A1		Formulae and equations				***Overview:*** SAME/SIMILAR			***GENERAL:***	AM1, FSDr
	A1-1	•	review substitution of numerical values into linear and non-linear algebraic expressions and equations			ACMGM010	substitute numerical values into linear algebraic and simple non-linear algebraic expressions, and evaluate	SAME	Prelim	AM1	substitute numerical values into algebraic expressions
	A1-1a	–	review evaluating the subject of a formula, given the value of other pronumerals in the formula					SAME	Prelim	AM1	substitute given values for the other pronumerals in a mathematical formula from a vocational or other context to find the value of the subject of the formula
	A1-1b	–	review changing the subject of a linear formula					from HSC	HSCGen2	AM3	change the subject of a formula
	A1-1c	–	solve problems involving formulae, including but not limited to calculating distance, speed and time (with change of units of measurement as required) or calculating stopping distances of vehicles using a suitable formula	AAM	PSC	ACMGM011	find the value of the subject of the formula, given the values of the other pronumerals in the formula	SAME	Prelim	FSDr3	calculate distance, speed and time, given two of the three quantities (with change of units of measurement as required)
								SAME	Prelim	FSDr3	calculate stopping distance, including by substitution of values into suitable formulae
	A1-2	•	develop and solve linear equations, including but not limited to those derived from substituting values into a formula, or those developed from a word description	AAM	CCT,LIT,PSC	ACMGM038	identify and solve linear equations	SAME	Prelim	AM1	solve linear equations involving two steps
								from HSC	HSCGen2	AM3	solve equations following substitution of values
						ACMGM039	develop a linear formula from a word description				
								from Gen1	HSCGen1	AM3CEC	solve equations, including equations where solution involves the removal of brackets and equations with an unknown in the denominator
								from Gen1	HSCGen1	AM3CEC	solve for a linear term in an equation following substitution into a mathematical formula from a vocational or other context
	A1-3	•	calculate and interpret blood alcohol content (BAC) based on drink consumption and body weight	AAM	EU,CC			SAME	Prelim	FSDr3	calculate and interpret blood alcohol content (BAC) based on drink consumption and body mass
	A1-3a	–	use formulae, both in word form and algebraic form, to calculate an estimate for BAC, including BAC_Male=(10N-7.5H)/6.8M and BAC_Female=(10N-7.5H)/5.5M where N is the number of standard drinks consumed, H is the number of hours of drinking, and M is the person's weight in kilograms.					SAME	Prelim	FSDr3	using formulae, both in word form and algebraic form, to calculate an estimate for BAC

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
A1-3b	–	determine the number of hours required for a person to stop consuming alcohol in order to reach zero BAC, for example, using the formula time=BAC/0.015					SAME	Prelim	FSDr3	determining the number of hours requires for a person who stops consuming alcohol to reach zero BAC
A1-3c	–	describe limitations of methods estimating BAC					SAME	Prelim	FSDr3	describing limitations of methods of estimating BAC
A1-4	•	calculate required medication dosages for children and adults from packets, given age or weight, using Fried's formula, Young's formula or Clark's formula as appropriate	AAM	LIT			from HSC	HSCGen2	FSHe2	calculate required dosages for children and adults from packets given age or weight
							from HSC	HSCGen2	FSHe2	calculate required dosages for children using various formulae
SUBTOPIC MS-A2		Linear Relationships				***Overview:*** SAME/from HSC			***GENERAL:***	AM2, AM4
A2-1	•	model, analyse and solve problems involving linear relationships, including constructing a straight-line graph and interpreting features of a straight-line graph, including the gradient and intercepts	AAM	S,CCT	ACMMM002	examine examples of direct proportion and linearly related variables				
A2-1a	–	recognise that a direct variation relationship produces a straight-line graph			ACMMM003	recognise features of the graph of y=mx+c, including its linear nature, its intercepts and its slope or gradient	from HSC	HSCGen2	AM4	develop graphs of linear equations of the form y = mx from descriptions of situations in which one quantity varies directly with another
A2-1b	–	determine a direct variation relationship from a written description, a straight-line graph passing through the origin, or a linear function in the form y=mx		CCT,LIT			from HSC	HSCGen2	AM4	develop graphs of linear equations of the form y = mx from descriptions of situations in which one quantity varies directly with another
A2-1c	–	review the linear function y=mx+c and understand the geometrical significance of m and c			ACMGM041	determine the slope and intercepts of a straight-line graph from both its equation and its plot	SAME	Prelim	AM2	calculate the gradient of a straight line from a graph
					ACMGM042	interpret, in context, the slope and intercept of a straight-line graph used to model and analyse a practical situation	SAME	Prelim	AM2	determine the y-intercept for a given graph
							SAME	Prelim	AM2	establish a meaning for the intercept on the vertical axis in a given context
							SAME	Prelim	AM2	sketch graphs of linear functions expressed in the form y = mx + b without the use of tables
A2-1d	–	recognise the gradient of a direct variation graph as the constant of variation	AAM	CCT,ICT,LIT			SAME	Prelim	AM2	calculate the gradient of a straight line from a graph
							from HSC	HSCGen2	AM4	use the graph in the previous dot point to establish the value of m (the gradient) and to solve problems related to the given variation context
A2-1e	–	construct straight-line graphs both with and without the aid of digital technology		ICT	ACMGM040	construct straight-line graphs both with and without the aid of technology	SAME	Prelim	AM2	generate tables of values from a linear equation
							SAME	Prelim	AM2	graph linear functions with pencil and paper, and with technology, given an equation or a table of values
							from HSC	HSCGen2	AM4	generate tables of values for linear functions (including for negative values of x)

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
								from HSC	HSCGen2	AM4	graph linear functions for all values of x with pencil and paper, and with graphing software
	A2-2	•	construct and analyse a linear model, graphically or algebraically, to solve practical direct variation problems, including but not limited to the cost of filling a car with fuel or a currency conversion graph	AAM	S,PSC	ACMGM043	construct and analyse a straight-line graph to model a given linear relationship; for example, modelling the cost of filling a fuel tank of a car against the number of litres of petrol required	SAME	Prelim	AM2	use graphs to make conversions, eg Australian dollars to euros
								SAME	Prelim	AM2	use linear equations to model practical situations, eg simple interest
								from HSC	HSCGen2	AM4	solve contextual problems involving linear models
	A2-2a	–	identify and evaluate the limitations of a linear model in a practical context					SAME	Prelim	AM2	describe the limitations of linear models in practical contexts.
TOPIC			**Measurement**								
SUBTOPIC	MS-M1		Applications of Measurement					***Overview:*** SAME/HSC/NEW		***GENERAL:***	MM1, MM2, MM4, TRAPEZOIDAL
CONTENT	M1.1		Practicalities of measurement								
	M1.1-1	•	review the use of different metric units of measurement including units of area, take measurements, and calculate conversions between common units of measurement, for example kilometres to metres or litres to millilitres			ACMEM090	review metric units of length, their abbreviations, conversions between them, estimation of lengths, and appropriate choices of units	SAME	Prelim	MM1	convert between common units for area
						ACMEM092	review metric units of area, their abbreviations, and conversions between them	SAME	Prelim	MM1	Considerations
	M1.1-2	•	calculate the absolute error of a reported measurement and state the corresponding limits of accuracy					SAME	Prelim	MM1	investigate the degree of accuracy of reported measurements, including the use of significant figures where appropriate
	M1.1-2a	–	investigate types of errors, for example, human error or device limitations		CCT			NEW			
	M1.1-2b	–	calculate the percentage error of a reported measurement					SAME	Prelim	MM1	Considerations
								from HSC	HSCGen2	MM4	calculate the percentage error in a measurement
	M1.1-3	•	use standard form and standard metric prefixes in the context of measurement, with and without a required number of significant figures		ICT			SAME	Prelim	MM1	use scientific notation and standard prefixes in the context of measurement
								SAME	Prelim	MM1	express measurements in scientific notation
CONTENT	M1.2		Perimeter, area and volume								
	M1.2-1	•	review and extend how to solve practical problems requiring the calculation of perimeters and areas of triangles, rectangles, parallelograms, trapezia, circles, sectors of circles and composite shapes		CCT,LIT	ACMGM018	solve practical problems requiring the calculation of perimeters and areas of circles, sectors of circles, triangles, rectangles, parallelograms and composites	SAME	Prelim	MM2	calculate the perimeter of simple figures, including right-angled triangles, circles, semicircles and quadrants
								SAME	Prelim	MM2	calculate the perimeter and area of simple composite figures consisting of two shapes, including semicircles and quadrants

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
							SAME	Prelim	MM2	identify and use the correct formula to solve practical area problems
							KNOWLEDGE	Prelim	MM2	estimate areas and volumes
							SIMILAR	HSCGen2	MM4	calculate areas of annuluses and parts of a circle (quadrant, sector), using appropriate formulae
							from HSC	HSCGen2	MM4	calculate areas of composite figures constructed from squares, rectangles, triangles and circles
M1.2-1a	–	review the use of Pythagoras' theorem to solve problems involving right-angled triangles					SAME	Prelim	MM2	Considerations
M1.2-2	•	solve problems involving surface area of solids including but not limited to prisms, cylinders, spheres and composite solids					from HSC	HSCGen2	MM4	calculate the surface area of right prisms
							from HSC	HSCGen2	MM4	calculate the surface area of cylinders (without 'top' and/or 'bottom') and closed cylinders
							from HSC	HSCGen2	MM4	calculate the surface area of spheres
M1.2-3	•	solve problems involving volume and capacity of solids including but not limited to prisms, cylinders, spheres and composite solids								
		prisms					SAME	Prelim	MM2	calculate the volume of right prisms and cylinders using appropriate formulae
		cylinders					SAME	Prelim	MM2	calculate the volume of right prisms and cylinders using appropriate formulae
		spheres					NEW			
		and composite solids					from HSC	HSCGen2	MM4	calculate volumes of composite solids
							from HSC	HSCGen2	MM4	calculate the volume of right prisms, where the base is a composite or irregular two-dimensional shape
							KNOWLEDGE	Prelim	MM2	estimate areas and volumes
							from HSC	HSCGen2	MM4	calculate the volume of a cone, square pyramid and rectangular pyramid using appropriate formulae
M1.2-3a	–	convert between units of volume and capacity					SAME	Prelim	MM1	convert between common units for volume
							SAME	Prelim	MM2	convert between units of volume and capacity.
M1.2-4	•	calculate perimeters and areas of irregularly shaped blocks of land by dissection into regular shapes including triangles and trapezia	AAM		ACMEM094	find the area of irregular figures by decomposition into regular shapes	SIMILAR	Prelim	MM2	calculate the perimeter and area of irregularly shaped blocks of land using a field diagram
M1.2-4a	–	derive the Trapezoidal rule for a single application, $A \approx h/2(d_f+d_l)$					NEW			
M1.2-4b	–	use the Trapezoidal rule to solve a variety of practical problems					NEW			
M1.2-4c	–	use the Trapezoidal rule to estimate the base area of a solid in a practical context, using digital technology, and then calculate its approximate volume, for example the volume of water in a swimming pool		ICT			NEW			

