THE REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARDS

FOR

CARPENTRY AND JOINERY ARTISAN

KNQF LEVEL 4

ISCED CODE: 0722 354B

TVET CDACC
P.O BOX 15745-00100
NAIROBI

APPLY BASIC MATHEMATICS

UNIT CODE:CON/OS/CAJ/CC/01/4/B

UNIT DESCRIPTION:

This unit describes the competencies required in applying basic mathematics in carpentry and joinery. It involves applying algebra, applying trigonometry, performing geometrical calculations, carrying out mensuration, applying statistics and applying linear graphs.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements.(***Bold and italicized terms are elaborated in the Range)***
1. Apply Algebra	1.1 Performed calculations involving Indices as per the concept 1.2 Represented linear equations based on the concept 1.3 Scientific calculator is used in solving mathematical problems in line with manufacturer's manual 1.4 Simultaneous equations are performed as per the rules 1.5 Solved simple algebraic equations as per the concept 1.6 Form simple algebraic equations as per the concept
2. Apply Trigonometry	2.1 Calculations are performed using trigonometric rules 2.2 Applied trigonometric rules as per the concept
3. Perform geometrical calculations	3.1 Calculated areas of figures as per the given formulae 3.2 Apply Pythagoras' theorem based on the concept
4. Carry out Mensuration	4.1 Identified various **units of measurements** as per the course requirements 4.2 Converted units from one form to another 4.3 Perimeter and areas of ***figures*** are obtained as per the correct formulae 4.4 Volume and of Surface area of solids are obtained

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements.(**Bold and italicized terms are elaborated in the Range)**
	4.5 Area of irregular figures are obtained
5. Apply Statistics	5.1 Identified grouped and ungrouped data 5.2 Organized ungrouped data as per the concept 5.3 Represented data in frequency tables 5.4 Calculated the median of grouped and ungrouped data 5.5 Represented data in a chart form 5.6 Interpreted data from a given chart
6. Apply linear graphs	6.1 Plot a **linear graph** for given set of data 6.2 Read and used information from a given linear graph

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. Units of measurement may include but not limited to:	• Millimetres • Centimetres • Metres • Kilometres
2. Figures may include but not limited to:	• square • rectangle • triangle • polygons • circles
3. Linear graphs may include but not limited to:	• Distance against time • Temperature against time • Velocity against distance

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Applying fundamental operations (addition, subtraction, division, multiplication)
- Using and applying mathematical formulas
- Logical thinking
- Problem solving
- Applying statistics
- Drawing graphs
- Using different measuring tool

Required knowledge

The individual needs to demonstrate knowledge of:

- Fundamental operations (addition, subtraction, division, multiplication)
- Calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Rounding techniques
- Types of fractions
- Types of tables and graphs
- Presentation of data in tables and graphs

EVIDENCE GUIDE

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

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Demonstrated ability to apply Trigonometry as per the concept 1.2 Was able to carry out mensuration 1.3 Performed Simultaneous equations as per the rules 1.4 Solved simple algebraic equations as per the concept 1.5 Demonstrated knowledge of Applied statistics 1.6 Applied linear graphs correctly
2. Resource Implications	The following resources should be provided:

	2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Measuring equipment 2.3 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Direct Observation 3.2 Demonstration with Oral Questioning 3.3 Written tests
4. Context of Assessment	Competency may be assessed 4.1 On-the-job 4.2 Off-the –job 4.3 During Industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.