Comparison of AC v8.4 to v9.0

ACiQ v9.0

Year 9: Mathematics

Key	same/refined	removed	new	moved

Note:

- the key applies to the content descriptions only
- v8.4 content descriptions may have been reordered to align with v9.0 content descriptions.

Version 8.4		Version 9.0	
Achievement standard		**Achievement standard**	
By the end of Year 9, students solve problems involving simple interest. They interpret ratio and scale factors in similar figures. Students explain similarity of triangles. They recognise the connections between similarity and the trigonometric ratios. Students compare techniques for collecting data from primary and secondary sources. They make sense of the position of the mean and median in skewed, symmetric and bi-modal displays to describe and interpret data. Students apply the index laws to numbers and express numbers in scientific notation. They expand binomial expressions. They find the distance between two points on the Cartesian plane and the gradient and midpoint of a line segment. They sketch linear and non-linear relations. Students calculate areas of shapes and the volume and surface area of right prisms and cylinders. They use Pythagoras' Theorem and trigonometry to find unknown sides of right-angled triangles. Students calculate relative frequencies to estimate probabilities, list outcomes for two-step experiments and assign probabilities for those outcomes. They construct histograms and back-to-back stem-and-leaf plots.		By the end of Year 9, students recognise and use rational and irrational numbers to solve problems. They extend and apply the exponent laws with positive integers to variables. Students expand binomial products, and factorise monic quadratic expressions. They find the distance between 2 points on the Cartesian plane, and the gradient and midpoint of a line segment. Students use mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear and quadratic functions. They graph quadratic functions and solve monic quadratic equations with integer roots algebraically. Students describe the effects of variation of parameters on functions and relations, using digital tools, and make connections between their graphical and algebraic representations. Students apply formulas to solve problems involving the surface area and volume of right prisms and cylinders. Students solve problems involving ratio, similarity and scale in two-dimensional situations. They determine percentage errors in measurements. Students apply Pythagoras' theorem and use trigonometric ratios to solve problems involving right-angled triangles. They use mathematical modelling to solve practical problems involving direct proportion, ratio and scale, evaluating the model and communicating their methods and findings. Students express small and large numbers in scientific notation. They apply the enlargement transformation to images of shapes and objects, and interpret results. Students design, use and test algorithms based on geometric constructions or theorems. Students compare and analyse the distributions of multiple numerical data sets, choose representations, describe features of these data sets using summary statistics and the shape of distributions, and consider the effect of outliers. Students explain how sampling techniques and representation can be used to support or question conclusions or to promote a point of view. They determine sets of outcomes for compound events and represent these in various ways. Students assign probabilities to the outcomes of compound events. They design and conduct experiments or simulations for combined events using digital tools.	
Strands	**Content descriptions**	**Content descriptions**	**Strands**
Number		recognise that the real number system includes the rational numbers and the irrational numbers, and solve problems involving real numbers using digital tools AC9M9N01	Number
	solve problems involving simple interest ACMNA211		
	express numbers in scientific notation ACMNA210 **Moved to Measurement**		
	solve problems involving direct proportion. Explore the relationship between graphs and equations corresponding to simple rate problems ACMNA208 **Moved to Measurement**		
Algebra	apply index laws to numerical expressions with integer indices ACMNA209	apply the exponent laws to numerical expressions with integer exponents and extend to variables AC9M9A01	Algebra
	extend and apply the index laws to variables, using positive integer indices and the zero index ACMNA212		
	apply the distributive law to the expansion of algebraic expressions, including binomials, and collect like terms where appropriate ACMNA213	simplify algebraic expressions, expand binomial products and factorise monic quadratic expressions AC9M9A02 **Moved from Year 10**	
	find the distance between two points located on the Cartesian plane using a range of strategies, including graphing software ACMNA214	find the gradient of a line segment, the midpoint of the line interval and the distance between 2 distinct points on the Cartesian plane AC9M9A03	
	find the midpoint and gradient of a line segment (interval) on the Cartesian plane using a range of strategies, including graphing software ACMNA294		
	graph simple non-linear relations with and without the use of digital technologies and solve simple related equations ACMNA296	identify and graph quadratic functions, solve quadratic equations graphically and numerically, and solve monic quadratic equations with integer roots algebraically, using graphing software and digital tools as appropriate AC9M9A04 **Moved from Year 10**	
		use mathematical modelling to solve applied problems involving change including financial contexts; formulate problems, choosing to use either linear or quadratic functions; interpret solutions in terms of the situation; evaluate the model and report methods and findings AC9M9A05 **Moved from Year 10**	
		experiment with the effects of the variation of parameters on graphs of related functions, using digital tools, making connections between graphical and algebraic representations, and generalising emerging patterns AC9M9A06	

