APPLY ENGINEERING MATHEMATICS

UNIT CODE: ENG/OS/AME/CC/02/4/A

UNIT DESCRIPTION

This unit describes the competencies required by a worker employed in the agricultural machinery sector in order to apply a wide range of engineering mathematics in their work. It includes using concepts of basic arithmetic in solving work problems. It also involves using formulae and algebraic expressions for solving work problems and applying geometrical calculations for solving work problems. It also involves applying statistics to solve work problems

ELEMENTS AND PERFORMANCE CRITERIA

Element These describe the **key outcomes** which make up workplace function (to be stated in active voice).	**Performance criteria** These are **assessable statements** which specify the required level of performance for each of the elements (to be stated in passive voice). **Note: *bold and italicized terms are elaborated in the range***
1. Use concepts of basic arithmetic in solving work problems	1.1 Identify various kinds of ***numbers*** 1.2 Carry out arithmetical operations accurately 1.3 Use indices in multiplication and division
2. Use formulae and algebraic expressions for solving work problems	2.1 Solve simple algebraic equations 2.2 Form simple algebraic equations 2.3 Represent linear equations 2.7 Solve simple ***simultaneous equations***
3. Apply geometrical calculations for solving work problems	3.1 Calculate areas of ***selected shapes*** 3.2 Calculate surface areas of selected shapes 3.3 Calculate volumes of selected shapes 3.4 Apply Pythagoras theorem
4. Apply statistics to solve work problems	4.1 Collection of Data 4.2 Organization of Data 4.3 Representation of Data 4.4 Calculate Median 4.5 Draw ***Charts*** 4.6 Interpretation of data
5. Carry out business calculations	5.1 Calculation of Profit and loss 5.2 Calculation of Discount and commission 5.3 Determine Rates and taxes

	5.4 Compute Simple and compound interest

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Numbers include but not limited to:	• Counting • Positive • Negative integers • Rational and irrational • Real numbers • Absolute values of numbers
2. Simultaneous equations include but not limited to:	• Substitution • Elimination
3. Selected shapes include but not limited to:	• Parallelogram • Trapezium • Circle • Sector • Annulus
4. Charts include but not limited to:	• Pie chart • Bar chart • Pictograms

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate ability related to:

- Communication
- Team work
- Problem solving
- Planning and organizing
- Self-management
- Measurement
- Use of mathematical tools and equipment

Required Knowledge

1. The individual needs to demonstrate knowledge of:

2. Types of mathematical tools, and equipment
3. National legislation and regulations
4. Safe working practices and procedures to be followed when doing mathematics
5. Safety and environmental hazards associated with mathematical tools, and equipment
6. Using mathematical tools, and equipment
7. Basic maintenance and servicing of mathematical tools, and equipment

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and rang

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: • Uses concepts of basic arithmetic in solving work problems • Uses formulae and algebraic expressions for solving work problems • Applies geometrical calculations for solving work problems • Applies statistics to solve work problems • Carries out business calculations
2. Resource Implications	The following resources must be provided: • Mathematical tools and equipment • A functional well-equipped classroom
3. Methods of Assessment	Competency in this unit may be assessed through: • Observation (performance checklist) • Oral • Written • Third party report • Practicals
4. Context of Assessment	Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.