

## Australian Curriculum Version 9.0: Achievement standard aligned to content descriptions

This resource shows alignment between aspects of the achievement standard and relevant content descriptions for Year 9. A similar resource is available for other year levels.

The Australian Curriculum (AC) v9.0 code for each content description includes an element indicating the strand it is organised by, e.g. AC9M9N01 indicates Number strand.

Key to content description codes: Mathematics	
e.g. AC9M9N01	Strands:
Australian Curriculum (AC)	• N — Number
Version 9 (9)	• A — Algebra
Mathematics (M)	• M — Measurement
Year (9)	• SP — Space
Strand (N, A, M, SP, ST, P)	• ST — Statistics
Content description number (##)	• P — Probability

### Year 9 Australian Curriculum: Mathematics achievement standard

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.

They 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.

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

Achievement standard aspect	Relevant content description/s	AC v9.0 code
<b>By the end of Year 9</b>	<b>Students learn to:</b>	
Students recognise and use rational and irrational numbers to solve problems.	<ul style="list-style-type: none"> <li>recognise that the real number system includes the rational numbers and the irrational numbers, and solve problems involving real numbers using digital tools</li> </ul>	<a href="#">AC9M9N01</a>
They extend and apply the exponent laws with positive integers to variables.	<ul style="list-style-type: none"> <li>apply the exponent laws to numerical expressions with integer exponents and extend to variables</li> </ul>	<a href="#">AC9M9A01</a>
They expand binomial products, and factorise monic quadratic expressions.	<ul style="list-style-type: none"> <li>simplify algebraic expressions, expand binomial products and factorise monic quadratic expressions</li> </ul>	<a href="#">AC9M9A02</a>
They find the distance between 2 points on the Cartesian plane, and the gradient and midpoint of a line segment.	<ul style="list-style-type: none"> <li>find the gradient of a line segment, the midpoint of the line interval and the distance between 2 distinct points on the Cartesian plane</li> </ul>	<a href="#">AC9M9A03</a>
They use mathematical modelling to solve problems involving change in financial and other applied contexts, choosing to use linear and quadratic functions.	<ul style="list-style-type: none"> <li>simplify algebraic expressions, expand binomial products and factorise monic quadratic expressions</li> </ul>	<a href="#">AC9M9A02</a>
	<ul style="list-style-type: none"> <li>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</li> </ul>	<a href="#">AC9M9A04</a>
	<ul style="list-style-type: none"> <li>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</li> </ul>	<a href="#">AC9M9A05</a>
They graph quadratic functions and solve monic quadratic equations with integer roots algebraically.	<ul style="list-style-type: none"> <li>simplify algebraic expressions, expand binomial products and factorise monic quadratic expressions</li> </ul>	<a href="#">AC9M9A02</a>
	<ul style="list-style-type: none"> <li>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</li> </ul>	<a href="#">AC9M9A04</a>
They describe the effects of variation of parameters on functions and relations, using digital tools, and make connections between their graphical and algebraic representation.	<ul style="list-style-type: none"> <li>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</li> </ul>	<a href="#">AC9M9A06</a>
They apply formulas to solve problems involving the surface area and volume of right prisms and cylinders.	<ul style="list-style-type: none"> <li>solve problems involving the volume and surface area of right prisms and cylinders using appropriate units</li> </ul>	<a href="#">AC9M9M01</a>
They solve problems involving ratio, similarity and scale in two-dimensional situations.	<ul style="list-style-type: none"> <li>solve spatial problems, applying angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right-angled triangles</li> </ul>	<a href="#">AC9M9M03</a>
They determine percentage errors in measurements.	<ul style="list-style-type: none"> <li>calculate and interpret absolute, relative and percentage errors in measurements, recognising that all measurements are estimates</li> </ul>	<a href="#">AC9M9M04</a>

Achievement standard aspect	Relevant content description/s	AC v9.0 code
They apply Pythagoras' theorem and use trigonometric ratios to solve problems involving right-angled triangles.	• solve spatial problems, applying angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right-angled triangles	<a href="#">AC9M9M03</a>
	• recognise the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles using properties of similarity	<a href="#">AC9M9SP01</a>
They use mathematical modelling to solve practical problems involving direct proportion, ratio and scale, evaluating the model and communicating their methods and findings.	• solve spatial problems, applying angle properties, scale, similarity, Pythagoras' theorem and trigonometry in right-angled triangles	<a href="#">AC9M9M03</a>
	• 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	<a href="#">AC9M9M05</a>
	• recognise the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles using properties of similarity	<a href="#">AC9M9SP01</a>
	• 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	<a href="#">AC9M9SP02</a>
They express small and large numbers in scientific notation.	• solve problems involving very small and very large measurements, time scales and intervals expressed in scientific notation	<a href="#">AC9M9M02</a>
They apply the enlargement transformation to images of shapes and objects, and interpret results.	• 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	<a href="#">AC9M9SP02</a>
They design, use and test algorithms based on geometric constructions or theorems.	• design, test and refine algorithms involving a sequence of steps and decisions based on geometric constructions and theorems; discuss and evaluate refinements	<a href="#">AC9M9SP03</a>
They compare and analyse the distributions of multiple numerical data sets, choose representations, describe features of these data sets using summary statistics and the shape of distributions, and consider the effect of outliers.	• 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	<a href="#">AC9M9ST03</a>
	• choose appropriate forms of display or visualisation for a given type of data; justify selections and interpret displays for a given context	<a href="#">AC9M9ST04</a>
	• 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	<a href="#">AC9M9ST05</a>
They explain how sampling techniques and representation can be used to support or question conclusions or to promote a point of view.	• analyse reports of surveys in digital media and elsewhere for information on how data was obtained to estimate population means and medians	<a href="#">AC9M9ST01</a>
	• 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	<a href="#">AC9M9ST02</a>
They determine sets of outcomes for compound events and represent these in various ways.	• list all outcomes for compound events both with and without replacement, using lists, tree diagrams, tables or arrays; assign probabilities to outcomes	<a href="#">AC9M9P01</a>
They assign probabilities to the outcomes of compound events.	• list all outcomes for compound events both with and without replacement, using lists, tree diagrams, tables or arrays; assign probabilities to outcomes	<a href="#">AC9M9P01</a>
	• calculate relative frequencies from given or collected data to estimate probabilities of events involving "and", inclusive "or" and exclusive "or"	<a href="#">AC9M9P02</a>
They design and conduct experiments or simulations for combined events using digital tools.	• list all outcomes for compound events both with and without replacement, using lists, tree diagrams, tables or arrays; assign probabilities to outcomes	<a href="#">AC9M9P01</a>
	• calculate relative frequencies from given or collected data to estimate probabilities of events involving "and", inclusive "or" and exclusive "or"	<a href="#">AC9M9P02</a>
	• design and conduct repeated chance experiments and simulations, using digital tools to compare probabilities of simple events to related compound events, and describe results.	<a href="#">AC9M9P03</a>

## More information

If you would like more information, please visit the QCAA website [www.qcaa.qld.edu.au](http://www.qcaa.qld.edu.au). Alternatively, email the K–10 Curriculum and Assessment branch at [australiancurriculum@qcaa.qld.edu.au](mailto:australiancurriculum@qcaa.qld.edu.au).

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