UNIVERSITY OF FORT HARE

MATHEMATICS EDUCATION 1

ENGLISH

MEE 121E

EXAMINATION

OCTOBER

YEAR 2019

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Time: 3 hours

Subject: Mathematics Education 1: English Paper

Marks: 100 marks

This paper consists of 12 pages including the cover page

Internal Examiners
Ms. K.Hackmack

Internal Moderator
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INSTRUCTIONS

- Please read the instructions carefully.
- You need to answer all the questions in your examination book.
- You can use the last page of the examination book for your working out but please mark it rough work.
- You may have a ruler but you may not use a calculator

Question 1: Knowledge of Curriculum

a) Look at the table below, it lists the counting and subtraction and addition number ranges that the CAPS document outlines is the **minimum requirements** for the Foundation Phase. Draw a similar table in your exam book and fill in the missing information. **(6 marks)**

	Counting Number Range	**Addition and subtraction Number Range**	**Know bonds up to**
Grade R	Count at least 10 objects reliably	Verbally solve problems up to 10	None
Grade 1	Estimate and count at least 50 objects everyday reliably	Add and subtract up to 20	Practice number bonds up to **?**
Grade 2	**?**	Add and subtract up to **?**	**?**
Grade 3	**?**	Add and subtract up to 999	**?**

b) State whether the following statements are true of false. **(3 marks)**

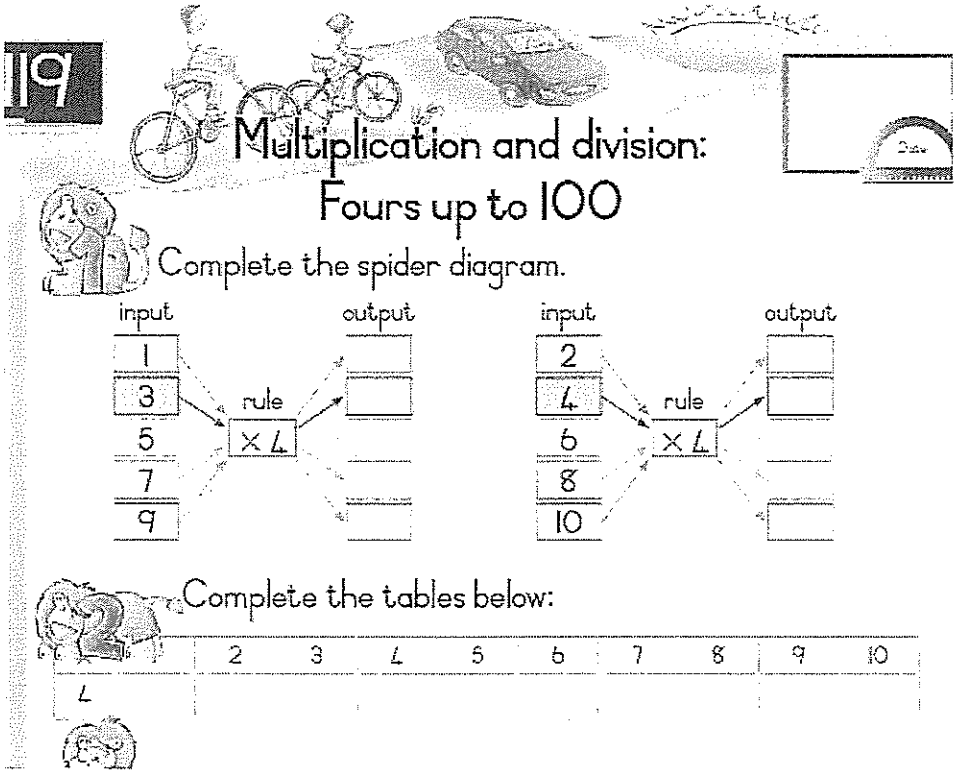
i) There are 5 content areas in the Foundation Phase Mathematics curriculum.

ii) The content area "Numbers, Operations and Relationships" has the least weighting in the Foundation Phase Mathematics.

iii) Mathematics is the one of the 5 subjects taught in the Foundation Phase.

c) List two resources that the CAPS document recommends for Foundation Phase. **(1 mark)**

