

UNIVERSITY OF FORT HARE

EAST LONDON CAMPUS

MEE212E

Mathematics Education 2 (English)

BACHELOR OF EDUCATION

Year 2

June 2023

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Time: 3 Hours

Subject: Mathematics Education 2 - English

Marks: 100

This paper consists of 7 pages including the cover page

Examiners
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Internal Moderator
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Instructions:

1. There are four compulsory questions in this examination paper.
2. Answer ALL questions.
3. Please number your questions correctly.
4. No calculators are allowed to be used in this exam.
5. Please ensure that your student number is clearly written on the front page of your examination book.

QUESTION 1: Numeracy crises in South African schools

"Mathematics is in crisis in SA despite it being a gateway subject for higher education and career options"

- 1.1 List and explain 5 reasons why mathematics in South Africa is in crises. (25)
- 1.2 List the content areas that we focus on in the Foundation Phase? (2)
- 1.3 Which content area is the main focus in Grades R-3 and why? (3)

[30 marks]

QUESTION 2: Methods of Teaching Mathematics

"In order to succeed in teaching mathematics, teachers should be aware of different teaching methods so, they can employ this knowledge as a basis of their mathematics education strategies"

2.1 Discuss the following:

- 2.1.2 The Traditional method of teaching mathematics. (5)
- 2.1.2 The Problem-solving method of teaching mathematics. (5)
- 2.1.3 The Discovery method of teaching mathematics. (5)

2.2 Multiple Choice: Write down only the question number and the letter of your choice

- 2.2.1 Which of the following best describes how we develop knowledge, from the perspective of a constructivist? (2)
- a. We are born with most of our knowledge.
 - b. We develop knowledge by engaging with others and continually learning as we go.
 - c. We are primarily sponges that absorb what we are told by authority figures.
 - d. Knowledge can only be gained by going to school.

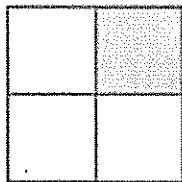
2.2.2 These activities describe what learning method? (lecture, drill and practice, rote learning, multiple choice tests). (2)

- a) Constructivism
- b) Behaviourism
- c) Cognitivism
- d) None of the above

2.2.3 These activities describe what learning method? (Discovery, collaborative group work, scaffolding, self-guided learning based on personal experience, peer grading and review). (2)

- a) Constructivism
- b) Behaviourism
- c) Cognitivism
- d) Connectivism

2.2.4 What is the decimal of the shaded part? (1)



- a) 0.20
- b) 0.25
- c) 0.50
- d) 0.75

2.3 Polya's major contribution to mathematics is for his work in problem solving.

2.3.1 Explain Polya's four- step approach to problem solving. (5)

2.4 In mathematics, the "things" that we quantify can either be discrete or continuous.

Explain what is meant by "discrete" and "continuous" counting.

(3)

[30 marks]**QUESTION 3 (Show all your working. No CALCULATORS are allowed)**

By studying numerical relationships that exhibit patterns, we can learn much about mathematics and have a lot of fun doing so. A very familiar pattern is found in the ordinary "times" multiplication table.

3.1 Study the multiplication table for 9 below and explain the pattern to your learners. (4)

$1 \times 9 = 9$
$2 \times 9 = 18$
$3 \times 9 = 27$
$4 \times 9 = 36$
$5 \times 9 = 45$
$6 \times 9 = 54$
$7 \times 9 = 63$
$8 \times 9 = 72$
$9 \times 9 = 81$
$10 \times 9 = 90$

3.2 Using mathematical laws that are applied to 'multiplication, explain the following problem to your Foundation Phase learners. (1)

$$9 \times 3 \quad \text{and} \quad 3 \times 9$$

3.3 The first number in a pattern is 5. The pattern follows the rule "Add 3". What are the next 4 numbers in the pattern? (1)

- a) 1, 4, 7, 10
- b) 5, 10, 15, 20
- c) 8, 11, 14, 17
- d) 3, 6, 9, 13

3.4 Caleb wants to rent a boat. Boat rentals cost R14.50 for a half hour. If Caleb rents a boat for one hour and forty-five minutes, how much will it cost him? (2)

