

SECTION **61**

VBQU163

Analyse and evaluate numerical and statistical information

21774VIC Certificate III in General Education for Adults

Unit Code	VBQU163
Unit Title	Analyse and evaluate numerical and statistical information
Unit Descriptor	<p>The focus of this unit is on enabling learners to develop numeracy and mathematical skills involving analysing and evaluating numerical information embedded in a broad range of tasks and texts and analysing and creating statistical data, tables and graphs related to their personal, public, work or education and training lives.</p> <p>The required outcomes described in this unit relate directly to the <i>Australian Core Skills Framework (ACSF)</i>, (© Commonwealth of Australia, 2008). They contribute directly to the achievement of ACSF indicators of competence at Level Five Numeracy: 5.09, 5.10, & 5.11. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p>
Employability Skills	<p>The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The qualification's Employability Skills Summary in which this unit is included will assist in identifying employability skill requirements. The summary is included in Part B Course Requirements of the <i>Certificate in General Education for Adults</i> (See: Appendix B).</p>
Application of the Unit	<p>People seeking to improve their educational, vocational or community participation options will need to develop a range of numeracy and mathematics skills.</p> <p>Numeracy is seen as making meaning of mathematics - mathematics is a tool to be used efficiently and critically, where mathematics is seen as the knowledge and skills to be applied and used for a range of purposes and in a variety of contexts. The goal is therefore to assist learners to develop mathematical concepts and relationships in ways that are personally meaningful.</p> <p>It is strongly recommended that this Unit is integrated with the delivery and assessment of other Numeracy and Mathematics Units. It is also recommended that application is also integrated with other units from across the CGEA. The links between the different units encourage co-delivery and assessment, and replicates real life situations where tasks and activities integrate a wide range of skills including literacy and numeracy.</p>

ELEMENT**PERFORMANCE CRITERIA**

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement.

Assessment of performance is to be consistent with the evidence guide.

1 Analyse and evaluate numerical information in a broad range of texts

1.1 ***Numbers and numerical or quantitative information*** which is ***highly embedded*** within a broad range of ***texts or realistic contexts*** are identified and extracted

1.2 ***Mathematical procedures*** are used to undertake calculations appropriate to analysing the numbers and numerical or quantitative information in the text or context.

1.3 An ***initial estimate*** of the result is made then an accurate ***calculation*** is carried out

1.4 ***Interpretations and conclusions*** are made regarding the use and application of the numerical or quantitative information in the text or context in terms of their accuracy and their personal, social or work implications and consequences.

2 Analyse and evaluate statistical data, tables and graphs

2.1 Statistical ***data*** is collected and represented in appropriate ***tabular and graphical form***

2.2 ***Measures of central tendency and common measures of spread*** are calculated

2.3 ***Interpretations and conclusions*** are made regarding the use and application of the statistical data in terms of its ***accuracy*** and any personal, social or work implications and consequences

2.4 ***Descriptive language*** of graphs, tables and measures of central tendency and spread is used

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

- communication and literacy skills to read relevant texts and diagrams, and undertake learning and assessment
- the ability to interpret, select and investigate appropriate mathematical information and

relationships highly embedded in an activity, item or text

- the ability to select and apply a wide range of mathematical strategies flexibly to generate solutions to problems across a broad range of contexts
- the ability to analyse and evaluate the appropriateness, interpretations and wider implications of all aspects of a mathematical activity
- ability to use a wide range of oral and written informal and formal language and representation including symbols, diagrams and charts to communicate mathematically

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different situations that may affect performance, e.g. access to resources, regional contexts. Bold italicised wording in the Performance Criteria is detailed below.

Numbers and numerical or quantitative information

- numbers can include any form of rational numbers such as fractions, decimals, percentages, rates and ratios and proportions, and their equivalent values
- values and knowledge of probability and chance should be included
- numbers expressed in scientific notation and expressed as indices should be included
- directed numbers should be included

Highly embedded means

- that the mathematical content is highly embedded in complex texts, including websites, and, where necessary, the learner may need to gather additional mathematical information from other sources

Texts or realistic contexts

- printed and non-print texts such as website, newspaper, or magazine journal articles, data on social issues such as gambling, financial information such as debts, health and well-being, road safety and crash statistics, workplace quality control data and information, banking loans, public information put out by councils, utilities, services, etc.