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	M1.2-5	•	solve problems involving perimeters, area, surface area, volumes and capacity in a variety of contexts	AAM							
CONTENT	M1.3		Units of energy and mass								
	M1.3-1	•	review the use of metric units of mass in solving problems, including grams, kilograms and tonnes, their abbreviations and how to convert between them		LIT	ACMEM025	use metric units of mass, their abbreviations, conversions between them, and appropriate choices of units	SAME	Prelim	MM1	Considerations
								from HSC	HSCGen2	FSHe2	convert grams (g) to milligrams (mg), and vice versa
								NEW			
	M1.3-2	•	use metric units of energy to solve problems, including calories, kilocalories, joules and kilojoules, their abbreviations and how to convert between them			ACMEM034	convert from one unit of energy to another.	NEW			
	M1.3-3	•	use units of energy and mass to solve problems related to food and nutrition, including calories		PSC	ACMEM032	use units of energy used for foods, including calories	NEW			
	M1.3-4	•	use units of energy to solve problems involving the amount of energy expended in activities, for example, kilojoules		PSC	ACMEM033	use units of energy to describe the amount of energy in activity, such as kilojoules	NEW			
	M1.3-5	•	use units of energy to solve problems involving the consumption of electricity, for example, kilowatt hours, and investigate common appliances in terms of their energy consumption	AAM	S,LIT	ACMEM031	use units of energy to describe consumption of electricity, such as kilowatt hours	from HSC	HSCGen2	FSRe3	rank common appliances and physical activities in terms of their energy consumption in watts
								from HSC	HSCGen2	FSRe3	describe the watt-hour and kilowatt-hour as units of energy usage
								from HSC	HSCGen2	FSRe3	calculate the cost of running different household appliances for various time periods, given the power rating, usage time, and cost of power
								from HSC	HSCGen1	FSPe2CEC	calculate the cost of running different household appliances for various time periods, given the power rating, usage time, and cost of power
SUBTOPIC	MS-M2		Working with Time				***Overview:*** HSC/NEW			***GENERAL:***	MM6
	M2-1	•	indicate positions on the Earth's surface					from HSC	HSCGen2	MM6	locate positions on the surface of the Earth using latitude and longitude
	M2-1a	–	locate points on Earth's surface using latitude, longitude or position coordinates with a globe, an atlas and digital technologies, for example, a smartphone or GPS device		ICT	ACMEM159	locate positions on Earth's surface given latitude and longitude using GPS, a globe, an atlas, and digital technologies	from HSC	HSCGen2	MM6	locate positions on the surface of the Earth using latitude and longitude
	M2-2	•	calculate times and time differences around the world	AAM				from HSC	HSCGen2	MM6	use time zones and the International Date Line in solving problems
	M2-2a	–	review using units of time, converting between 12-hour and 24-hour clocks and calculating time intervals			ACMEM076	use units of time, conversions between units, fractional, digital and decimal representations	NEW			
						ACMEM077	represent time using 12-hour and 24-hour clocks	NEW			
						ACMEM078	calculate time intervals, such as time between, time ahead, time behind	NEW			

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	M2-2b	–	solve problems involving time zones in Australia and in neighbouring nations, making any necessary allowances for daylight saving		AAA,PSC,CC	ACMEM163	solve problems involving time zones in Australia and in neighbouring nations, making any necessary allowances for daylight saving	from HSC	HSCGen2	MM6	use time zones and the International Date Line in solving problems
	M2-2c	–	solve problems involving Coordinated Universal Time (UTC), and the International Date Line (IDL)			ACMEM164	solve problems involving Greenwich Mean Time and the International Date Line	SIMILAR	HSCGen2	MM6	use time zones and the International Date Line in solving problems
	M2-2d	–	find time differences between two places on Earth using recognised international time zones		IU,PSC	ACMEM165	find time differences between two places on Earth	SIMILAR	HSCGen2	MM6	calculate time differences between locations on the Earth given the difference in longitude
	M2-2e	–	review how to interpret timetables, for example, bus, train and ferry timetables, and use them to solve problems		PSC,CC	ACMEM079	interpret timetables, such as bus, train and ferry timetables	NEW			
	M2-2f	–	solve practical problems, for example, travelling east and west, incorporating time zones, or internet and phone usage across time zones, or the timing of events broadcast live from states of countries between different time zones		CCT,ICT,IU,PSC	ACMEM166	solve problems associated with time zones; for example, internet and phone usage	from HSC	HSCGen2	MM6	determine the times in cities in different countries in travel questions
						ACMEM167	solve problems relating to travelling east and west, incorporating time zone changes.				
TOPIC			**Financial Mathematics**								
SUBTOPIC	MS-F1		Money Matters				***Overview:*** SAME/GEN1			***GENERAL:***	FM1,FM2,FM3,FS
CONTENT	F1.1		Interest and depreciation								
	F1.1-1	•	calculate simple interest for different rates and periods			ACMEM064	calculate simple interest for different rates and periods.	SAME	Prelim	FM2	calculate simple interest
								SAME	Prelim	FM2	calculate monthly, quarterly and six-monthly interest rates based on quoted rates per annum (pa)
	F1.1-1a	–	apply percentage increase or decrease in various contexts, for example calculating the goods and services tax (GST) payable on a range of goods and services, and calculating profit or loss in absolute and percentage terms		PSC,WE	ACMGM006	apply percentage increase or decrease in various contexts; for example, determining the impact of inflation on costs and wages over time, calculating percentage mark-ups and discounts, calculating GST, calculating profit or loss in absolute and percentage terms, and calculating simple and compound interest	SIMILAR	Prelim	FM3	calculate the goods and services tax (GST) payable on a range of goods and services
								SIMILAR	Prelim	FSDr1	calculate the percentage decrease in the value of a new vehicle after one year
	F1.1-1b	–	use digital technology or otherwise to compare simple interest graphs for different rates and periods		ICT			SIMILAR	Prelim	FM2	use tables of values for fixed values of P, and hence draw and describe graphs of I against n for different values of r
	F1.1-2	•	calculate the depreciation of an asset using the straight-line method as an application of the simple interest formula	AAM				SIMILAR	Prelim	FSDr2	calculate the depreciation of a vehicle using the straight-line method and the declining-balance method
	F1.1-3	•	use a spreadsheet to calculate and graph compound interest as a recurrence relation involving repeated applications of simple interest	AAM	ICT	ACMEM169	understand the concept of compound interest as a recurrence relation	NEW			
CONTENT	F1.2		Earning and managing money								

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
F1.2-1	•	calculate monthly, fortnightly, weekly, daily or hourly pay rates from a given salary, wages involving hourly rates and penalty rates, including situations involving overtime and other special allowances, and earnings based on commission (including commission based on a sliding scale), piecework or royalties		ICT,PSC,CC,WE	ACMGM002	calculate weekly or monthly wage from an annual salary, wages from an hourly rate including situations involving overtime and other allowances and earnings based on commission or piecework	SAME	Prelim	FM1	calculate monthly, fortnightly, weekly, daily and hourly pay rates from a given salary
							SAME	Prelim	FM1	calculate wages involving hourly rates and penalty rates, eg overtime; and special allowances, including allowances for wet work, confined spaces, toxic substances, heat, heights, etc
							SAME	Prelim	FM1	describe the differences between salaries, wages and commissions
							SAME	Prelim	FM1	compare different ways of earning
							SAME	Prelim	FM1	calculate earnings based on commission (including commission based on a sliding scale), piecework and royalties
F1.2-1a	–	calculate annual leave loading					SAME	Prelim	FM1	calculate annual leave loading
F1.2-1b	–	calculate payments based on government allowances and pensions			ACMGM003	calculate payments based on government allowances and pensions	SAME	Prelim	FM1	calculate payments based on government allowances and pensions, eg allowances for youth, tertiary study and travel
F1.2-2	•	calculate income tax					SAME	Prelim	FM3	calculate taxable income
F1.2-2a	–	identify allowable tax deductions, for example tax instalments, superannuation contributions, health fund instalments, union fees, HECS repayments, trade tools, mobile phone use, professional magazine subscription, home office equipment or a utility vehicle		EU,PSC,CC,WE			SAME	Prelim	FM3	calculate the amount of allowable deductions from gross income
F1.2-2b	–	calculate taxable income after allowable tax deductions are taken from gross pay		WE			SAME	Prelim	FM3	calculate taxable income
F1.2-2c	–	calculate the Medicare levy (basic levy only)					SAME	Prelim	FM3	calculate the Medicare levy (basic levy only – see Tax Pack for details)
F1.2-2d	–	calculate net pay following deductions from income					SAME	Prelim	FM1	determine deductions from income, eg tax instalments, superannuation contributions, health-fund instalments, union fees and HECS repayments
							SAME	Prelim	FM1	calculate net pay following deductions from gross pay
F1.2-2e	–	calculate the amount of Pay As You Go (PAYG) tax payable per fortnight or week using current tax scales, and use this to determine if more tax is payable or if a refund is owing after completing a tax return		WE			SAME	Prelim	FM3	calculate the amount of Pay As You Go (PAYG) tax payable or refund owing, using current tax scales

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	F1.2-3	•	use digital technology to perform financial computations, for example calculating percentage change, calculating tax payable and preparing a wage-sheet		ICT,WE	ACMGM009	use a spreadsheet to display examples of the above computations when multiple or repeated computations are required; for example, preparing a wage-sheet displaying the weekly earnings of workers in a fast food store where hours of employment and hourly rates of pay may differ, preparing a budget, or investigating the potential cost of owning and operating a car over a year.	SIMILAR	Prelim	MM1	determine the overall change in a quantity following repeated percentage changes
CONTENT	F1.3		Budgeting and household expenses								
	F1.3-1	•	interpret and use information about a household's electricity, water or gas usage and related charges and costs from household bills	AAM	S,CC			from HSC	HSCGen2	FSRe3	interpret information about a household's electricity usage, eg a household electricity bill
								from HSC Gen1	HSCGen1	FSHo2CEC	read and interpret common household bills, including bills for electricity, gas, telephone, council rates, land tax, water, and body-corporate and strata levies
								from HSC Gen1	HSCGen1	FSHo2CEC	perform calculations based on information contained in common household bills
								from HSC Gen1	HSCGen1	FSPe2CEC	interpret information about a household's electricity usage, eg a household electricity bill
	F1.3-2	•	plan for the purchase of a car	AAM	CCT,PSC						
	F1.3-2a	–	investigate on-road costs for new and used vehicles, including sale price (or loan repayments), registration, insurance and stamp duty at current rates		LIT,CC			SAME	Prelim	FSDr1	compare the cost of purchase of different motor vehicles (cars and motorcycles only), including finance, transfer of registration, and insurance
								SAME	Prelim	FSDr1	calculate the cost of stamp duty payable using current rates
	F1.3-2b	–	consider sustainability when choosing a vehicle to purchase, for example fuel consumption rates		S			SAME	Prelim	FSDr2	identify fuel consumption measures as rates
								SAME	Prelim	FSDr2	calculate the amount of fuel used on a trip
								SAME	Prelim	FSDr2	compare fuel consumption statistics for various vehicles
	F1.3-2c	–	calculate and compare the cost of purchasing different vehicles using a spreadsheet		CCT,ICT	ACMGM009	use a spreadsheet to display examples of the above computations when multiple or repeated computations are required; for example, preparing a wage-sheet displaying the weekly earnings of workers in a fast food store where hours of employment and hourly rates of pay may differ, preparing a budget, or investigating the potential cost of owning and operating a car over a year.	SIMILAR			
	F1.3-3	•	plan for the running and maintenance of a car	AAM	CCT,PSC						

