

**UNIVERSITY OF FORT HARE**

**ALICE CAMPUS**

**MAM 311/EDM 312**

**BACHELOR OF EDUCATION: YEAR 3**

**JUNE EXAMINATIONS**

**2023**

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**Subject: MATHEMATICS METHOD**

**Time: 3 Hours**

**Marks: 100**

**This paper consists of 5 pages including the cover page**

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**Internal Moderator: Ms N Bambiso**

**Instructions:**

- 1. Answer all 5 questions**
- 2. Use the mark allocation as a guide when giving responses**
- 3. You will require a scientific calculator and a mathematics set**
- 4. Where possible, use tables, graphs or diagrams to enhance your answers**

**DO NOT TURN THE PAGE BEFORE BEING TOLD TO DO SO**

## QUESTION 1

1.1 Define 'mathematics' according to CAPS Grade 7-9 and also outline the different processes and what it aims to develop. (5)

1.2 Mathematics is perceived to be one of the most difficult subjects for learners that may cause anxiety. Hadfield and McNeil (1994) propose a *model of mathematics anxiety* that revolves around three main factors. Name and explain these three factors and show how does it relates to anxiety in the mathematics classroom (6)

1.3 Both learners and teachers are experiencing anxiety in the mathematics classroom. Give FIVE reasons for these feelings of anxiety among learners. (5)

1.4 Explain the beliefs about the nature of mathematics according to the main two schools of thoughts of absolutism and fallibilism. (4)

[20]

## QUESTION 2

2.1 Consider the following action(s) by a mathematics teacher:

*"The teacher provides opportunities for learners to share mathematical ideas with others and to problem solve"*

(a) Why is sharing ideas in mathematics an important part of mathematics learning? (3)

(b) Problem-solving is an integral part of mathematics learning. How would you use group work to promote problem-solving in your mathematics classroom? (3)

2.2 Study the table below and answer the questions (5)

x	y
1	1
2	7
3	17
5	49
9	161

(a) Write a mathematical rule for the following table: (3)

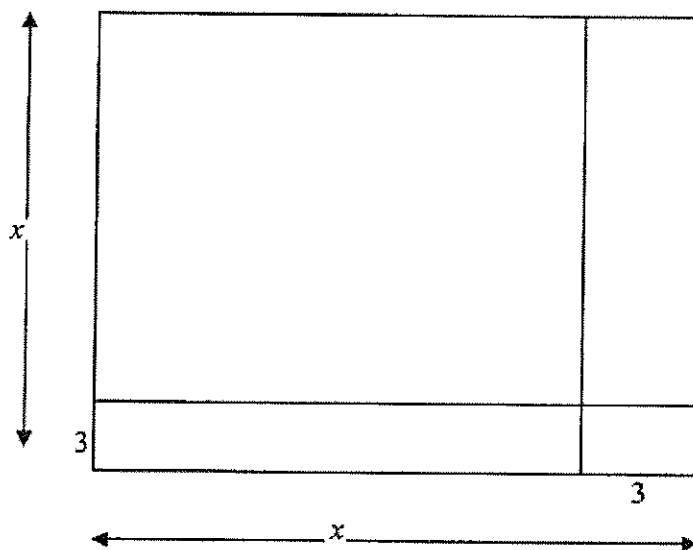
(b) Use your rule to work out the value of  $y$  if  $x = 51$

(2)

2.3 Mathematics is also used across the curriculum in other subjects. Explain how mathematics is integrated into other subjects and giving FIVE relevant examples of how mathematics is applied in each subject you mention.

2.4 Consider the diagram below and use it to prove that:

$$(x - 3)^2 = x^2 - 6x + 9 \text{ (DO NOT USE THE FOIL METHOD!!!)}$$



(5)

[21]

(5)

### QUESTION 3

3.1 Mention the general aim of the CAPS (Grade R-12) curriculum and also outline the FOUR main purposes it envisages to accomplish

(3)

3.2 Mathematics is regarded as a *universal part of human culture* and plays a vital role in many aspects of modern life.

Give THREE REASONS, within the context of the mentioned statement, why all learners should pursue mathematics.

3.3 To develop essential mathematical skills the learner should “*develop number vocabulary, number concept, calculation and application skills*”

The following table represent the number of terms (n) and the values ( $T_n$ ) in a particular number pattern: (3)

Number of term (n)	1	2	3	y	600
Value ( $T_n$ )	- 6	- 10	- 14	- 442	x

- (1)  
(2)
- (a) Show your Grade 9 learners how to determine the general rule for this particular number pattern. (2) [16]
- (b) Determine the value of x in the table.
- (c) Determine the value of y in the table
- (d) What particular ‘*number concept*’ and ‘*application skill*’ would your learners develop after this lesson?

**QUESTION 4** (1)  
(2)

4.1 Mathematics enables learners to “*collect, analyse and organise quantitative data to evaluate and critique conclusions*”

- (a) In which content area of mathematics is this likely to happen?
- (b) Why should mathematics learners “*critique conclusions?*” (2)

4.2 A chess team consist of 10 players who have accumulated the following number of points out of a maximum of 100 points during the year: (1)

62 53 39 34 76 42 56 40 23 68 (2)

- (2)
- (a) Calculate the *median* energy level of these players.
- (b) Write down the mode in the data. (2)
- (c) Determine the *mean* energy level. (2)
- (d) Determine the standard deviation of the data.
- (e) Determine the variance of the data. (3)
- (f) How many of the players fall within ONE standard deviation of the mean?

(5)

- (g) By observing the number of players who fall within ONE standard deviation of the mean, what does it say about the quality of the players? [22]  
 Motivate your answer.

4.3 Name the FIVE content areas for Mathematics that is included in the CAPS (Senior Phase) curriculum

**QUESTION 5**

5.1 The following two statements show “errors” or “misconceptions” made by learners in Algebra by Grade 8 learners (2)

- (1)  $a + b = ab$  (2)  
 (2)  $a \times a = 2a$  (2)

For each “misconception” above,

- (a) State how you think this “misconception” came about (1)  
 (b) Indicate how you would address this “misconception” in class and lead learners to the correct statement. (2)

5.2 You want to teach Ratio and Proportion to your Grade 9 learners Explain to your learners what is: (2)

- (a) ratio  
 (b) proportion

5.3 Name the TWO types of proportion to your learners.

5.4 The exchange rate of the rand (R) against the euro (€) on a particular day is given as follows (1)  
(2)

Euro (€)	400	X	2000
Rand (R)	2 960	925	y

- (a) What type of proportion does the table above suggest?  
 (b) Show your learners how to determine the values of x and y. (5)

5.5 Define ‘assessment’ for mathematics (Gr 7-9) as prescribed by CAPS and then outline the FOUR STEPS in the assessment process. (4)

5.6 Continuous Assessment (CASS) is regarded as an important component of the CAPS outline. [21]

Name the FOUR cognitive levels for assessment with their respective weightings (%)

**Grand Total: 100**

**End**

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