

UNIVERSITY OF FORT HARE

ALICE CAMPUS

EDM 322

BACHELOR OF EDUCATION: YEAR 3

**FINAL OCTOBER/NOVEMBER
EXAMINATIONS**

2016

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Subject: MATHEMATICS METHOD

Time: 3 Hours

Marks: 100

This paper consists of 7 pages including the cover page

Examiner: Dr WW Hendricks

Internal Moderator: Mr C Thomas

Instructions:

1. Answer all 4 questions
2. Use the mark allocation as a guide when responding to questions
3. Where possible, use tables, graphs or diagrams to enhance your answers
4. Write your name and student number on your answer sheet.

DO NOT TURN THE PAGE BEFORE BEING TOLD TO DO SO

Question 1

- 1.1 One of the content areas included in the Senior Phase mathematics is 'Space and Shape' (Geometry)
- 1.1.1 Explain to a Grade 7 class the main concepts/ topics covered under Space and Shape in the Senior Phase. (4)
- 1.1.2 Give four reasons why Space and Shape (Geometry) should be included in the mathematics curriculum. (4)
- 1.2 Classification of 2D shapes and 3D solids is part of mathematics in the Senior Phase.
- 1.2.1 Explain the differences between 2- dimensional and 3-dimensional objects as if you are explaining them to Grade7 learners. (3)
- 1.2.2 Write the names of the 5 polygons and explain each type. (5)
- 1.2.3 Write down the formula for the sum of the interior angles of a regular polygon with n number of sides. (2)
- 1.2.4 Hence write down the formula for each angle of the polygon with n number of sides. (2)
- 1.3 You want your Grade 8 learners to investigate the relation connecting the number of vertices, edges and faces of the Platonic solids.
- 1.3.1 Explain to your learners the following concepts:
- a) edges (1)
- b) vertices (1)
- 1.3.2 Write the rule relating to the number of vertices, edges and faces of a Platonic solid (2)
- 1.3.3 A solid has 8 vertices and 6 faces. Name the solid. (1)

[25]

Question2:

- 2.1 CAPS for the Senior Phase in Mathematics for Grade 7 suggest that learners should be able to:

Describe, sort, name and compare triangles according to their sides and angles

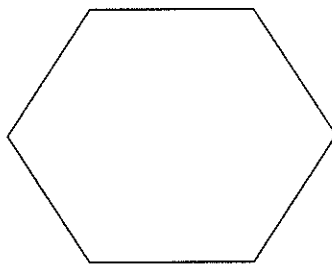
- 2.1.1 Name the triangles according to the length of the sides (3)
- 2.1.2 Explain the properties of triangles according to the length of sides. (6)
- 2.1.3 Can a triangle be right angled and isosceles? Give a reason for your response. (3)

2.2 Match each definition with the correct figure. If a definition applies to more than one figure, then choose the figure that it describes the best. You may only use each definition once. (Write the number of the figure and the letter of the definition – you do not have to rewrite the whole definition.)

FIGURE		DEFINITION
1. square	A	a quadrilateral with diagonals that bisect at 90°
2. rhombus	B	a quadrilateral with one pair parallel sides
3. kite	C	a quadrilateral with 90° angles and four equal sides
4. trapezium	D	a quadrilateral with equal adjacent sides

(8)

2.3 You are given below the sketch of a **regular polygon**. Sketch the polygon in your answer book. From a point inside the polygon, draw lines to the vertices of the polygon to divide it into triangles.

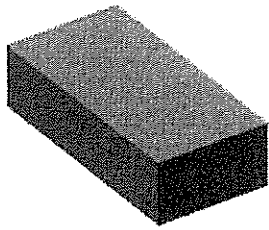


- 2.3.1 How many triangles are formed inside the polygon? (1)
- 2.3.2 Using the number of triangles formed; show that the size of one interior angle of the polygon is 120° . (4)

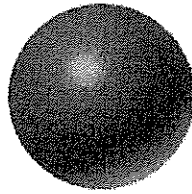
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Question 3:

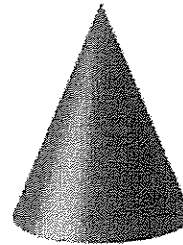
3.1 Pictures of six platonic solids are given below. Copy the table on the next page in your answer book and write down the formulas for the volume and surface area of these figures.