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	F1.3-3a	–	describe the different types of insurance available, including compulsory and non-compulsory third-party insurance, and comprehensive insurance		LIT,PSC			SAME	Prelim	FSDr1	describe the different types of insurance available, including compulsory and non‑compulsory third-party insurance, and comprehensive insurance
	F1.3-3b	–	investigate other running costs associated with ownership of a vehicle, for example cost of servicing, repairs and tyres		LIT,PSC			NEW			
	F1.3-3c	–	calculate and compare the cost of running different vehicles using a spreadsheet		CCT,ICT	ACMGM009	use a spreadsheet to display examples of the above computations when multiple or repeated computations are required; for example, preparing a wage-sheet displaying the weekly earnings of workers in a fast food store where hours of employment and hourly rates of pay may differ, preparing a budget, or investigating the potential cost of owning and operating a car over a year.	SIMILAR			
	F1.3-4	•	prepare a personal budget for a given income, taking into account fixed and discretionary spending	AAM	CCT,ICT,CC	ACMGM004	prepare a personal budget for a given income taking into account fixed and discretionary spending	KNOWLEDGE	Prelim	FM1	evaluate a prepared budget
								SAME	Prelim	FM1	prepare a budget for a given income, taking into account fixed and discretionary spending
TOPIC			**Statistical Analysis**								
SUBTOPIC	MS-S1		Data Analysis				***Overview:*** SIMILAR/SAME/HSC			***GENERAL:***	DS1,DS2,DS3,DS4
CONTENT	S1.1		Classifying and representing data (grouped and ungrouped)								
	S1.1-4	•	describe and use appropriate data collection methods for samples and population					SIMILAR	Prelim	DS1	determine whether data for the whole population is available (eg the results of a round of a sporting competition), or if sampling is necessary
								SIMILAR	Prelim	DS1	describe a method for choosing each type of sample in a given situation
	S1.1-1a	–	investigate whether a sample obtained from a population may or may not be representative of the population by considering different kinds of sampling methods: systematic sampling, self-selected sampling, simple random sampling and stratified sampling			ACMEM130	investigate the different kinds of samples; for example, systematic samples, self-selected samples, simple random samples	SIMILAR	Prelim	DS1	distinguish between the following sample types: random, stratified and systematic, and determine the appropriateness of each type for a given situation
								SIMILAR	Prelim	DS1	relate sample selection to population characteristics
	S1.1-1b	–	investigate the advantages and disadvantages of each type of sampling			ACMEM131	investigate the advantages and disadvantages of these kinds of samples; for example, comparing simple random samples with self-selected samples.	SIMILAR	Prelim	DS1	distinguish between the following sample types: random, stratified and systematic, and determine the appropriateness of each type for a given situation

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
S1.1-1c	–	describe the potential faults in the design and practicalities of data collection processes, for example, surveys, experiments and observational studies, misunderstandings and misrepresentations, including examples from the media			ACMEM134	describe the faults in the collection of data process	SIMILAR	Prelim	DS2	identify the misrepresentation of data.
					ACMEM135	describe sources of error in surveys; for example, sampling error and measurement error	SIMILAR	Prelim	DS1	identify possible sources of bias in the collection of a sample.
					ACMEM136	investigate the possible misrepresentation of the results of a survey due to misunderstanding the procedure, or misunderstanding the reliability of generalising the survey findings to the entire population				
					ACMEM137	investigate errors and misrepresentation in surveys, including examples of media misrepresentations of surveys.				
S1.1-2	•	classify data relating to a single random variable								
S1.1-2a	–	classify a categorical variable as either ordinal, for example, income level (low, medium, high) or nominal, for example, place of birth (Australia, overseas)			ACMGM027	classify a categorical variable as ordinal, such as income level (high, medium, low), or nominal, such as place of birth (Australia, overseas), and use tables and bar charts to organise and display the data	SAME	Prelim	DS1	classify data as quantitative (either discrete or continuous) or categorical (either nominal or ordinal)
S1.1-2b	–	classify a numerical variable as either discrete, for example the number of rooms in a house, or continuous, for example the temperature in degrees Celsius			ACMGM028	classify a numerical variable as discrete, such as the number of rooms in a house, or continuous, such as the temperature in degrees Celsius	SIMILAR	Prelim	DS1	classify data as quantitative (either discrete or continuous) or categorical (either nominal or ordinal)
S1.1-3	•	review how to organise and display data into appropriate tabular and/or graphical representations	**AAM**	ICT,LIT						
S1.1-3a	–	display categorical data in tables and, as appropriate, in both bar charts or Pareto charts			ACMEM045	display categorical data in tables and column graphs	SIMILAR	Prelim	DS2	Considerations
							SIMILAR	Prelim	DS2	link type of data with an appropriate display, eg continuous quantitative data with a histogram, or categorical data with a divided bar graph or sector graph (pie chart)
							NEW			
S1.1-3b	–	display numerical data as frequency distribution tables and histograms, cumulative frequency distribution tables and graphs, dot plots and stem and leaf plots (including back-to-back where comparing two datasets)			ACMEM046	display numerical data as frequency distributions, dot plots, stem and leaf plots, and histograms				
					ACMEM057	compare back-to-back stem plots for different data-sets				
	└	frequency distribution tables and histograms					SIMILAR	Prelim	DS2	construct frequency tables for grouped data from cumulative frequency graphs (histograms and polygons)
							SIMILAR	HSCGen2	DS4	represent large data sets as grouped data using frequency tables and histograms

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
		└	cumulative frequency distribution tables and graphs					SIMILAR	Prelim	DS2	construct frequency tables for grouped data from cumulative frequency graphs (histograms and polygons)
		└	dot plots					SAME	Prelim	DS2	construct a dot plot from a small data set and interpret the dot plot
		└	stem and leaf plots (including back-to-back where comparing to datasets)					from HSC	HSCGen2	DS4	display data in double (back-to-back) stem-and-leaf plots
	S1.1-3c	–	construct and interpret tables and graphs related to real-world contexts, including but not limited to: motor vehicle safety including driver behaviour, accident statistics, blood alcohol content over time, running costs of a motor vehicle, costs of purchase and insurance, vehicle depreciation, rainfall graphs, hourly temperature, household and personal water usage					SIMILAR	Prelim	FSDr1	analyse theft and accident statistics in relation to insurance costs
								MAYBE	Prelim	FSDr2	create a depreciation graph based on the straight-line method of depreciation (graphs to be produced from formulae and tables)
								SAME	Prelim	FSDr3	construct and interpret tables and graphs relating to motor vehicles and motor vehicle accidents
								SAME	Prelim	FSDr3	construct and interpret graphs that illustrate the level of blood alcohol over time
	S1.1-4	•	interpret and compare data by considering it in tabular and/or graphical representations	AAM	ICT,LIT						
	S1.1-4a	–	choose appropriate tabular and/or graphical representations to enable comparisons					NEW			
	S1.1-4b	–	compare the suitability of different methods of data presentation in real-world contexts, including their visual appeal, for example a heat map to illustrate climate change data or the median house prices across suburbs		S,EU,DD	ACMEM048	compare the suitability of different methods of data presentation in real-world contexts.	SIMILAR	Prelim	DS2	Considerations
CONTENT	S1.2		Exploring and describing data arising from a single continuous variable								
	S1.2-1	•	describe the distinguishing features of a population and sample					NEW			
	S1.2-1a	–	define notations associated with population values (parameters) and sample-based estimates (statistics), including population mean μ, population standard deviation σ, sample mean $\bar{x}$ and sample standard deviation s					NEW			
								SIMILAR	Prelim	DS3	describe standard deviation informally as a measure of the spread of data in relation to the mean
								SIMILAR	Prelim	DS3	calculate standard deviation using a calculator
	S1.2-2	•	summarise and interpret grouped and ungrouped data through appropriate graphs and summary statistics	AAM		ACMGM030	determine the mean and standard deviation of a dataset and use these statistics as measures of location and spread of a data distribution, being aware of their limitations.	SIMILAR	Prelim	DS2	interpret the various displays of single data sets

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
S1.2-2a	–	discuss the mode and determine where possible			ACMEM049	identify the mode	SAME	Prelim	DS3	calculate the measures of location – mean, mode and median – for grouped data presented in table or graphical form
S1.2-2b	–	calculate measures of central tendency, including the arithmetic mean and the median			ACMEM050	calculate measures of central tendency, the arithmetic mean and the median	SIMILAR	Prelim	DS3	calculate the median, including from stem-and-leaf plots and cumulative frequency polygons
							SAME	Prelim	DS3	calculate the measures of location – mean, mode and median – for grouped data presented in table or graphical form
							SAME	Prelim	DS3-3	determine the mean for larger data sets of either ungrouped or grouped data using the statistical functions of a calculator
							from HSC	HSCGen2	DS3-3	estimate measures of location, including median, upper and lower quartiles, from frequency tables, cumulative frequency tables, and cumulative frequency histograms and polygons
S1.2-2c	–	investigate the suitability of measures of central tendency in real-world contexts and use them to compare datasets		CCT,CC	ACMEM051	investigate the suitability of measures of central tendency in various real-world contexts	SAME	Prelim	DS3	select and use the appropriate statistic (mean, median or mode) to describe features of a data set, eg median house price or modal shirt size
S1.2-2d	–	calculate measures of spread including the range, quantiles (including but not limited to quartiles, deciles and percentiles), interquartile range (IQR) and standard deviation (calculations for standard deviation only required using digital technology)		ICT	ACMEM053	calculate and interpret quartiles, deciles and percentiles	SAME	Prelim	DS2	divide large sets of data into deciles, quartiles and percentiles and interpret displays
					ACMEM055	calculate and interpret statistical measures of spread, such as the range, interquartile range and standard deviation	SAME	Prelim	DS2	calculate and interpret the range and interquartile range as measures of the spread of a data set
							SAME	Prelim	DS3	calculate standard deviation using a calculator
S1.2-3	•	investigate and describe the effect of outliers on summary statistics					SAME	Prelim	DS3	assess the effect of outlying values on summary statistics for small data sets.
S1.2-3a	–	use different approaches for identifying outliers, including consideration of the distance from the mean or median, or the use of Q1-1.5×IQR and Q3+1.5×IQR criteria, recognising and justifying when each approach is appropriate			ACMEM047	recognise and identify outliers	SAME	HSCGen2	DS4	Considerations
S1.2-3b	–	investigate and recognise the effect of outliers on the mean and median			ACMEM052	investigate the effect of outliers on the mean and the median	from HSC	HSCGen2	DS4	identify outliers in data sets and their effect on the mean, median and mode
S1.2-4	•	investigate real-world examples from the media illustrating appropriate and inappropriate use or misuse of measures of central tendency and spread	AAM		ACMEM056	investigate real-world examples from the media illustrating inappropriate uses, or misuses, of measures of central tendency and spread.	NEW			

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
S1.2-5	•	describe, compare and interpret the distributions of graphical displays and/or numerical datasets and report findings in a systematic and concise manner	AAM	CCT,ICT	ACMGM029	with the aid of an appropriate graphical display (chosen from dot plot, stem plot, bar chart or histogram), describe the distribution of a numerical dataset in terms of modality (uni or multimodal), shape (symmetric versus positively or negatively skewed), location and spread and outliers, and interpret this information in the context of the data	from HSC	HSCGen2	DS4	describe the general shape of a graph or display that represents a given data set, eg in terms of smoothness, symmetry, skewness or number of modes
					ACMGM032	compare groups on a single numerical variable using medians, means, IQRs, ranges or standard deviations, as appropriate; interpret the differences observed in the context of the data; and report the findings in a systematic and concise manner	from HSC Gen1	HSCGen1	DS4CEC	recognise and describe in general terms different distributions of data, including normal, skewed, uniform, symmetric, unimodal and bi-modal distributions
S1.2-5a	–	identify modality (unimodal, bimodal or multimodal)					SIMILAR HSC Gen1	HSCGen1	DS4CEC	give examples of data sets that are normal, skewed, uniform, symmetric, unimodal and bi-modal
S1.2-5b	–	identify shape (symmetric or positively or negatively skewed)					SIMILAR HSC Gen1	HSCGen1	DS4CEC	give examples of data sets that are normal, skewed, uniform, symmetric, unimodal and bi-modal
S1.2-5c	–	identify central tendency, spread and outliers, using and justifying appropriate criteria								
S1.2-5d	–	calculate measures of central tendency or measures of spread where appropriate					from HSC	HSCGen2	DS4	calculate measures of location for grouped data: mean, mode and median
							from HSC	HSCGen2	DS4	calculate measures of spread: range, interquartile range, and population standard deviation
S1.2-6	•	construct and compare parallel box-plots	AAM	ICT	ACMEM059	construct box plots using a five number summary	SAME	Prelim	DS2	develop a box-and-whisker plot from a five-number summary
							MAYBE	HSCGen2	DS4	determine the percentages of data between any two quartiles on a box-and-whisker plot
							from HSC	HSCGen2	DS4	display data in two box-and-whisker plots drawn on the same scale
S1.2-6a	–	complete a five-number summary for different datasets			ACMEM058	complete a five number summary for different datasets	SAME	Prelim	DS2	establish a five-number summary for a data set (lower extreme, lower quartile, median, upper quartile and upper extreme)
S1.2-6b	–	compare groups in terms of central tendency (median), spread (IQR and range) and outliers (using appropriate criteria)			ACMGM031	construct and use parallel box plots (including the use of the 'Q1 – 1.5 x IQR' and 'Q3 + 1.5 x IQR' criteria for identifying possible outliers) to compare groups in terms of location (median), spread (IQR and range) and outliers and to interpret and communicate the differences observed in the context of the data	SIMILAR from HSC	HSCGen2	DS4	use multiple displays to describe and interpret the relationships between data sets
S1.2-6c	–	interpret and communicate the differences observed between parallel box-plots in the context of the data					from HSC	HSCGen2	DS4	use side-by-side multiple displays of the same data set, eg a side-by-side histogram and a box-and-whisker plot
SUBTOPIC MS-S2		Relative Frequency and Probability					***Overview:*** SIMILAR/SAME/HSC		***GENERAL:***	PB1,PB2