Mathematical procedures could include

- calculation of rates, ratios and proportions but also probabilities of events such as winning tatts/lotto, horse racing odds, throwing of dice, etc.
- the use of appropriate algebraic analysis and formulae
- the ability to accurately calculate with rational numbers
- the use and application of the index laws
- a range of processes flexibly and interchangeably selected

from pen and paper, mental and electronically assisted strategies, including calculators (both CAS and graphing calculators) and software programs where appropriate

Initial estimate

- should be able to make an estimate prior to undertaking any calculations and decide on desired accuracy of the estimate

Calculation includes

- $+$, $-$, \times , \div and operations such as powers, square roots, etc. with rational numbers including fractions, decimals, percentages, rates, ratios and proportions, and their equivalent values
- the use of algebraic analysis
- a range of processes flexibly and interchangeably selected from pen and paper, mental and electronically assisted strategies, including calculators (both CAS and graphing calculators) and software programs where appropriate

Interpretations and conclusions
(of numbers and numerical information is used) includes

- a comparison of final results to initial estimates and reflecting on the context to decide if the result is possible and relevant
- critically reviewing the mathematics used and the outcomes obtained to reflect on and question the outcomes and real-world implications

Data

- a range of data types could be collected and analysed, including whole numbers, percentages, decimals and fractions found in statistical information
- discrete and continuous variable data should be collected
- data should be grouped into appropriate class intervals

Tabular and graphical form

- graphs or charts could include pie charts, frequency graphs such as bar graphs, scatter diagrams, box and whisker plots, line graphs, and cumulative frequency graphs.
- software programs such as spreadsheets, or word processing graphing packages, or graphing calculators should be used to plot graphs

Measures of central tendency and common measures of spread
should include

- three measures of central tendency - mean, median and mode or modal class – including for grouped data
- calculating measures of spread such as the range, interquartile range, common percentiles, and standard deviation

Accuracy

- issues related to accuracy could include distortions of axes and scales including examples such as changing the scale, having gaps in the scale, using pictograms inappropriately to exaggerate scales, etc. and why this may have been used.

Descriptive language:

- language may include maximum, minimum, increasing, decreasing, constant, slope, fluctuating, average, above/below average, distorted, biased, etc.

Interpretations and conclusions
(for statistical data) includes

- a comparison of final outcomes of statistical analysis to initial hypotheses and reflecting on the context to decide if the result is possible and relevant
- critically reviewing the statistical analysis used and the outcomes obtained to reflect on and question the outcomes and real-world implications

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- Learners will be able to analyse and evaluate numerical information in texts
- Learners will be able to analyse and evaluate statistical data, tables and graphs.

Where performance criteria include a list of concepts or knowledge (e.g., such as the range of graphs or charts including pie charts, frequency graphs such as bar graphs, scatter diagrams, box and whisker plots, line graphs, and cumulative frequency graphs) it is assumed that most of these will be included as part of the teaching/learning program. It is not envisaged that all the listed items be assessed individually - competence across a representative sample being sufficient evidence that the criterion can be met.

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit.

Context of and specific resources

- assessment of performance requirements in this unit is

for assessment

undertaken over the course of the program

- access to real/authentic or simulated tasks, materials and texts in relevant contexts
- access to a computer and internet for information
- access to calculators, computers for word processing or spreadsheets as appropriate

Guidance information for assessment

A range of assessment strategies or options should be considered to suit the needs of the learner. The needs of the learner will be met by provision of:

- use of relevant contexts and materials where the maths content may be hidden
- a learning environment appropriate to the assessment task
- appropriate support allowing for full participation
- computer hardware and software, if appropriate

At this level the learner can:

- use a range of processes flexibly and interchangeably selecting from pen and paper, mental and electronically assisted strategies, including calculators (both CAS and graphing calculators) and software programs where appropriate to solve problems
- use a wide range of formal and informal oral and written mathematical language, symbols, abbreviations and diagrams in providing answers and solutions
- work autonomously and access and evaluate support from a broad range of sources including asking for clarification and discussion of strategies from the teacher/tutor if required and recourse to first/other language is acceptable

Appropriate assessment strategies include:

- records of teacher observations of students' activities, discussions and practical tasks
- questioning, for example:
 - online responses
 - interviews
 - self-assessment

- verbal questioning
- written questioning
- portfolios, for example:
 - samples compiled by the learner
 - written reports of investigations or problem-solving activities
 - product with supporting documentation
 - self-assessment sheets, reflections, journal entries
 - pictures, diagrams, models etc. created by the learner
 - records of teacher observations of learner's activities, discussions and practical tasks
- third party feedback such as testimonials/reports from other teachers or support workers

SECTION **62**

VBQU164

Use algebraic techniques to analyse mathematical problems

21774VIC Certificate III in General Education for Adults

Unit Code	VBQU164
Unit Title	Use algebraic techniques to analyse mathematical problems
Unit Descriptor	<p>The focus of this unit is on enabling learners to develop numeracy and mathematical skills involving using a range of algebraic techniques to investigate and solve mathematical problems and on developing and using formulae and their graphs to describe and represent relationships between variables related to their personal, public, work or education and training lives.</p> <p>The required outcomes described in this unit relate directly to the <i>Australian Core Skills Framework (ACSF)</i>, (© Commonwealth of Australia, 2008). They contribute directly to the achievement of ACSF indicators of competence at Level Five Numeracy: 5.09, 5.10, & 5.11. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p>
Employability Skills	<p>The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The qualification's Employability Skills Summary in which this unit is included will assist in identifying employability skill requirements. The summary is included in Part B Course Requirements of the <i>Certificate in General Education for Adults</i> (See: Appendix B).</p>
Application of the Unit	<p>People seeking to improve their educational, vocational or community participation options will need to develop a range of numeracy and mathematics skills.</p> <p>Numeracy is seen as making meaning of mathematics - mathematics is a tool to be used efficiently and critically, where mathematics is seen as the knowledge and skills to be applied and used for a range of purposes and in a variety of contexts. The goal is therefore to assist learners to develop mathematical concepts and relationships in ways that are personally meaningful.</p> <p>It is strongly recommended that this Unit is integrated with the delivery and assessment of other Numeracy and Mathematics Units. It is also recommended that application is also integrated with other units from across the CGEA. The links between the different units encourage co-delivery and assessment, and replicates real life situations where tasks and activities integrate a wide range of skills including literacy and numeracy.</p>

ELEMENT

Elements describe the essential outcomes of a unit of competency.

PERFORMANCE CRITERIA

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement.

Assessment of performance is to be consistent with the evidence guide.

- | | | |
|---|--|--|
| 1 | Use a range of algebraic techniques to analyse and solve problems | <p>1.1 <i>Algebraic expressions, equations and formulae</i> and their <i>conventions</i> are used to describe <i>generalisations, number patterns or relationships</i> between variables</p> <p>1.2 The <i>conventions, symbolic notation and representation</i> of algebra including <i>signed numbers</i> and <i>indices</i> are used appropriately</p> <p>1.3 Substitution into <i>algebraic expressions, equations and formulae</i> is used appropriately to find particular values</p> <p>1.4 Solve a <i>range of equations</i> using a variety of <i>algebraic techniques</i></p> |
| 2 | Develop and use a range of algebraic graphs to analyse relationships between variables | <p>2.1 <i>Graphical techniques</i> are used to draw linear and <i>simple non-linear</i> graphs and analyse and solve relationships and <i>equations</i></p> <p>2.2 <i>General shapes and major characteristics</i> of linear and <i>simple non-linear graphs</i> are identified and their real world meanings interpreted</p> <p>2.3 Equations are developed and written from given linear and <i>simple non-linear graphs</i></p> |