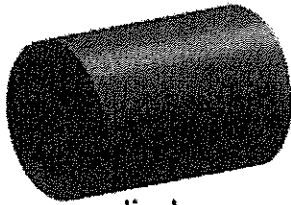
rectangular prism



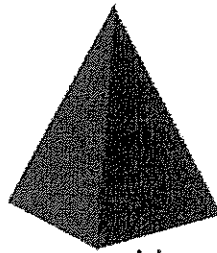
sphere



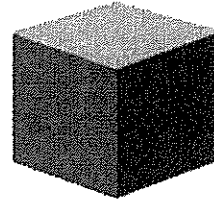
cone



cylinder



pyramid



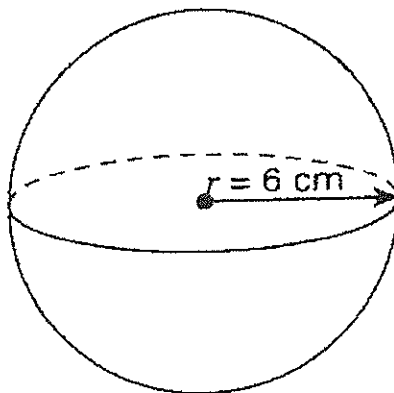
cube

Name of Solid	Volume	Surface Area
a) Rectangular prism		
b) Cube		
c) Cylinder		
d) Sphere		
e) Cone		
f) Pyramid		

(12)

3.2 Study the shape of the sphere in the diagram below and answer the questions that are as follow:

Sphere



- 3.2.1 Use the formula for the sphere and calculate the total surface area if the radius = 6 cm.
(Round off your answer to 2 decimal places) (3)
- 3.2.2 Calculate the volume of the sphere if the radius = 6cm.
(Round off your answer to 2 decimal places) (3)
- 3.3 The same sphere is divided into two equal parts.
- 3.3.1 What are the new shapes now called? (1)
- 3.3.2 Calculate the surface area of one of the new shapes. (3)
- 3.3.3 Calculate the volume of one of the new shapes. (3)

[25]

Question 4:

- 4.1 One of the new topics that were introduced in the CAPS curriculum for the Senior Phase is Probability.
- 4.1.1 What does the acronym 'CAPS' stand for? (1)
- 4.1.2 Define 'Probability' in mathematics. (1)
- 4.2 One of the graphical representations (diagrams) in Probability is the Venn diagram. Name ONE other diagram. (1)
- 4.3.1 To plan the number of meals to be organized in a restaurant, a survey was conducted and the following data were obtained:
- 130 people ate breakfast
 - 275 people ate lunch
 - 180 people ate dinner
 - 112 people ate breakfast and lunch
 - 68 people ate breakfast and dinner
 - 90 people ate lunch and dinner
 - 58 people ate all three meals

Use a Venn diagram to determine the probability when a person is selected at random that they:

4.3.1 ate *at least* one meal in the restaurant. (2)

4.3.2 ate *only* dinner in the restaurant. (2)

4.3.3 ate *exactly* two meals in the restaurant. (2)

4.4 The following table is given to assist in the calculation of independent events:

		Product Rule
Independent Events	$P(A \text{ and } B)$	$P(A) \times P(B)$

The following contingency table illustrates the voting pattern for voters that have voted for the Progressive Party (P) in a housing complex in Cape Town.

Table 1:

	P	not P	Total
M-Male	80	20	100
not M-Female	48	12	60
Total	128	32	160

The following contingency table illustrates the voting pattern for voters that have voted for the Conservative Party (C) in a hostel complex in Johannesburg.

Table 2:

	C	not C	Total
M-Male	30	270	300
not M- Female	4	396	400
Total	34	666	700

4.4.1 Are the events P and M in table 1 dependent or independent? Show all the calculations. (4)

4.4.2 Are the events C and M in table 2 dependent or independent? Show all the calculations. (4)

4.5 The following table is given to assist in the calculation of mutually exclusive events and independent events.

		Addition Rule
Mutual Exclusive Events	$P(A \text{ or } B)$	$P(A) + P(B)$
Independent Events	$P(A \text{ or } B)$	$P(A) + P(B) - P(A \text{ and } B)$

If $P(A) = 0,5$, and $P(B) = 0,4$ find $P(A \text{ or } B)$ if:

4.5.1 A and B are mutually exclusive events. (3)

4.5.2 A and B are independent events. (5)

[25]

GRAND TOTAL: {100}

THE END OF YOUR QUESTION PAPER! ☺