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
S2-1	•	review, understand and use the language associated with theoretical probability and relative frequency		LIT			SAME			Inferred
S2-1a	–	construct a sample space for an experiment and use it to determine the number of outcomes			ACMEM154	construct a sample space for an experiment	SIMILAR	Prelim	PB1	determine the number of outcomes for a multistage experiment by multiplying the number of choices at each stage
					ACMEM155	use a sample space to determine the probability of outcomes for an experiment	SIMILAR	Prelim	PB1	verify the total number of outcomes for simple multistage experiments by systematic listing
S2-1a	–	review probability as a measure of the 'likely chance of occurrence' of an event			ACMMM052	review probability as a measure of 'the likelihood of occurrence' of an event	SAME			
S2-1a	–	review the probability scale: 0≤P(A)≤1 for each event A, with P(A)=0 if A is an impossibility and P(A)=1 if A is a certainty			ACMMM053	review the probability scale: 0≤P(A)≤10≤P(A)≤1 for each event A,A, with P(A)=0PA=0 if A A is an impossibility and P(A)=1PA=1 if AA is a certainty	SAME	Prelim	PB1	recognise that 0 ≤ P(event) ≤ 1
							KNOWLEDGE	Prelim	PB1	express probabilities as fractions, decimals and percentages
							SIMILAR	Prelim	PB1	comment critically on the validity of simple probability statements
S2-2	•	determine the probabilities associated with simple games and experiments			ACMEM157	determine the probabilities associated with simple games	SIMILAR	Prelim	PB1	identify events with equally likely outcomes
S2-2a	–	use the following definition of probability of an event where outcomes are equally likely: P(event)=(number of favourable outcomes)/(total number of outcomes)					SAME	Prelim	PB1	use the following definition of the theoretical probability of an event where outcomes are equally likely:
S2-2b	–	calculate the probability of the complement of an event using the relationship P(an event does not occur)=1-P(the event does occur)=P((the event does occur)~)=P(event^c)					SAME	Prelim	PB1	calculate the probability of the complement of an event using the relationship
S2-3	•	use arrays and tree diagrams to determine the outcomes and probabilities for multi-stage experiments	AAM		ACMEM156	use arrays or tree diagrams to determine the outcomes and the probabilities for experiments.				
S2-3a	–	construct and use tree diagrams to establish the outcomes for a simple multi-stage event					from HSC	HSCGen2	PB2	construct and use tree diagrams to establish the outcomes for a simple multistage event
S2-3b	–	use probability tree diagrams to solve problems involving two-stage events					from HSC	HSCGen2	PB2	use probability tree diagrams to solve problems involving two-stage events
S2-4	•	solve problems involving simulations or trials of experiments in a variety of contexts	AAM				SAME	Prelim	PB1	perform simple experiments and use recorded results to obtain relative frequencies
S2-4a	–	perform simulations of experiments using digital technology			ACMEM150	perform simulations of experiments using technology	MENTIONED			
S2-4b	–	use relative frequency as an estimate of probability			ACMEM152	identify relative frequency as probability	SAME	Prelim	PB1	use relative frequencies to obtain approximate probabilities
							SAME	Prelim	PB1	estimate the relative frequencies of events from recorded data
S2-4c	–	recognise that an increasing number of trials produces relative frequencies that gradually become closer in value to the theoretical probability			ACMEM151	recognise that the repetition of chance events is likely to produce different results	SIMILAR	Prelim	PB1	compare theoretical probabilities with experimental estimates
S2-4d	–	identify factors that could complicate the simulation of real-world events			ACMEM153	identify factors that could complicate the simulation of real-world events	NEW			

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	S2-5	•	solve problems involving probability and/or relative frequency in a variety of contexts	AAM							
	S2-5a	–	use existing known probabilities, or estimates based on relative frequencies to calculate expected frequency for a given sample or population, for example predicting, by calculation, the number of people of each blood type in a population given the percentage breakdowns					SIMILAR	Prelim	PB1	use relative frequencies to obtain approximate probabilities
COURSE	**Mathematics Standard 2 Year 12**										
TOPIC			**Algebra**								
SUBTOPIC	MS-A4		Types of Relationships				***Overview:*** PRELIM/SAME		***GENERAL:***	AM2,AM4,AM5	
CONTENT	A4.1		Simultaneous linear equations								
	A4.1-1	•	solve a pair of simultaneous linear equations graphically, by finding the point of intersection between two straight-line graphs, using digital technology		ICT	ACMGM044	solve a pair of simultaneous linear equations, using technology when appropriate	from Prelim	Prelim	AM2	sketch the graphs of a pair of linear equations to find the point of intersection
								from Prelim	Prelim	AM2	find the solution of a pair of simultaneous linear equations from a given graph
	A4.1-2	•	develop a pair of simultaneous linear equations to model a practical situation	**AAM**	CCT,ICT	ACMGM039	develop a linear formula from a word description	from Prelim	Prelim	AM2	solve practical problems using graphs of simultaneous linear equations
								SAME	HSCGen2	AM4	interpret linear functions as models of physical phenomena
								SAME	HSCGen2	AM4	develop and use linear functions to model physical phenomena
	A4.1-3	•	solve practical problems that involve finding the point of intersection of two straight-line graphs, for example determine and interpret the break-even point of a simple business problem where cost and revenue are represented by linear equations	**AAM**	WE	ACMGM045	solve practical problems that involve finding the point of intersection of two straight-line graphs; for example, determining the break-even point where cost and revenue are represented by linear equations.	from Prelim	Prelim	AM2	solve practical problems using graphs of simultaneous linear equations
								SAME	HSCGen2	AM4	interpret the point of intersection of the graphs of two linear functions drawn from practical contexts
								SAME	HSCGen2	AM4	solve contextual problems using a pair of simple linear simultaneous equations
								SAME	HSCGen2	AM4	apply break-even analysis to simple business problems that can be modelled with linear and quadratic functions
CONTENT	A4.2		Non-linear relationships								
	A4.2-1	•	use an exponential model to solve problems	**AAM**				SIMILAR	HSCGen2	AM5	solve contextual problems involving exponential growth
	A4.2-1a	–	graph and recognise an exponential function in the form y=a^x and y=a^(-x) (a > 0) using digital technology		ICT	ACMMM065	recognise the qualitative features of the graph of y=axy=ax (a>0)(a>0) including asymptotes, and of its translations (y=ax+by=ax+b and y=ax+cy=ax+c)	SIMILAR	HSCGen2	AM5	recognise, graph and compare, by completing tables of values, the properties of the graphs of y = ax^2 + c, y = ax^3 + c, y = a/x, y = b(a^x)

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
							SIMILAR	HSCGen2	AM5	develop equations of the form y = ax^2, h = at^3 from descriptions of situations in which one quantity varies directly as a power of another
A4.2-1b	–	interpret the meaning of the intercepts of an exponential graph in a variety of contexts		CCT						
A4.2-1c	–	construct and analyse an exponential model to solve a practical growth or decay problem		S	ACMMM066	identify contexts suitable for modelling by exponential functions and use them to solve practical problems	SAME	HSCGen2	AM5	use algebraic functions (as described above) to model physical phenomena
A4.2-2	•	construct and analyse a quadratic model to solve practical problems involving quadratic functions or expressions of the form y = ax² + bx + c, for example braking distance against speed	**AAM**	ICT,LIT	ACMMM006	examine examples of quadratically related variables	NEW			
					ACMMM009	find the equation of a quadratic given sufficient information				
A4.2-2a	–	recognise the shape of a parabola and that it always has a turning point and an axis of symmetry			ACMMM007	recognise features of the graphs of y=x2y=x2, y=a(x−b)2+c,y=a(x-b)2+c, and y=a(x−b)(x−c),y=ax-bx-c,including their parabolic nature, turning points, axes of symmetry and intercepts	NEW			
A4.2-2b	–	graph a quadratic function using digital technology		ICT			from Gen1	HSCGen1	AM4CEC	graph quadratic functions with pencil and paper, and with graphing software
A4.2-2c	–	interpret the turning point and intercepts of a parabola in a practical context					SAME	HSCGen2	AM5	use a graph of a quadratic function to find maximum and minimum values in practical contexts
A4.2-2d	–	consider the range of values for x and y for which the quadratic model makes sense in a practical context					SIMILAR	HSCGen1	AM4CEC	identify the maximum and minimum values of a quadratic function from a prepared graph based on a practical context
A4.2-3	•	recognise that reciprocal functions of the form y = k/x, where k is a constant, represent inverse variation, identify the shape of these graphs and their important features	**AAM**	ICT	ACMMM012	examine examples of inverse proportion	SAME	HSCGen2	AM5	recognise, graph and compare, by completing tables of values, the properties of the graphs of y = ax^2 + c, y = ax^3 + c, y = a/x, y = b(a^x)
							SAME	HSCGen2	AM5	develop equations such as y = a/x from descriptions of situations in which one quantity varies inversely with another
A4.2-3a	–	use a reciprocal model to solve practical inverse variation problems algebraically and graphically, for example, the amount of pizza received when sharing a pizza between increasing numbers of people			ACMMM013	recognise features of the graphs of y=1xy=1x and y=ax−by=ax-b, including their hyperbolic shapes, and their asymptotes.				
TOPIC		**Measurement**								
SUBTOPIC	MS-M6	Non-right-angled Trigonometry				***Overview:*** SAME			***GENERAL:***	MM5
M6-1	•	review and use the trigonometric ratios to find the length of an unknown side or the size of an unknown angle in a right-angled triangle	**AAM**		ACMGM034	review the use of the trigonometric ratios to find the length of an unknown side or the size of an unknown angle in a right-angled triangle	from Prelim	Prelim	MM3	use trigonometric ratios to find an unknown side-length in a right-angled triangle, when the unknown side-length is in the numerator of the ratio to be used
							from Prelim	Prelim	MM3	use trigonometric ratios to find the size of an unknown angle in a right-angled triangle, correct to the nearest degree