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

- communication and literacy skills to read relevant texts and diagrams, and undertake learning and assessment
- the ability to interpret, select and investigate appropriate mathematical information and relationships highly embedded in an activity, item or text
- the ability to select and apply a wide range of mathematical strategies flexibly to generate solutions to problems across a broad range of contexts
- the ability to analyse and evaluate the appropriateness, interpretations and wider implications of all aspects of a mathematical activity
- ability to use a wide range of oral and written informal and formal language and representation including symbols, diagrams and charts to communicate mathematically

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different situations that may affect performance, e.g. access to resources, regional contexts. Bold italicised wording in the Performance Criteria is detailed below.

- Algebraic expressions, equations and formulae*** include
- algebraic expressions and equations with two unknowns/variables
 - linear and simple non-linear expressions and equations such as quadratic expressions
 - formulae such as measurement formulae for more complex shapes such as spheres, pyramids; for work related formulae such as Ohms Law; Body Mass Index; etc.
- Generalisations, number patterns or relationships*** include
- linear and simple non-linear number patterns
 - direct or inverse variation between variables in real or simulated situations
 - exponential growth or decay
- Conventions and symbolic notation and representation*** may include
- simple indices, square roots, brackets, alternative conventions for division, and signed numbers to express and interpret formulae, rules and equations
- Signed numbers***
- when used in formulae, rules and equations
- Indices***
- Indices should include positive, negative and key fractional values such as $\frac{1}{2}$ and use and application of the index laws
- Range of equations***
- should include a variety of types such as linear, quadratic, and simultaneous equations, which emerge from problem solving situations
- Algebraic techniques***
- should be able to solve a range of equations using a variety of techniques such as: same operation on both sides; backtracking; factorising; or guess, check and improve and include transpositions, and some manipulation of algebraic fractions
 - can include the use of electronically assisted strategies, including CAS calculators and software programs
- Graphical techniques*** should include
- plotting points; sketching from known main features of algebraic function; and using technology like a graphing calculator or computer package (where experimental data is plotted, lines of best fit to be drawn by eye only or using graphing calculators or software programs)
 - electronically assisted strategies, including CAS and

graphing calculators and appropriate software programs

Equations to be solved by graphical techniques

- may include simultaneous equations (e.g., two linear or one linear and one quadratic) but preferably linked to realistic contexts or situations such as comparing two different charge out rates for a service person

General shapes and major characteristics include

- naming and recognition of linear, parabolic and hyperbolic shapes
- characteristics include, x and y-intercepts, gradients, lines of symmetry, turning points, etc.

Simple non-linear graphs

- should include parabolas and hyperbolas

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- Learners will be able to use algebraic techniques to analyse and solve problems.
- Learners will be able to develop and use algebraic graphs to analyse relationships between variables

Where performance criteria include a list of concepts or knowledge (e.g., such as the range of algebraic techniques: same operation on both sides; backtracking; factorising; or guess, check and improve and include transpositions, and some manipulation of algebraic fractions) it is assumed that most of these will be included as part of the teaching/learning program. It is not envisaged that all the listed items be assessed individually - competence across a representative sample being sufficient evidence that the criterion can be met.

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit.

Context of and specific resources for assessment

- assessment of performance requirements in this unit is undertaken over the course of the program
- access to real/authentic or simulated tasks, materials and texts in relevant contexts
- access to a computer and internet for information
- access to calculators, computers for word processing or

Guidance information for assessment

spreadsheets as appropriate

A range of assessment strategies or options should be considered to suit the needs of the learner. The needs of the learner will be met by provision of:

- use of relevant contexts and materials where the maths content may be hidden
- a learning environment appropriate to the assessment task
- appropriate support allowing for full participation
- computer hardware and software, if appropriate

At this level the learner can:

- use a range of processes flexibly and interchangeably selecting from pen and paper, mental and electronically assisted strategies, including calculators (both CAS and graphing calculators) and software programs where appropriate to solve problems.
- use a wide range of formal and informal oral and written mathematical language, symbols, abbreviations and diagrams in providing answers and solutions.
- work autonomously and access and evaluate support from a broad range of sources including asking for clarification and discussion of strategies from the teacher/tutor if required and recourse to first/other language is acceptable

Appropriate assessment strategies include:

- records of teacher observations of students' activities, discussions and practical tasks
- questioning, for example:
 - online responses
 - interviews
 - self-assessment
 - verbal questioning
 - written questioning
- portfolios, for example:
 - samples compiled by the learner
 - written reports of investigations or problem-solving activities
 - product with supporting documentation

- self-assessment sheets, reflections, journal entries
- pictures, diagrams, models etc. created by the learner
- records of teacher observations of learner's activities, discussions and practical tasks
- third party feedback such as testimonials/reports from other teachers or support workers

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SECTION **63**

VBQU165

Use formal mathematical concepts and techniques to analyse and solve problems

Unit Code	VBQU165
Unit Title	Use formal mathematical concepts and techniques to analyse and solve problems
Unit Descriptor	<p>The focus of this unit is on enabling learners to develop numeracy and mathematical skills involving identifying and using a range of formal mathematical concepts and techniques and mathematical problem-solving techniques to analyse and solve mathematical problems related to their personal, public, work or education and training lives.</p> <p>The required outcomes described in this unit relate directly to the <i>Australian Core Skills Framework (ACSF)</i>, (© Commonwealth of Australia, 2008). They contribute directly to the achievement of ACSF indicators of competence at Level Five Numeracy: 5.09, 5.10, & 5.11. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p>
Employability Skills	<p>The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The qualification's Employability Skills Summary in which this unit is included will assist in identifying employability skill requirements. The summary is included in Part B Course Requirements of the <i>Certificate in General Education for Adults</i> (See: Appendix B).</p>
Application of the Unit	<p>People seeking to improve their educational, vocational or community participation options will need to develop a range of numeracy and mathematics skills.</p> <p>Numeracy is seen as making meaning of mathematics - mathematics is a tool to be used efficiently and critically, where mathematics is seen as the knowledge and skills to be applied and used for a range of purposes and in a variety of contexts. The goal is therefore to assist learners to develop mathematical concepts and relationships in ways that are personally meaningful.</p> <p>It is strongly recommended that this Unit is integrated with the delivery and assessment of other Numeracy and Mathematics Units. It is also recommended that application is also integrated with other units from across the CGEA. The links between the different units encourage co-delivery and assessment, and replicates real life situations where tasks and activities integrate a wide range of skills including literacy and numeracy.</p>

ELEMENT**PERFORMANCE CRITERIA**

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range statement.

Assessment of performance is to be consistent with the evidence guide.

1	Identify and use formal mathematical concepts and techniques to analyse and solve problems	1.1	<i>A range of mathematical concepts and techniques</i> relevant to the learner's future study or employment needs is identified
		1.2	Appropriate <i>mathematical concepts and techniques</i> are used to solve mathematical problems
		1.3	<i>Specialised calculator or software functions</i> relevant to the mathematical areas are used
		1.4	<i>Specialised mathematical and general language and representation</i> related to the mathematical areas are used appropriately
2	Use mathematical problem-solving techniques to analyse and solve problems	2.1	Appropriate <i>problem-solving techniques</i> are used to interpret and extract relevant information from a task or problem.
		2.2	<i>Specialised mathematical and general language and representation</i> related to the problem solving and mathematical techniques are used to explain the procedures used to solve the problem and to communicate the outcomes of the problem

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

- communication and literacy skills to read relevant texts and diagrams, and undertake learning and assessment
- the ability to interpret, select and investigate appropriate mathematical information and relationships highly embedded in an activity, item or text
- the ability to select and apply a wide range of mathematical strategies flexibly to generate solutions to problems across a broad range of contexts
- the ability to analyse and evaluate the appropriateness, interpretations and wider implications of all aspects of a mathematical activity
- ability to use a wide range of oral and written informal and formal language and representation including symbols, diagrams and charts to communicate mathematically

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different situations that may affect performance, e.g. access to resources, regional contexts. Bold italicised wording in the Performance Criteria is detailed below.

