



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

GENERAL EDUCATION AND TRAINING CERTIFICATE

NQF LEVEL 1

AET LEVEL 4 SITE-BASED ASSESSMENT

**LEARNING AREA : MATHEMATICS AND
MATHEMATICAL SCIENCES**

CODE : MMSC4

TASK : PROJECT

DURATION : 3 WEEKS

MARKS : 50

This assessment task consists of 8 pages and 1 annexure.

INSTRUCTIONS AND INFORMATION

1. Read questions carefully, and do thorough planning before you start with the project.
2. Indicate units of measurement where applicable.
3. Follow the additional INSTRUCTIONS given for each activity.
4. You may use an approved calculator. Round off ALL the final answers to TWO decimal places unless stated otherwise.
5. You will need the following resources for this project:
 - Pencil
 - Calculator
 - Ruler

ACTIVITY 1

- 1.1 Look at this plan of a house:



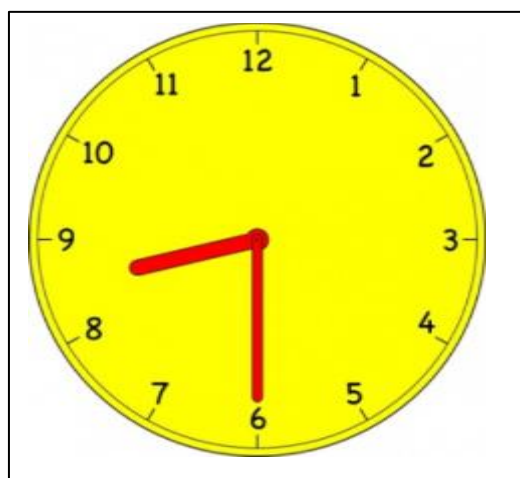
- 1.1.1 Measure carefully with a ruler on the house plan and complete the following table. [Scale: 1 *cm* on the plan represent 100 *cm* of the actual distance on the ground]

	Distance on plan 1 cm (10 mm)	Actual distance 100 cm (1 m)
Kitchen Tile floor: Length		
Kitchen Tile floor: Breadth		
Bedroom 2: Length		
Bedroom 2: Breadth		
Width of the inside doors		
Length of the kitchen window		

(6)

- 1.1.2 Name the shape of bedroom 2. (1)
- 1.1.3 Why do you think the door is represented with a curve? (1)
- 1.1.4 What is the perimeter of the bedroom 2? (2)
- 1.1.5 Calculate the combined area of the Kitchen and Living Room tile floors (2)
- 1.1.6 Calculate the cost of the tiles in the Kitchen and Living Room if the tiles cost R105 per square metre? (2)
- 1.1.7 How many floor tiles of 50 *cm* by 50 *cm* each would be needed to cover the kitchen and living room tile floor areas (do not take any fittings into account)? (2)

- 1.2 The picture of a circle with a diameter of 12 *cm*. Determine the area of the analogue time clock. Answer correct to 2 decimal place and $\pi = 3,14$.



Analogue time is measured using two 12 hours sections (a.m. and p.m.) (2)

- 1.3 What is the analogue time on this shown clock?



(1)

- 1.4 Give the analogue or the digital time for each of the following:

- (a) 21:10
(b) 9 *p.m.*
(c) Ten to five in the afternoon.

(3 x 1)

(3)

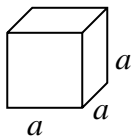
[22]

ACTIVITY 2

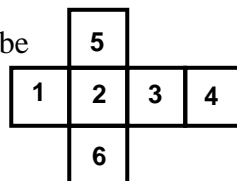
Surface Area Formulas

The surface area of a shape is the sum of the area of all the shapes that cover the surface of the object.

Surface Area of a Cube = $6a^2$ where a is the length of each side of the cube



The net of the cube



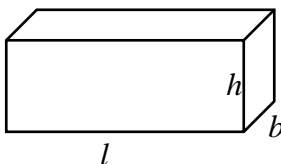
The surface area of a cube is the sum of the areas of the six sides of the cube.