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	M6-2	•	determine the area of any triangle, given two sides and an included angle, by using the rule Area = ½absinC or given three sides by Heron's Formula, and solve related practical problems	**AAM**	ICT	ACMGM035	determine the area of a triangle given two sides and an included angle by using the rule Area = (1/2)absinC, or given three sides by using Heron's rule, and solve related practical problems	SAME	HSCGen2	MM5	calculate the area of a triangle using the formula A = ½ ab sin C
								NEW			
	M6-3	•	solve problems involving non-right-angled triangles using the sine rule (ambiguous case excluded) and the cosine rule	**AAM**		ACMGM036	solve problems involving non-right-angled triangles using the sine rule (ambiguous case excluded) and the cosine rule	SAME	HSCGen2	MM5	use the sine rule to find side lengths and angles of triangles
								SAME	HSCGen2	MM5	use the cosine rule to find side lengths and angles of triangles
	M6-4	•	understand various navigational methods								
	M6-4a	–	understand the difference between compass and true bearings					SAME	HSCGen2	MM5	use compass bearings (eight points only) and true bearings (three-figure bearings) in problem-solving related to maps and charts
	M6-4b	–	investigate navigational methods used by different cultures, including but not limited to those of Aboriginal and Torres Strait Islander peoples		ATSI,CCT			NEW			
	M6-5	•	solve practical problems involving Pythagoras' Theorem, the trigonometry of right and non-right angled triangles, angles of elevation and depression and the use of true bearings and compass bearings	**AAM**	CCT	ACMGM037	solve practical problems involving the trigonometry of right-angled and non-right-angled triangles, including problems involving angles of elevation and depression and the use of bearings in navigation.	SAME	HSCGen2	MM5	solve problems using trigonometric ratios in one or more right-angled triangles
								SAME	HSCGen2	MM5	select and use appropriate trigonometric ratios and formulae to solve problems involving right-angled and non-right-angled triangles
	M6-5a	–	work with angles correct to the nearest degree and/or minute					NEW			
	M6-6	•	construct and interpret compass radial surveys and solve related problems		ICT,LIT,CC			SAME	HSCGen2	MM5	conduct radial (both plane table and compass) surveys
								SAME	HSCGen2	MM5	solve problems involving non-right-angled triangle trigonometry, Pythagoras' theorem, and area in offset and radial surveys
SUBTOPIC	MS-M7		Rates and Ratios				***Overview:*** SAME/GEN1/PRELIM			***GENERAL:***	MM1,FS
	M7-1	•	use rates to solve and describe practical problems	**AAM**		ACMEM073	complete calculations with rates, including solving problems involving direct proportion in terms of rate.	SIMILAR	Prelim	MM1	calculate rates, including pay rates, rates of flow, and rates of speed
	M7-1a	–	use rates to make comparisons, for example using unit prices to compare best buys, working with speed, comparing heart rates after exercise and considering Targeted Heart Rate ranges during training		CCT,ICT,PSC	ACMEM074	use rates to make comparisons	SIMILAR	Prelim	MM1	convert between units for rates, eg km/h to m/s, mL/min to L/h
								from Gen1	HSCGen1	FSHu1CEC	describe heart rate as a rate expressed in beats per minute

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
							from Gen1	HSCGen1	FSHu1CEC	measure and graph a person's heart rate over time under different conditions, eg at rest, during exercise, and after exercise
							from Gen1	HSCGen1	FSHu1CEC	identify mathematical trends in heart rate over time under different conditions
							from Gen1	HSCGen1	FSHu1CEC	calculate the total number of heart beats over a given time under different conditions
							from Gen1	HSCGen1	FSHu1CEC	calculate Targeted Heart Rate ranges during training
M7-1b	–	know that a watt (W) is the International System of Units (SI) derived unit of power and is equal to one joule per second					NEW			
M7-1c	–	interpret the energy rating of household appliances and compare running costs of different models of the same type of appliance, considering costs of domestic electricity, for example calculate the cost of running a 200-watt television for six hours if the average peak rate for domestic electricity is $0.15/kWh		S			SAME	HSCGen2	FSRe3	calculate the cost of running different household appliances for various time periods, given the power rating, usage time, and cost of power
							SAME	HSCGen2	FSRe3	interpret the energy rating of appliances and compare running costs of different models of the same type of appliance
M7-1d	–	investigate local council requirements for energy-efficient housing		S			SAME	HSCGen2	FSRe3	investigate local council requirements for energy-efficient housing
							SAME	HSCGen2	FSRe3	calculate building sustainability measures based on the requirements of the Building Sustainability Index (BASIX) Certificate
							SAME	HSCGen2	FSRe3	identify the issues addressed in the BASIX, eg area of site, water, thermal comfort and energy
M7-1e	–	calculate the amount of fuel used on a trip, given the fuel consumption rate, and compare fuel consumption statistics for various vehicles					from Prelim	Prelim	FSDr2	identify fuel consumption measures as rates
							from Prelim	Prelim	FSDr2	compare fuel consumption statistics for various vehicles
M7-2	•	solve practical problems involving ratio, for example, map scales, mixtures for building materials or cost per item	**AAM**	CCT,ICT						
M7-2a	–	work with ratio to express a ratio in simplest form, to find the ratio of two quantities and to divide a quantity in a given ratio			ACMEM065	demonstrate an understanding of the elementary ideas and notation of ratio	from Prelim	Prelim	MM1	calculate with ratios, including finding the ratio of two quantities, dividing quantities in a given ratio, and using the unitary method to solve problems
					ACMEM066	understand the relationship between fractions and ratio				
					ACMEM067	express a ratio in simplest form				
					ACMEM068	find the ratio of two quantities				
					ACMEM069	divide a quantity in a given ratio				
M7-2b	–	use ratio to describe map scales			ACMEM070	use ratio to describe simple scales.				

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	M7-3	•	obtain measurements from scale drawings, including but not limited to maps (including cultural mappings or models) or building plans, to solve problems	**AAM**	ATSI,CCT	ACMGM023	obtain measurements from scale drawings, such as maps or building plans, to solve problems	from Prelim	Prelim	MM3	calculate measurements from scale diagrams
	M7-3a	–	interpret commonly used symbols and abbreviations on building plans and elevation views		LIT	ACMEM108	interpret commonly used symbols and abbreviations in scale drawings	from Gen1	HSCGen1	FSDe1CEC	interpret common symbols and abbreviations on house plans
	M7-3b	–	calculate the perimeter or area of a section of land, using the Trapezoidal rule where appropriate, from a variety of sources, including but not limited to a site plan, an aerial photograph, radial surveys or maps that include a scale		ICT	ACMGM024	obtain a scale factor and use it to solve scaling problems involving the calculation of the areas of similar figures	SIMILAR	HSCGen2	FSRe2	calculate the perimeter of a section of land using a site plan or aerial photograph that includes a scale
								SIMILAR	HSCGen2	FSRe2	calculate actual areas using scale diagrams
	M7-3c	–	calculate the volume of rainfall over an area, using , from a variety of sources, including but not limited to a site plan, an aerial photograph, radial surveys or maps that include a scale		ICT	ACMGM025	obtain a scale factor and use it to solve scaling problems involving the calculation of surface areas and volumes of similar solids.	from Gen1	HSCGen1	FSPe1CEC	calculate the volume of water collected, based on a catchment area, using V = Ah
								SIMILAR	HSCGen2	FSRe2	estimate the area of land and catchment areas
								SIMILAR	HSCGen2	FSRe2	calculate the volume of rainfall using V = Ah
TOPIC			**Financial Mathematics**								
SUBTOPIC	MS-F4		Investments and Loans				***Overview:*** PRELIM			***GENERAL:***	FM2,FS
CONTENT	F4.1		Investments								
	F4.1-1	•	calculate the future value or present value and the interest rate (r) of a compound interest investment using the formula FV = PV(1 + r)^n		ICT	ACMEM171	use technology to calculate the future value of a compound interest loan or investment and the total interest paid or earned	from Prelim	Prelim	FM2	calculate the final amount, interest and principal using the compound interest formula A = P(1 + r)n, where
	F4.1-1a	–	compare the growth of simple interest and compound interest investments numerically and graphically, linking graphs to linear and exponential modelling using digital technology		CCT,ICT	ACMEM172	use technology to compare, numerically and graphically, the growth of simple interest and compound interest loans and investments	NEW			
	F4.1-1b	–	investigate the effect of varying the interest rate, the term or the compounding period on the future value of an investment, using digital technology		ICT	ACMEM173	use technology to investigate the effect of the interest rate and the number of compounding periods on the future value of a loan or investment.				
	F4.1-1c	–	compare and contrast different investment strategies performing appropriate calculations when needed		CCT			from Prelim	Prelim	FM2	compare different investment strategies
	F4.1-2	•	solve practical problems involving compounding, for example determine the impact of inflation on prices and wages	**AAM**	ICT,PSC	ACMEM170	consider similar problems involving compounding; for example, population growth	from Prelim	Prelim	FM2	calculate the price of goods following inflation
								from Prelim	Prelim	FM2	investigate the effect of inflation on prices.
	F4.1-3	•	work with shares and calculate the appreciated value of items, for example, antiques	**AAM**	ICT,PSC	ACMEM170	consider similar problems involving compounding; for example, population growth	from Prelim	Prelim	FM2	calculate the appreciated value of items, eg stamp collections and other memorabilia
	F4.1-3a	–	record and graph the price of a share over time					from Prelim	Prelim	FM2	record and graph the price of a share over time

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	F4.1-3b	–	calculate the dividend paid on a portfolio of shares, and the dividend yield (excluding franked dividends)			ACMGM008	calculate the dividend paid on a portfolio of shares, given the percentage dividend or dividend paid per share, for each share; and compare share values by calculating a price-to-earnings ratio	from Prelim	Prelim	FM2	calculate the dividend paid on a shareholding and the dividend yield (excluding franked dividends)
CONTENT	F4.2		Depreciation and loans								
	F4.2-1	•	calculate the depreciation of an asset using the declining-balance method, as an application of the compound interest formula	**AAM**				from Prelim	Prelim	FSDr2	calculate the depreciation of a vehicle using the straight-line method and the declining balance method
	F4.2-2	•	solve practical problems involving reducing balance loans, for example determining the total loan amount and monthly repayments	**AAM**	ICT,CC	ACMGM098	with the aid of a financial calculator or computer-based financial software, solve problems involving reducing balance loans; for example, determining the monthly repayments required to pay off a housing loan.	from Prelim	Prelim	FSDr1	determine the monthly repayments on a reducing balance personal loan using tables or an online calculator
	F4.2-3	•	recognise credit cards as an example of a reducing balance loan and solve practical problems relating to credit cards	**AAM**				DIFFERENT	HSCGen2	FM4	calculate credit card payments, interest charges, and balances
	F4.2-3a	–	identify the various fees and charges associated with credit card usage		LIT,PSC			from Gen1	HSCGen1	FM4CEC	identify the various fees and charges associated with credit card usage, including interest charges, annual card fees, and late payment fees, and how they are calculated
	F4.2-3b	–	compare credit card interest rates with interest rates for other loan types		CC			NEW			
	F4.2-3c	–	interpret credit card statements, recognising the implications of only making the minimum payment		LIT,PSC			NEW			
	F4.2-3d	–	understand what is meant by an interest-free period					NEW			
	F4.2-3e	–	calculate the compounding interest charged on a retail purchase, transaction or the outstanding balance for a given number of days, using digital technology or otherwise		ICT			NEW			
SUBTOPIC	MS-F5		Annuities				***Overview:*** SAME			***GENERAL:***	FM5
	F5-1	•	solve compound interest related problems involving financial decisions, for example, a home loan, a savings account, a car loan or superannuation	**AAM**	CCT,ICT,PSC,CC						
	F5-1a	–	identify an annuity as an investment account with regular, equal contributions and interest compounding at the end of each period, or as a single sum investment from which regular, equal withdrawals are made		PSC			SAME	HSCGen2	FM5	recognise that an annuity is a financial plan involving periodical, equal contributions to an account, with interest compounding at the conclusion of each period
	F5-1b	–	using digital technology, model an annuity as a recurrence relation, and investigate (numerically or graphically) the effect of varying the amount and frequency of each contribution, the interest rate or the payment amount on the duration and/or future value of the annuity		ICT	ACMGM099	use a recurrence relation to model an annuity, and investigate (numerically or graphically) the effect of the amount invested, the interest rate, and the payment amount on the duration of the annuity	new			