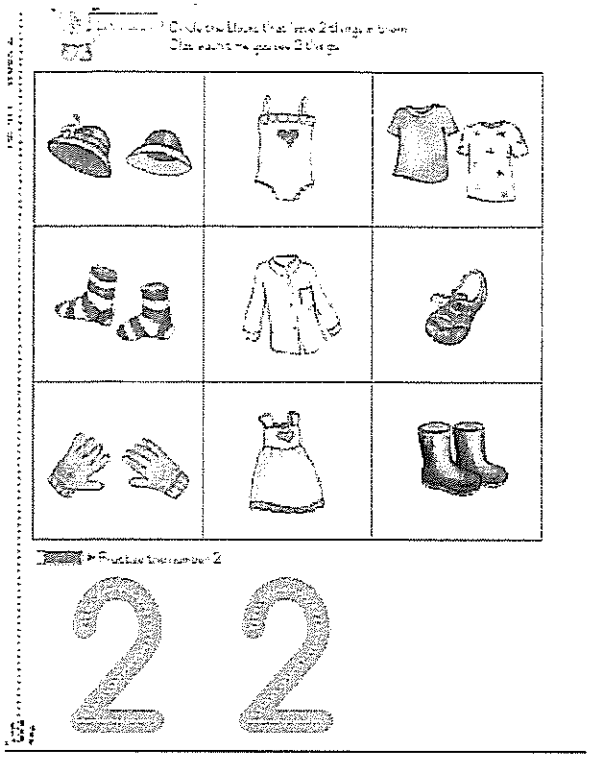
d) The following extract, is from one of the Foundation Workbooks supplied by the Department of Education. (Do **not** do the activity). Which grade was this activity designed for? Explain your reasoning. **(2 marks)**



e) The learner activity shown <u>below</u> has been taken from the department of education workbook. **(2 marks)**

i) Which Grade do and think this activity is designed for?

ii) Why do you think it is applicable for this Grade?



f) The Mathematics CAPS document for the Foundation Phase states that you need to have mental mathematics as part of your daily mathematics lesson. What is the purpose and benefit of mental mathematics? **(2 marks)**

[16 marks]

Question 2: Content Knowledge and error analysis

a) What is the value of 5 in each of these numbers. Write the answer in numbers. **(5 marks)**

i) 154 289

ii) 5 834 974

iii) 8 382 705

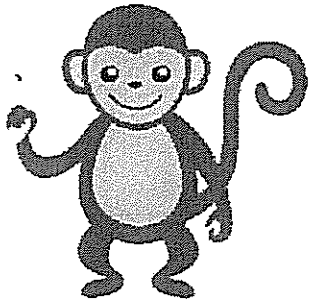
iv) 563 008

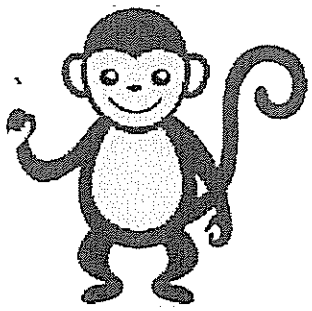
v) 413 978 950

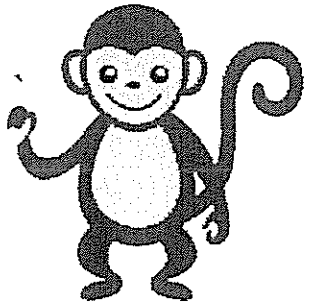
b) Read through the story of the monkeys and answer the following questions based on the monkey mathematics problem.

i) How many bananas were in the pile when the monkeys went to bed? **(6 marks)**

ii) Did each monkey end up getting an equal number of bananas? Explain your answer. **(6 marks)**







Ref: Wits Maths Circle Problem

Three monkeys, Mandy, Milly and Moses, collected a. huge pile of bananas that they were going to share. They put all the bananas together in a big pile and went to sleep. During the night, Mandy woke up hungry. She ate one banana and divided the rest of the bananas into three equal piles. She took one of the piles off into the forest to hide them away for herself.

A little while late Milly woke up hungry. She ate one banana and divided the rest of the bananas into three equal piles. She took one of the piles off into the forest to hide them away for herself.