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	Version 8.4	Version 9.0	
	sketch linear graphs using the coordinates of two points and solve linear equations ACMNA215 **Moved to Year 8**		
Measurement	calculate the surface area and volume of cylinders and solve related problems ACMMG217	solve problems involving the volume and surface area of right prisms and cylinders using appropriate units AC9M9M01	Measurement
	solve problems involving the surface area and volume of right prisms ACMMG218		
	express numbers in scientific notation ACMNA210 **Moved from Number**	solve problems involving very small and very large measurements, time scales and intervals expressed in scientific notation AC9M9M02	
	investigate very small and very large time scales and intervals ACMMG219		
	use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar ACMMG220 **Moved to Geometry and to Year 8**	solve spatial problems, applying angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right-angled triangles AC9M9M03	
	solve problems using ratio and scale factors in similar figures ACMMG221		
	investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles ACMMG222 **Moved to Year 8**		
	apply trigonometry to solve right-angled triangle problems ACMMG224		
	use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles ACMMG223		
		calculate and interpret absolute, relative and percentage errors in measurements, recognising that all measurements are estimates AC9M9M04	
	solve problems involving direct proportion. Explore the relationship between graphs and equations corresponding to simple rate problems ACMNA208 **Moved from Number**	use mathematical modelling to solve practical problems involving direct proportion, rates, ratio and scale, including financial contexts; formulate the problems and interpret solutions in terms of the situation; evaluate the model and report methods and findings AC9M9M05	
	calculate areas of composite shapes ACMMG216 **Moved to Year 8**		
Geometry	use similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles ACMMG223	recognise the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles using properties of similarity AC9M9SP01	Space
	use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar ACMMG220 **Moved from Measurement and to Year 8**	apply the enlargement transformation to shapes and objects using dynamic geometry software as appropriate; identify and explain aspects that remain the same and those that change AC9M9SP02	
		design, test and refine algorithms involving a sequence of steps and decisions based on geometric constructions and theorems; discuss and evaluate refinements AC9M9SP03	
Statistics	investigate reports of surveys in digital media and elsewhere for information on how data were obtained to estimate population means and medians ACMSP227	analyse reports of surveys in digital media and elsewhere for information on how data was obtained to estimate population means and medians AC9M9ST01	Statistics
		analyse how different sampling methods can affect the results of surveys and how choice of representation can be used to support a particular point of view AC9M9ST02	
	construct back-to-back stem-and-leaf plots and histograms and describe data, using terms including 'skewed', 'symmetric' and 'bi modal' ACMSP282	represent the distribution of multiple data sets for numerical variables using comparative representations; compare data distributions with consideration of centre, spread and shape, and the effect of outliers on these measures AC9M9ST03	
	compare data displays using mean, median and range to describe and interpret numerical data sets in terms of location (centre) and spread ACMSP283		
		choose appropriate forms of display or visualisation for a given type of data; justify selections and interpret displays for a given context AC9M9ST04	
	identify everyday questions and issues involving at least one numerical and at least one categorical variable, and collect data directly and from secondary sources ACMSP228	plan and conduct statistical investigations involving the collection and analysis of different kinds of data; report findings and discuss the strength of evidence to support any conclusions AC9M9ST05	
Probability	list all outcomes for two-step chance experiments, both with and without replacement using tree diagrams or arrays. Assign probabilities to outcomes and determine probabilities for events ACMSP225	list all outcomes for compound events both with and without replacement, using lists, tree diagrams, tables or arrays; assign probabilities to outcomes AC9M9P01	Probability
	calculate relative frequencies from given or collected data to estimate probabilities of events involving 'and' or 'or' ACMSP226	calculate relative frequencies from given or collected data to estimate probabilities of events involving "and", inclusive "or" and exclusive "or" AC9M9P02	

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Version 8.4		Version 9.0	
		design and conduct repeated chance experiments and simulations, using digital tools to compare probabilities of simple events to related compound events, and describe results AC9M9P03	

Considerations for planning for the first year of implementation

In the initial year of implementing the Australian Curriculum: Mathematics v9.0, teachers need to consider the implications of content changes as they transition from v8.4.

The table below:

- identifies changes between v8.4 and v9.0 that may influence the sequence of students' learning
- outlines considerations for planning teaching and learning programs for the first year of implementation.

Year 8 content in v8.4	Year 9 content in v9.0	Considerations
solve problems involving profit and loss, with and without digital technologies ACMNA189	use mathematical modelling to solve applied problems involving change including financial contexts; formulate problems, choosing to use either linear or quadratic functions; interpret solutions in terms of the situation; evaluate the model and report methods and findings AC9M9A05 use mathematical modelling to solve practical problems involving direct proportion, rates, ratio and scale, including financial contexts; formulate the problems and interpret solutions in terms of the situation; evaluate the model and report methods and findings AC9M9M05	In v9.0 financial contexts need to be provided for mathematical modelling. Students need to understand the language, processes, concepts and relationships relevant to that context. For example, creating a trade quote requires an understanding of language and concepts such as rate, call out fee, unit price, quantity, amount, per hour, per item and GST.
No content description	solve spatial problems, applying angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right-angled triangles AC9M9M03	The following Year 9 v8.4 content descriptions have been moved to Year 8 v9.0. Investigate Pythagoras' Theorem and its application to solving simple problems involving right angled triangles ACMMG222 Use the enlargement transformation to explain similarity and develop the conditions for triangles to be similar ACMMG220 In the first year of implementation, students will not have engaged in the required prior knowledge of these concepts. Consider including this v8.4 content in teaching and learning sequences.