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
F5-1c	–	use a table of future value interest factors to perform annuity calculations, for example calculating the future value of an annuity, the contribution amount required to achieve a given future value or the single sum that would produce the same future value as a given annuity		CCT,ICT,PSC	ACMGM100	with the aid of a financial calculator or computer-based financial software, solve problems involving annuities	from Prelim	Prelim	FM2	calculate and compare the final amount, interest and principal using a table of compounded values of one dollar
							SAME	HSCGen2	FM5	calculate (i) the future value of an annuity (FVA) and (ii) the contribution per period, using a table of future value interest factors for calculating a single future value of an annuity stream
TOPIC		**Statistical Analysis**								
SUBTOPIC	MS-S4	Bivariate Data Analysis				***Overview:*** SIMILAR			***GENERAL:***	FSHe
S4-1	•	construct a bivariate scatterplot to identify patterns in the data that suggest the presence of an association	**AAM**	ICT	ACMGM052	construct a scatterplot to identify patterns in the data suggesting the presence of an association	SIMILAR	HSCGen2	FSHe1	plot ordered pairs of body measurement data onto a scatterplot by hand and by using appropriate technology
S4-2	•	use bivariate scatterplots (constructing them when needed) to describe the patterns, features and associations of bivariate datasets, justifying any conclusions	**AAM**		ACMGM056	use a scatterplot to identify the nature of the relationship between variables	SIMILAR	HSCGen2	FSHe1	recognise patterns in a scatterplot of body measurements, eg
							SIMILAR	HSCGen2	FSHe1	- whether the points appear to form a mathematical pattern
S4-2a	–	describe bivariate datasets in terms of form (linear/non-linear) and, in the case of linear, the direction (positive/negative) and strength of any association (strong/moderate/weak)			ACMGM053	describe an association between two numerical variables in terms of direction (positive/negative), form (linear/non-linear) and strength (strong/moderate/weak)	SIMILAR	HSCGen2	FSHe1	- whether the pattern appears to be linear
S4-2b	–	identify the dependent and independent variables within bivariate datasets where appropriate			ACMEM140	identify the dependent and independent variable				
S4-2c	–	describe and interpret a variety of bivariate datasets involving two numerical variables using real-world examples from the media or freely available from government or business datasets		ICT,CC						
S4-2d	–	calculate and interpret Pearson's correlation coefficient (r) using digital technology to quantify the strength of a linear association of a sample		ICT	ACMGM054	calculate and interpret the correlation coefficient (r) to quantify the strength of a linear association.	SIMILAR	HSCGen2	FSHe1	calculate correlation coefficients for different body measurements using appropriate technology (students are not required to calculate correlation coefficients by hand)
							SIMILAR	HSCGen2	FSHe1	interpret the strength of association for different body measurements using
							SIMILAR	HSCGen2	FSHe1	a given correlation coefficient
S4-3	•	model a linear relationship by fitting an appropriate line of best fit to a scatterplot and using it to describe and quantify associations	**AAM**							
S4-3a	–	fit a line of best fit both by eye and by using digital technology to the data		ICT	ACMEM141	find the line of best fit by eye	SIMILAR	HSCGen2	FSHe1	estimate and draw 'by eye' a line of fit on a scatterplot
					ACMEM142	use technology to find the line of best fit				
S4-3b	–	fit a least-squares regression line to the data using digital technology		ICT	ACMGM057	model a linear relationship by fitting a least-squares line to the data	SIMILAR	HSCGen2	FSHe1	interpret the sign of a given correlation coefficient

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	S4-3c	–	interpret the intercept and gradient of the fitted line			ACMGM059	interpret the intercept and slope of the fitted line	SIMILAR	HSCGen2	FSHe1	construct the least-squares line of best fit
	S4-4	•	use the appropriate line of best fit, both found by eye and by applying the equation, to make predictions by either interpolation or extrapolation			ACMGM061	use the equation of a fitted line to make predictions	SIMILAR	HSCGen2	FSHe1	determine the least-squares line of best fit using the correlation coefficient (r), the mean of the x scores, and the mean of the y scores, and the standard deviation of the x scores and the standard deviation of the y scores
						ACMGM062	distinguish between interpolation and extrapolation when using the fitted line to make predictions, recognising the potential dangers of extrapolation	SIMILAR	HSCGen2	FSHe1	use a least-squares line of best fit to interpolate
	S4-4a	–	recognise the limitations of interpolation and extrapolation, and interpolate from plotted data to make predictions where appropriate		ICT			SIMILAR	HSCGen2	FSHe3	interpolate from plotted data to make predictions where appropriate
	S4-5	•	implement the statistical investigation process to answer questions that involve identifying, analysing and describing associations between two numerical variables	**AAM**		ACMGM066	implement the statistical investigation process to answer questions that involve identifying, analysing and describing associations between two categorical variables or between two numerical variables; for example, is there an association between attitude to capital punishment (agree with, no opinion, disagree with) and sex (male, female)? is there an association between height and foot length?	from Prelim	Prelim	DS1	investigate the process of statistical inquiry, and describe the following steps: posing questions, collecting data, organising data, summarising and displaying data, analysing data and drawing conclusions, and writing a report
	S4-5a	–	construct, interpret and analyse scatterplots for bivariate numerical data in practical contexts while demonstrating awareness of issues of privacy and bias, ethics, and responsiveness to diverse groups and cultures		ATSI,AAA, EU,DD,WE	ACMEM133	investigate questionnaire design principles; for example, simple language, unambiguous questions, consideration of number of choices, issues of privacy and ethics, and freedom from bias.				
	S4-5b	–	investigate using biometric data obtained by measuring the body or by accessing published data from sources including government organisations, and determine if any associations exist between identified variables		CCT,ICT			SIMILAR	HSCGen2	FSHe1	investigate biometric data obtained by measuring the body and by accessing published data
SUBTOPIC	MS-S5		The Normal Distribution				***Overview:*** SAME			***GENERAL:***	DS5
	S5-1	•	recognise a random variable that is normally distributed, justifying their reasoning, and draw an appropriate 'bell-shaped' frequency distribution curve to represent it								
	S5-1a	–	identify that the mean and median are approximately equal for data arising from a random variable that is normally distributed					SAME	HSCGen2	DS5	identify properties of data that are normally distributed, eg - the mean, median and mode are equal - if represented by a histogram, the resulting frequency graph is 'bell-shaped'
	S5-2	•	calculate the -score (standardised score) corresponding to a particular value in a dataset	**AAM**							
	S5-2a	–	use the formula z = (x - x-bar)/s to calculate z-scores, where x-bar is the mean and s is the standard deviation		ICT			SAME	HSCGen2	DS5	use the formula z=(x-xbar)/s to calculate z-scores, where s is the standard deviation

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	S5-2b	–	describe the z-score as the number of standard deviations a value lies above or below the mean					SAME	HSCGen2	DS5	describe the z-score (standardised score) corresponding to a particular score in a set of scores as a number indicating the position of that score relative to the mean
	S5-2c	–	recognise that the set of z-scores for data arising from a random variable that is normally distributed has a mean of 0 and standard deviation of 1								
	S5-3	•	use calculated -scores to compare scores from different datasets, for example comparing students' subject examination scores	**AAM**				SAME	HSCGen2	DS5	use calculated z-scores to compare scores from different data sets
	S5-4	•	use collected data to illustrate that, for normally distributed random variables, approximately 68% of data will have z-scores between -1 and 1, approximately 95% of data will have -scores between -2 and 2 and approximately 99.7% of data will have -scores between -3 and 3 (known as the empirical rule)					SAME	HSCGen2	DS5	use collected data to illustrate that for normally distributed data - approximately 68% of scores will have z-scores between -1 and 1 - approximately 95% of scores will have z-scores between -2 and 2 - approximately 99.7% of scores will have z-scores between -3 and 3
	S5-4a	–	apply the empirical rule to a variety of problems								
	S5-4b	–	indicate by shading where results sit within the normal distribution, for example, where the top 10% of data lies								
	S5-4	•	use z-scores to identify probabilities of events less or more extreme than a given event AAM	**AAM**							
	S5-5	•	use z-scores to make judgements related to outcomes of a given event or sets of data AAM	**AAM**				SAME	HSCGen2	DS5	use these measures to make judgements in individual cases
TOPIC			**Networks**								
SUBTOPIC	MS-N2		Network Concepts				***Overview:*** NEW				***GENERAL:***
CONTENT	N2.1		Networks								
	N2.1-1	•	identify and use network terminology, including vertices, edges, paths, the degree of a vertex, directed networks and weighted edges		ICT,LIT	ACMGM078	explain the meanings of the terms: graph, edge, vertex, loop, degree of a vertex, subgraph, simple graph, complete graph, bipartite graph, directed graph (digraph), arc, weighted graph, and network	NEW			
						ACMGM083	explain the meaning of the terms walk, trail, path, closed walk, closed trail, cycle, connected graph, and bridge				
	N2.1-2	•	solve problems involving network diagrams AAM	**AAM**				NEW			
	N2.1-2a	–	recognise circumstances in which networks could be used, for example the cost of connecting various locations on a university campus with computer cables (ACMGM079)		CCT,CC			NEW			
	N2.1-2b	–	given a map, draw a network to represent the map, for example travel times for the stages of a planned journey		CCT			NEW			
	N2.1-2c	–	draw a network diagram to represent information given in a table					NEW			

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	N2.1-2d	–	investigate and solve practical problems, for example the Königsberg Bridge problem or planning a garbage bin collection route			ACMGM085	explain the meaning of the terms Eulerian graph, Eulerian trail, semi-Eulerian graph, semi-Eulerian trail and the conditions for their existence, and use these concepts to investigate and solve practical problems; for example, the Königsberg Bridge problem, planning a garbage bin collection route	NEW			
CONTENT	N2.2		Shortest paths								
	N2.2-1	•	determine the minimum spanning tree of a given network with weighted edges	**AAM**		ACMGM101	explain the meaning of the terms tree and spanning tree identify practical examples	NEW			
						ACMGM102	identify a minimum spanning tree in a weighted connected graph either by inspection or by using Prim's algorithm				
	N2.2-1a	–	determine the minimum spanning tree by using Kruskal's or Prim's algorithms or by inspection					NEW			
	N2.2-1b	–	determine the definition of a tree and a minimum spanning tree for a given network					NEW			
	N2.2-1c	–	use minimum spanning trees to solve minimal connector problems, for example minimising the length of cable needed to provide power from a single power station to substations in several towns		ICT	ACMGM103	use minimal spanning trees to solve minimal connector problems; for example, minimising the length of cable needed to provide power from a single power station to substations in several towns.	NEW			
	N2.2-2	•	find the shortest path from one place to another in a network with no more than 10 vertices	**AAM**	CCT			NEW			
	N2.2-2a	–	identify the shortest path on a network diagram			ACMGM084	investigate and solve practical problems to determine the shortest path between two vertices in a weighted graph (by trial-and-error methods only)	NEW			
	N2.2-2b	–	recognise a circumstance in which a shortest path is not necessarily the best path or contained in any spanning tree □		CCT			NEW			
SUBTOPIC	MS-N3		Critical Path Analysis				***Overview:*** NEW				***GENERAL:***
	N3-1	•	construct a network to represent the duration and interdependencies of activities that must be completed during a particular project, for example a student schedule, or preparing a meal	**AAM**	CT,ICT,LIT, PSC	ACMGM104	construct a network to represent the durations and interdependencies of activities that must be completed during the project; for example, preparing a meal	NEW			
	N3-2	•	given activity charts, prepare network diagrams and use critical path analysis to determine the minimum time for a project to be completed	**AAM**		ACMGM107	use the critical path to determine the minimum time for a project to be completed	NEW			
	N3-2a	–	use forward and backward scanning to determine the earliest starting time (EST) and latest starting time (LST) for each activity in a project					NEW			
	N3-2b	–	understand why the EST for an activity could be zero, and in what circumstances it would be greater than zero		LIT	ACMGM105	use forward and backward scanning to determine the earliest starting time (EST) and latest starting times (LST) for each activity in the project	NEW			
	N3-2c	–	calculate float times of non-critical activities		LIT	ACMGM108	calculate float times for non-critical activities.	NEW			
	N3-2d	–	understand what is meant by critical path					NEW			