3.5 Dezné wants to organize her books in order of most number of pages to least number of pages. Dezné's longest book has 396 pages and her shortest book has one-fourth as many pages as the longest. If the book in the middle of her shelf has three times the number of pages of the shortest book, then how many pages does the middle book have? (2)

3.6 Bernine is stuffing envelopes. She has eight hours to complete the task, and there are 1,500 envelopes. The first hour, Bernine stuffs 135 envelopes. The second hour she stuffs 141 envelopes. How many envelopes more envelopes will Bernine need to stuff in order to finish the job? (2)

3.7 Georga is baking cookies. She bakes three dozen oatmeal raisin cookies, two dozen sugar cookies, and four dozen chocolate chip cookies. Georga gives away two dozen oatmeal raisin cookies, 1.5 dozen sugar cookies, and 2.5 dozen chocolate chip cookies. How many total cookies does she keep? (2)

3.8 Siyanda is having a concert in a hall. He invited 778 people. He ordered 350 pies to be sold at the concert. 89 people cannot come to the concert. How many people will be at Siyanda's concert? (2)

3.9 The coach bought 6 extra-large pizzas for the team. There were 16 slices in each pizza. After the team ate some of the slices, there were 9 slices left. How many slices of pizza did the team eat? (2)

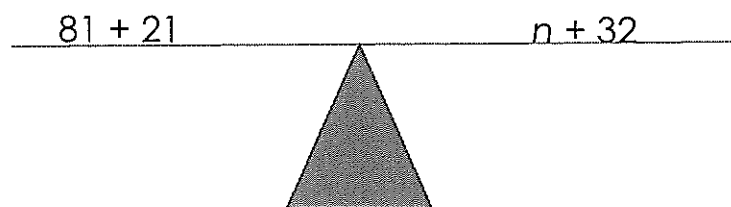
3.10 Traci and Pam are going on a 159 Km hike. Traci's backpack weighs 35kg. Pam's backpack weighs 7kg less. They hike 37km on the first day. How many kilometres do they have left? (2)

3.11 $644 + 393 \square 646 + 391$

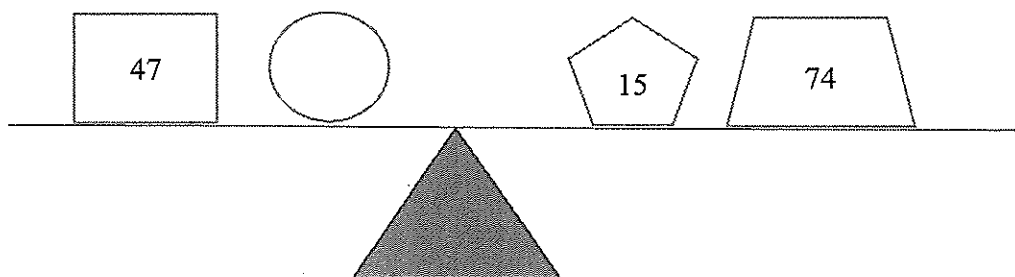
Put $<$; $>$ or $=$ in place of \square (2)

3.12 Taxis are waiting to pick up passengers at the taxi rank. There are 3 taxis waiting at each pick up point. There are 4 pick-up points. How many taxis are in the rank? (2)

3.13 We need to balance both sides of the equation. What is n ? (2)



3.14 What is the value of the circle? (2)



3.15 Use the column method to show

$$1258 + 364 =$$

(2)

[30 marks]

QUESTION 4: PLANNING FOR TEACHING AND LEARNING

Amanda is a new **grade 1** teacher. She needs your help to plan her mathematics lesson for term 1. She needs help with the following components of a lesson plan for teaching and learning:

Content Area: Numbers, operations and relationships

Topic: Number symbols and number names

Concept and Skill: Write number names and number symbols from 11 up to 25

- | | |
|---|-----|
| 4.1 Lesson aims. | (2) |
| 4.2 Lesson Introduction. | (4) |
| 4.3 Two resources to support teaching and learning. | (2) |
| 4.5 Assessment. | (2) |

[10 marks]

TOTAL [100]

END OF EXAMINATION