Each side of the cube is a square. A cube has 6 equal squares

Area of one square: $a \times a = a^2$

Therefore: Area of cube = $6a^2$

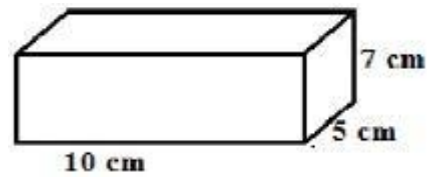
Surface Area of a Rectangular Prism = $2lb + 2bh + 2lh$ where l = length; b = breadth and h = height



The surface area = $2lb + 2bh + 2lh$

Example: Find the surface area of this rectangular prism.

$$\begin{aligned}
 \text{The surface area} &= 2lb + 2bh + 2lh \\
 &= 2(10 \times 5) + 2(5 \times 7) + 2(10 \times 7) \\
 &= 2(50) + 2(35) + 2(70) \\
 &= 100 + 70 + 140 \\
 &= 310 \text{ cm}^2
 \end{aligned}$$



Area is always given as a square measure (mm^2 or cm^2 or m^2 etc.)

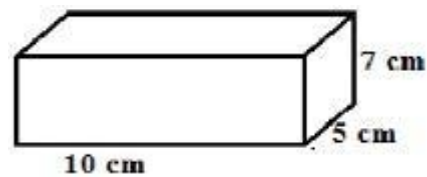
Volume = $l \times b \times h$ where l = length; b = breadth and h = height

The volume of any regular prism is always: Area of base x height

Example: Find the volume of this rectangular prism.

Multiply the length (l) by the breadth (b) by the height (h).

$$\begin{aligned}
 \text{Volume} &= 10 \text{ cm} \times 5 \text{ cm} \times 7 \text{ cm} \\
 &= 350 \text{ cm}^3
 \end{aligned}$$



Volume is always given as a cubic measure (mm^3 or cm^3 or m^3 etc.)

- 2.1 The owner of a computer storage building wants to install air-conditioning. The size of the air conditioner depends on the capacity of the building. Below is a diagram with the dimensions of the building. The diagram is not drawn to scale.

NOTE: The building consists out of a rectangular prism and a triangular prism.



- 2.1.1 Name TWO polyhedrons that make out the building. (2 x 1) (2)
- 2.1.2 Calculate the volume of the whole building including the roof. (4)
- 2.1.3 Calculate the length of side named edge on the picture. (3)
- 2.1.4 Calculate the total surface of the outside of the building including the roof. (4)

2.2 As shown in the diagrams below a rectangular block (FIGURE A) has been sliced produce a polyhedron (FIGURE B) with rectangular face. Study FIGURE A on the left and Figure B on the right in order to answer and do the activities that follow.

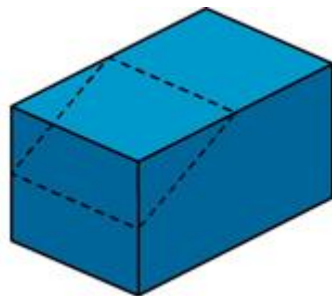


FIGURE A

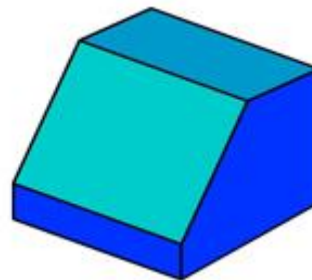


FIGURE B

Slice along the dotted lines to form this polyhedron (right)

- 2.2.1 Draw a net for the rectangular block (FIGURE A) before it was sliced. (3)
- 2.2.2 How many faces, vertices and edges does the sliced polyhedron (FIGURE B) have? (3)
- 2.2.3 a) In ANNEXURE A you are given a rectangular block in FIGURE C. Make dotted lines to mark off how you would slice the rectangular blocking FIGURE C so that a face of the sliced rectangular block is a pentagon.
- b) After slicing of the marked piece, draw alongside figure C, the new polyhedron with the pentagonal face. Label this new sliced polyhedron FIGURE D. (2 x 1) (2)

2.2.4 Copy and complete the following table with respect to FIGURES A, B and D.

FIGURES	TYPES	FACES (F)	VERTICES(V)	EDGES(E)
A	Rectangular block			
B	Sliced polyhedron with a rectangular face			
D	Sliced polyhedron with pentagonal face			

There is a special relationship among the number of vertices (V), faces (F) and edges (E). Look for patterns in your completed table and then write relationship you discovered.

(7)
[28]

TOTAL: 50

ANNEXURE A

NAME: _____