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	N3-2e	–	use ESTs and LSTs to locate the critical path(s) for the project			ACMGM106	use ESTs and LSTs to locate the critical path(s) for the project	NEW			
	N3-3	•	solve small-scale network flow problems, including the use of the 'maximum-flow minimum-cut' theorem, for example determining the maximum volume of oil that can flow through a network of pipes from an oil storage tank (the source) to a terminal (the sink)	**AAM**		ACMGM109	solve small-scale network flow problems including the use of the 'maximum-flow minimum- cut' theorem; for example, determining the maximum volume of oil that can flow through a network of pipes from an oil storage tank (the source) to a terminal (the sink)	NEW			
	N3-3a	–	convert information presented in a table into a network diagram					NEW			
	N3-3b	–	determine the flow capacity of a network and whether the flow is sufficient to meet the demand in various contexts					NEW			
COURSE	Mathematics Standard 1 Year 12										
TOPIC			**Algebra**								
SUBTOPIC	MS-A3		Types of Relationships				***Overview:*** SAME/NEW		***GENERAL:***	AM4CEC	
CONTENT	A3.1		Simultaneous linear equations								
	A3.1-1	•	solve a pair of simultaneous linear equations graphically, by finding the point of intersection between two straight-line graphs, using digital technology		ICT	ACMGM044	solve a pair of simultaneous linear equations, using technology when appropriate	from Prelim	Prelim	AM2	sketch the graphs of a pair of linear equations to find the point of intersection
	A3.1-2	•	develop a pair of simultaneous linear equations to model a practical situation	**AAM**	CCT,ICT	ACMGM039	develop a linear formula from a word description				
	A3.1-3	•	solve practical problems that involve finding the point of intersection of two straight-line graphs, for example determine and interpret the break-even point of a simple business problem where cost and revenue are represented by linear equations	**AAM**	WE	ACMGM045	solve practical problems that involve finding the point of intersection of two straight-line graphs; for example, determining the break-even point where cost and revenue are represented by linear equations	SAME	HSCGen1	AM4CEC	interpret the point of intersection and other important features of given graphs of two linear functions drawn from practical contexts, eg break-even point
CONTENT	A3.2		Graphs of practical situations								
	A3.2-1	•	construct a graph from a table of values both with and without digital technology		ICT			SAME	HSCGen1	AM4CEC	generate tables of values for linear functions (including for negative values of x)
								SAME	HSCGen1	AM4CEC	graph linear functions for all values of x with pencil and paper, and with graphing software
	A3.2-1a	–	use values of physical phenomena, for example the growth of algae in a pond over time, or the rise and fall of the tide against a harbour wall over time to plot graphs and make predictions								
	A3.2-2	•	sketch the shape of a graph from a description of a situation, for example the time passed and the depth of water in different shaped containers, or the speed of a race car as it moves around different shaped tracks		CCT						

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	A3.2-3	•	determine the best model (linear or exponential) to approximate a graph by considering its shape, using digital technology where appropriate	**AAM**	CCT,ICT			NEW			
	A3.2-4	•	identify the strengths and limitations of linear and non-linear models in given practical contexts	**AAM**	CCT			SIMILAR	HSCGen1	AM4CEC	use linear and quadratic functions to model physical phenomena
TOPIC			**Measurement**								
SUBTOPIC	MS-M3		Right-angled Triangles				***Overview:*** PRELIM			***GENERAL:***	MM3,MM5
	M3-1	•	review the application of Pythagoras' theorem to solve practical problems in two dimensions	**AAM**	CCT,LIT	ACMGM017	review Pythagoras' Theorem and use it to solve practical problems in two dimensions and for simple applications in three dimensions.				
	M3-2	•	review and extend the use of trigonometric ratios (sin, cos, tan) to solve practical problems	**AAM**		ACMGM034	review the use of the trigonometric ratios to find the length of an unknown side or the size of an unknown angle in a right-angled triangle	from Prelim	Prelim	MM3	recognise that the ratio of matching sides in similar right-angled triangles is constant for equal angles
								from Prelim	Prelim	MM3	calculate sine, cosine and tangent ratios
								from Prelim	Prelim	MM3	use trigonometric ratios to find an unknown side-length in a right-angled triangle, when the unknown side-length is in the numerator of the ratio to be used
								from Prelim	Prelim	MM3	use trigonometric ratios to find the size of an unknown angle in a right-angled triangle, correct to the nearest degree
								from Prelim	Prelim	MM3	determine whether an answer seems reasonable by considering proportions within the triangle under consideration
								SIMILAR	Prelim	MM3	solve practical problems using scale diagrams and factors, similarity and trigonometry.
	M3-2a	–	work with angles correct to the nearest degree and/or minute								
	M3-3	•	understand various navigational methods								
	M3-3a	–	understand the difference between compass and true bearings					SAME	HSCGen2	MM5	use compass bearings (eight points only) and true bearings (three-figure bearings) in problem-solving related to maps and charts
	M3-3b	–	investigate navigational methods used by different cultures, including but not limited to those of Aboriginal and Torres Strait Islander peoples		ATSI,CCT						
	M3-4	•	solve practical problems involving angles of elevation and depression and bearings	**AAM**	CCT,ICT,LIT	ACMEM118	work with the concepts of angle of elevation and angle of depression	from Prelim	Prelim	MM3	calculate angles of elevation and depression, given the appropriate diagram
						ACMEM120	solve problems involving bearings.				
	M3-4a	–	convert between compass and true bearings, for example convert N35°W into a true bearing					from Gen2	HSCGen2	MM5	use compass bearings (eight points only) and true bearings (three-figure bearings) in problem-solving related to maps and charts
SUBTOPIC	MS-M4		Rates				***Overview:*** PRELIM/Gen1/SAME			***GENERAL:***	FS

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
M4-1	•	use, simplify and convert between units of rates, for example km/h and m/s, mL/min and L/h			ACMEM071	review identifying common usage of rates such as km/h				
					ACMEM072	convert between units for rates; for example, km/h to m/s, mL/min to L/h	from Prelim	Prelim	MM1	convert between units for rates, eg km/h to m/s, mL/min to L/h
M4-2	•	use rates to solve practical problems	**AAM**		ACMEM014	identify common usage of rates; for example, km/h as a rate to describe speed, beats/minute as a rate to describe pulse				
					ACMEM015	convert units of rates occurring in practical situations to solve problems				
					ACMEM073	complete calculations with rates, including solving problems involving direct proportion in terms of rate.				
M4-2a	–	use rates to make comparisons, for example using unit prices to compare best buys, comparing heart rates after exercise		CCT,PSC,CC	ACMEM016	use rates to make comparisons; for example, using unit prices to compare best buys, comparing heart rates after exercise.	from Gen1	HSCGen1	FSHu1CEC	describe heart rate as a rate expressed in beats per minute
					ACMEM074	use rates to make comparisons	from Gen1	HSCGen1	FSHu1CEC	identify mathematical trends in heart rate over time under different conditions
							from Gen1	HSCGen1	FSHu1CEC	calculate the total number of heart beats over a given time under different
M4-2b	–	use rates to determine costs, for example calculating the cost of a trade professional using rates per hour and call-out fees		CCT,PSC,CC	ACMEM075	use rates to determine costs; for example, calculating the cost of a tradesman using rates per hour, call-out fees.	from Prelim	Prelim	MM1	calculate rates, including pay rates, rates of flow, and rates of speed
M4-2c	–	work with speed as a rate, including interpreting distance-time graphs (travel graphs) and use them to solve problems related to speed, distance and time		CCT,ICT,LIT	ACMEM085	identify the appropriate units for different activities, such as walking, running, swimming and flying	from Prelim	Prelim	FSDr3	calculate distance, speed and time, given two of the three quantities (with change of units of measurement as required)
					ACMEM086	calculate speed, distance or time using the formula speed = distance/time				
					ACMEM087	calculate the time or costs for a journey from distances estimated from maps				
					ACMEM088	interpret distance-versus-time graphs				
M4-2d	–	calculate the amount of fuel used on a trip, given the fuel consumption rate, and compare fuel consumption statistics for various vehicles					from Prelim	Prelim	FSDr2	identify fuel consumption measures as rates
							from Prelim	Prelim	FSDr2	calculate the amount of fuel used on a trip
							from Prelim	Prelim	FSDr2	compare fuel consumption statistics for various vehicles
							from Prelim	Prelim	FSDr2	compare the amount of fuel needed and associated costs for various sizes, makes and models of vehicles, over various distances
M4-3	•	solve problems involving heart rates and blood pressure	**AAM**							
M4-3a	–	describe heart rate as a rate expressed in beats per minute					SAME	HSCGen1	FSHu1CEC	describe heart rate as a rate expressed in beats per minute

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	M4-3b	–	measure and graph a person's heart rate over time under different conditions and identify mathematical trends		PSC			SAME	HSCGen1	FSHu1CEC	measure and graph a person's heart rate over time under different conditions, eg at rest, during exercise, and after exercise
								SAME	HSCGen1	FSHu1CEC	identify mathematical trends in heart rate over time under different conditions
								INFERRED	HSCGen1	FSHu1CEC	calculate the total number of heart beats over a given time under different conditions
	M4-3c	–	calculate Target Heart Rate ranges during training		PSC			SAME	HSCGen1	FSHu1CEC	calculate Targeted Heart Rate ranges during training
	M4-3d	–	express blood pressure using measures of systolic pressure and diastolic pressure					SAME	HSCGen1	FSHu1CEC	express blood pressure using measures of systolic pressure and diastolic pressure
	M4-3e	–	measure blood pressure over time and under different conditions					SAME	HSCGen1	FSHu1CEC	measure blood pressure over time and under different conditions
	M4-3f	–	use a blood pressure chart and interpret the 'healthiness' of a reading		PSC			SAME	HSCGen1	FSHu1CEC	read a blood pressure chart and interpret the 'healthiness' of a reading
SUBTOPIC	MS-M5		Scale Drawings				***Overview:*** HSC			***GENERAL:***	FS
	M5-1	•	solve practical problems involving ratio, for example, map scales, mixtures for building materials or cost per item AAM	**AAM**	CCT,ICT			from Prelim	Prelim	MM1	calculate with ratios, including finding the ratio of two quantities, dividing quantities in a given ratio, and using the
	M5-1a	–	work with ratio to express a ratio in simplest form, to find the ratio of two quantities and to divide a quantity in a given ratio			ACMEM065	demonstrate an understanding of the elementary ideas and notation of ratio				
						ACMEM066	understand the relationship between fractions and ratio				
						ACMEM067	express a ratio in simplest form				
						ACMEM068	find the ratio of two quantities				
						ACMEM069	divide a quantity in a given ratio				
	M5-1b	–	use ratio to describe map scales			ACMEM070	use ratio to describe simple scales.				
	M5-2	•	use the conditions for similarity of two-dimensional figures, including similar triangles, to solve related problems			ACMGM021	review the conditions for similarity of two-dimensional figures including similar triangles	SIMILAR	HSCGen1	FSDe2CEC	recognise and apply similarity to calculate lengths and areas of regular and irregular plane shapes
	M5-3	•	use the linear scale factor for two similar figures to solve problems			ACMGM022	use the scale factor for two similar figures to solve linear scaling problems	from Prelim	Prelim	MM3	calculate scale factors for similar figures
								from Prelim	Prelim	MM3	use scale factor to solve problems involving similar figures
	M5-4	•	obtain measurements from scale drawings, including but not limited to maps (including cultural mappings or models) or building plans, to solve problems	**AAM**	ATSI,CCT	ACMGM023	obtain measurements from scale drawings, such as maps or building plans, to solve problems	SAME	HSCGen1	FSDe1CEC	use the scale on a plan, design or map to calculate actual dimensions, and vice versa
								SAME	HSCGen1	FSDe1CEC	interpret plan views and elevation views to obtain internal dimensions of rooms
	M5-4a	–	interpret commonly used symbols and abbreviations on building plans and elevation views		LIT	ACMEM108	interpret commonly used symbols and abbreviations in scale drawings	SIMILAR	HSCGen1	FSDe1CEC	interpret common symbols and abbreviations on house plans

		Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
M5-5	•	estimate and compare quantities, materials and costs using actual measurements from scale drawings, for example using measurements for packaging, clothing, cooking, painting, bricklaying and landscaping including sustainability issues	**AAM**	S,PSC	ACMEM110	estimate and compare quantities, materials and costs using actual measurements from scale drawings; for example, using measurements for packaging, clothes, painting, bricklaying and landscaping.	SIMILAR	HSCGen1	FSPe3CEC	calculate building sustainability measures based on the requirements of the Building Sustainability Index (BASIX) Certificate
							SIMILAR	HSCGen1	FSPe3CEC	calculate garden and lawn area, including low and high water-use areas
							SIMILAR	HSCGen1	FSPe3CEC	calculate the floor area of a building from a plan
							SIMILAR	HSCGen1	FSHo2CEC	calculate the amount of floor covering required for a room
TOPIC		**Financial Mathematics**								
SUBTOPIC MS-F2		Investment				***Overview:*** PRELIM			***GENERAL:***	FM2
F2-1	•	calculate the future value or present value and the interest rate of a compound interest investment using the formula FV = PV(1 + r)^n		ICT	ACMEM171	use technology to calculate the future value of a compound interest loan or investment and the total interest paid or earned	from Prelim	Prelim	FM2	calculate the final amount, interest and principal using the compound interest formula A = P(1 + r)n, where
F2-1a	–	compare the growth of simple interest and compound interest investments numerically and graphically, using digital technology		CCT,ICT	ACMEM172	use technology to compare, numerically and graphically, the growth of simple interest and compound interest loans and investments				
F2-1b	–	investigate the effect of varying the interest rate, the term or the compounding period on the future value of an investment, using digital technology		ICT	ACMEM173	use technology to investigate the effect of the interest rate and the number of compounding periods on the future value of a loan or investment.				
F2-1c	–	compare and contrast different investment strategies performing appropriate calculations when needed		CCT,PSC, WE						
F2-2	•	solve practical problems involving compounding, for example determine the impact of inflation on prices and wages or calculate the appreciated value of items, for example, antiques	**AAM**	ICT,PSC,WE	ACMEM170	consider similar problems involving compounding; for example, population growth	from Prelim	Prelim	FM2	calculate the price of goods following inflation
							from Prelim	Prelim	FM2	calculate the appreciated value of items, eg stamp collections and other memorabilia
SUBTOPIC MS-F3		Depreciation and Loans				***Overview:*** PRELIM,SIMILAR			***GENERAL:***	FM4CEC,FS
F3-1	•	calculate the depreciation of an asset using the declining-balance method, and realise that this is the compound interest formula, with a negative value for r	**AAM**	CCT			from Prelim	Prelim	FSDr2	calculate the depreciation of a vehicle using the straight-line method and the declining-balance method
F3-1a	–	use digital technology to investigate depreciating values, numerically and graphically		CCT,ICT						
F3-2	•	recognise a reducing balance loan as a compound interest loan with periodic repayments and use a spreadsheet to model a reducing balance loan		ICT,PSC	ACMEM174	use technology and a recurrence relation to model a reducing balance loan	from Prelim	Prelim	FSDr1	determine the monthly repayments on a reducing balance personal loan using tables or an online calculator
F3-2a	–	recognise that a smaller or additional repayment may affect the term and cost of your loan		PSC						

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	F3-2b	–	use an online calculator to investigate the effect of the interest rate, the repayment amount or the making of an additional lump-sum payment, on the time taken to repay a loan		ICT,PSC	ACMEM175	investigate the effect of the interest rate and repayment amount on the time taken to repay a loan.				
	F3-3	•	recognise credit cards as an example of a reducing balance loan and solve practical problems relating to credit cards					SIMILAR	Prelim	FSDr1	determine the monthly repayments on a reducing balance personal loan using tables or an online calculator
	F3-3a	–	identify the various fees and charges associated with credit card usage		LIT,PSC			SAME	HSCGen1	FM4CEC	identify the various fees and charges associated with credit card usage, including interest charges, annual card fees, and late payment fees, and how they are calculated
	F3-3b	–	compare credit card interest rates with interest rates for other loans		PSC						
	F3-3c	–	interpret credit card statements, recognising the implications of only making the minimum payment		LIT,PSC			SIMILAR	HSCGen1	FM4CEC	interpret credit card statements and carry out related calculations
	F3-3d	–	understand what is meant by an interest-free period								
	F3-3e	–	calculate the compounding interest charged on a retail purchase, transaction or the outstanding balance for a given number of days, both with and without the use of digital technology	**AAM**	ICT						
TOPIC			**Statistical Analysis**								
SUBTOPIC	MS-S3		Further Statistical Analysis				***Overview:*** PRELIM			***GENERAL:***	DS1
CONTENT	S3.1		The statistical investigation process for a survey								
	S3.1-1	•	understand and use the statistical investigation process: identifying a problem and posing a statistical question, collecting or obtaining data, representing and analysing that data, then communicating and interpreting findings			ACMGM026	review the statistical investigation process; for example, identifying a problem and posing a statistical question, collecting or obtaining data, analysing the data, interpreting and communicating the results.	from Prelim	Prelim	DS1	investigate the process of statistical inquiry, and describe the following steps: posing questions, collecting data, organising data, summarising and displaying data, analysing data and drawing conclusions, and writing a report
	S3.1-1a	–	identify the target population to be represented			ACMEM132	identify the target population to be surveyed		Prelim	DS1	identify the target population to be investigated
	S3.1-1b	–	investigate questionnaire design principles, for example simple language, unambiguous questions, consideration of number of choices, how data may be analysed to address the original question, issues of privacy and bias, ethics, and responsiveness to diverse groups and cultures	**AAM**	ATSI,AAA, EU,DD,WE	ACMEM133	investigate questionnaire design principles; for example, simple language, unambiguous questions, consideration of number of choices, issues of privacy and ethics, and freedom from bias.				
	S3.1-1c	–	implement the statistical investigation process to answer questions that involve comparing the data across two or more groups		CCT,ICT	ACMGM033	implement the statistical investigation process to answer questions that involve comparing the data for a numerical variable across two or more groups; for example, are Year 11 students the fittest in the school?				
CONTENT	S3.2		Exploring and describing data arising from two quantitative variables								

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	S3.2-1	•	construct a bivariate scatterplot to identify patterns in the data that suggest the presence of an association	**AAM**	ICT	ACMGM052	construct a scatterplot to identify patterns in the data suggesting the presence of an association	SIMILAR	HSCGen2	FSHe1	plot ordered pairs of body measurement data onto a scatterplot by hand and by using appropriate technology
	S3.2-2	•	use bivariate scatterplots (constructing them when needed) to describe the patterns, features and associations of bivariate datasets, justifying any conclusions	**AAM**		ACMGM056	use a scatterplot to identify the nature of the relationship between variables	SIMILAR	HSCGen2	FSHe1	recognise patterns in a scatterplot of body measurements, eg
								SIMILAR	HSCGen2	FSHe1	- whether the points appear to form a mathematical pattern
	S3.2-2a	–	describe bivariate datasets in terms of form (linear/non-linear) and, in the case of linear, the direction (positive/negative) and strength of any association (strong/moderate/weak)			ACMGM053	describe an association between two numerical variables in terms of direction (positive/negative), form (linear/non-linear) and strength (strong/moderate/weak)	SIMILAR	HSCGen2	FSHe1	- whether the pattern appears to be linear
	S3.2-2b	–	identify the dependent and independent variables within bivariate datasets where appropriate			ACMEM140	identify the dependent and independent variable				
	S3.2-2c	–	describe and interpret a variety of bivariate datasets involving two numerical variables using real-world examples from the media, or freely available from government and business datasets		ICT,CC						
	S3.2-3	•	model a linear relationship to the data by fitting a line of best fit by eye and by using digital technology	**AAM**	ICT	ACMEM141	find the line of best fit by eye	SAME	HSCGen1	FSHu2CEC	construct a line of fit and determine the equation, by hand and by using appropriate technology
						ACMEM142	use technology to find the line of best fit				
	S3.2-4	•	use the line of best fit to make predictions by either interpolation or extrapolation	**AAM**	ICT	ACMEM145	use the line of best fit to make predictions, both by interpolation and extrapolation	SIMILAR	HSCGen1	FSHu2CEC	use the equation of a line of fit to make predictions about body measurements
	S3.2-4a	–	recognise the limitations of interpolation and extrapolation			ACMEM146	recognise the dangers of extrapolation	SIMILAR	HSCGen1	FSHu2CEC	recognise the practical limitations of the equation of a line of fit
	S3.2-5	•	collect data, interpret and construct graphs using contexts, for example, sustainability, household finance and the human body	**AAM**	S,PSC						
TOPIC			**Networks**								
SUBTOPIC	MS-N1		Networks and Paths								
CONTENT	N1.1		Networks								
	N1.1-1	•	identify and use network terminology, including vertices, edges, paths, the degree of a vertex, directed networks and weighted edges		LIT	ACMGM078	explain the meanings of the terms: graph, edge, vertex, loop, degree of a vertex, subgraph, simple graph, complete graph, bipartite graph, directed graph (digraph), arc, weighted graph, and network	NEW			
						ACMGM083	explain the meaning of the terms walk, trail, path, closed walk, closed trail, cycle, connected graph, and bridge				
	N1.1-2	•	solve problems involving network diagrams AAM	**AAM**				NEW			
	N1.1-2a	–	recognise circumstances in which networks could be used, for example the cost of connecting various locations on a university campus with computer cables (ACMGM079)		CCT,ICT,CC			NEW			

			Content Points	AAM	LAC	AC		STATUS	G2012 Course	G2012 Topic	General 2012 Content point
	N1.1-2b	–	given a map, draw a network to represent the map, for example travel times for the stages of a planned journey		CCT,ICT,CC			NEW			
	N1.1-2c	–	draw a network diagram to represent information given in a table					NEW			
CONTENT	N1.2		Shortest paths								
	N1.2-1	•	determine the minimum spanning tree of a given network with weighted edges	**AAM**		ACMGM101	explain the meaning of the terms tree and spanning tree identify practical examples	NEW			
						ACMGM102	identify a minimum spanning tree in a weighted connected graph either by inspection or by using Prim's algorithm				
	N1.2-1a	–	determine the minimum spanning tree by using Kruskal's or Prim's algorithms or by inspection					NEW			
	N1.2-1b	–	determine the definition of a tree and a minimum spanning tree for a given network					NEW			
	N1.2-2	•	find the shortest path from one place to another in a network with no more than 10 vertices	**AAM**	CCT			NEW			
	N1.2-2a	–	identify the shortest path on a network diagram			ACMGM084	investigate and solve practical problems to determine the shortest path between two vertices in a weighted graph (by trial-and-error methods only)	NEW			
	N1.2-2b	–	recognise a circumstance in which a shortest path is not necessarily the best path or contained in any spanning tree		CCT			NEW			