A range of mathematical concepts and techniques means

- the core knowledge and skills of at least two different specialist mathematical areas relevant to the learner's future employment or study needs are chosen for further study, for example:
 - trigonometry including areas such as trigonometric ratios, bearings, angles of elevation and depression, etc.
 - probability including areas such as the use of tree and Venn diagrams, complementary events, mutually exclusive events, etc.
 - further statistics such as hypothesis testing and linear regression
 - introduction to calculus
 - scalars and vectors
 - matrices
 - business mathematics.
- mathematical concepts and techniques developed through this Element should be initially developed out of and related to practical problems. However it is expected that the related abstract mathematical concepts and techniques will need to be taught formally so that the learning forms the basis for future formal study in the area

Specialised calculator or software functions

- may include trigonometric, statistical, algebraic, power, graphical functions, etc
- electronically assisted strategies, including calculators (statistical, CAS and graphing calculators) and software programs should be utilised where appropriate to the area of study chosen

Specialised mathematical and general language and representation includes

- a combination of formal, written and oral specialised language and representation from the content areas selected are used appropriately to document, interpret and communicate the mathematical thinking, problem solving processes, outcomes and implications of the mathematical investigation

Problem-solving techniques

- appropriate problem solving techniques could be selected from strategies such as: guess and check; elimination; making a table, diagram or sketch; using patterns, rules,

relationships and algebra; simplifying; or using a model or graph; etc.

- combinations and permutations is a possible area that could be investigated and used for this Element.

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment section in Section B of the accreditation submission.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- Learners will be able to identify and use formal mathematical concepts and techniques to analyse and solve problems
- Learners will be able to use mathematical problem-solving techniques to analyse and solve problems.

Where performance criteria include a list of concepts or knowledge (e.g., the range of problem solving techniques: guess and check; elimination; making a table, diagram or sketch; using patterns, rules, relationships and algebra; simplifying; or using a model or graph; etc.) it is assumed that most of these will be included as part of the teaching/learning program. It is not envisaged that all the listed items be assessed individually - competence across a representative sample being sufficient evidence that the criterion can be met.

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit.

Context of and specific resources for assessment

- assessment of performance requirements in this unit is undertaken over the course of the program
- access to real/authentic or simulated tasks, materials and texts in relevant contexts
- access to a computer and internet for information
- access to calculators, computers for word processing or spreadsheets as appropriate

Guidance information for assessment

A range of assessment strategies or options should be considered to suit the needs of the learner. The needs of the learner will be met by provision of:

- use of relevant contexts and materials where the maths content may be hidden

- a learning environment appropriate to the assessment task
- appropriate support allowing for full participation
- computer hardware and software, if appropriate

At this level the learner can:

- use a range of processes flexibly and interchangeably selecting from pen and paper, mental and electronically assisted strategies, including calculators (both CAS and graphing calculators) and software programs where appropriate to solve problems.
- use a wide range of formal and informal oral and written mathematical language, symbols, abbreviations and diagrams in providing answers and solutions.
- work autonomously and access and evaluate support from a broad range of sources including asking for clarification and discussion of strategies from the teacher/tutor if required and recourse to first/other language is acceptable

Appropriate assessment strategies include:

- records of teacher observations of students' activities, discussions and practical tasks
- questioning, for example:
 - online responses
 - interviews
 - self-assessment
 - verbal questioning
 - written questioning
- portfolios, for example:
 - samples compiled by the learner
 - written reports of investigations or problem-solving activities
 - product with supporting documentation
 - self-assessment sheets, reflections, journal entries
 - pictures, diagrams, models etc. created by the learner
 - records of teacher observations of learner's activities, discussions and practical tasks
- third party feedback such as testimonials/reports from other teachers or support workers