And just before morning Moses woke up hungry. He ate one banana and divided the rest of the bananas into three equal piles. He took one of the piles off into the forest to hide them away for

c) The learners were given with the following mathematics problem to solve 36 +86. One of the learners wrote the problem in this way

36 +
86

Then she wrote the following answer

36 +
86
1112

Briefly explain what common mistake the learner is making and why she is making this particular mistake. **(2 marks)**

d) Look at the following numbers and write the next **two** numbers in the sequence. You only need to write the next two numbers in your exam book. (**5**

i) 77: 49; 36; __; __ **(2 marks)**

ii) Look at the following pattern and write the missing numbers in your examination book. **(3 marks)**

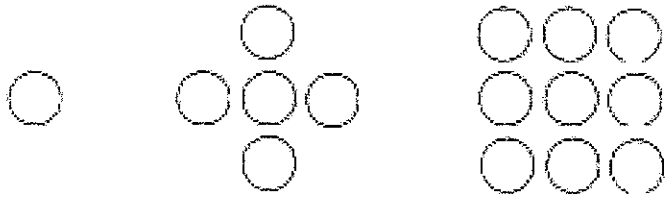


fig.1 fig.2 fig.3

Picture (figure)	1	2	6	25	50
No of circles	1	5		p	

e) In question d) above you were asked to find the pattern and write the next two numbers in the sequence. List **two** mathematical content areas that you used to find the answers to the question. **(2 marks)**

[26 marks]

Question 3 How children learn mathematics

a) The following lesson plan was used during School Experience. What multiple intelligences has been included in the lesson? You need to name the multiple intelligence(s) and explain how it was catered for in the lesson. **(15 marks)**

b) Which multiple intelligence(s) have been omitted? **(5 marks)**

Date	Grade	Number in Class	Lesson Duration	Lesson Plan
4 June 2019	Grade 3	37	60 minutes	Number 8

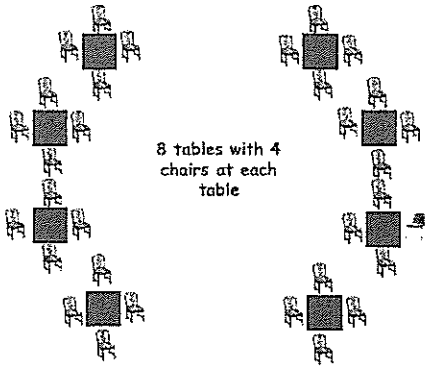
1. CAPS REFERENCES

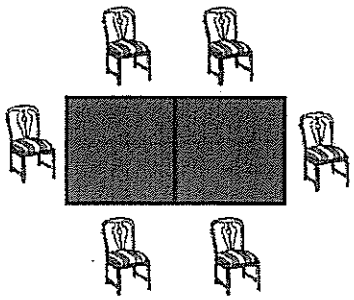
Subject	Foundation Phase Mathematics
Content Area	Measurement
Topic	Area and Perimeter
Concepts/Skills	Explore the concept of area and perimeter
Page Reference	page 418 &419 in CAPS POLICY DOCUMENT

2. **LESSON AIMS** (what new knowledge/skills/etc., should the learners be able to demonstrate by the end of the lesson)

Lesson Aims	• Have an understanding of the difference between perimeter and area. • identify that perimeter is the distance around a shape • The students will be able to recognize that shapes with different perimeters may have the same area. • How to calculate area

3. **INTRODUCTION** (Includes all learners/attention grabbing/ links to prior knowledge and topic/set out aims for lesson)

Introduction	Seat the learners on the mat. Ask Question 1,2, 3,4,5. Read the book Spaghetti and Meatballs for All! It is a story about Mr. and Mrs. Comfort, who are busily preparing a feast **(Ask Question 6)** and arranging 8 tables and 32 chairs so that all the guests will have a seat. 

	As guests arrive, they all have their own ideas about how to rearrange the tables so that different-size groups can sit together. Mrs. Comfort protests, **(Ask Question 7)** knowing that there will be seating problems later, but her protests are ignored. The party becomes a cheerful confusion of rearranged tables, chairs, plates, glasses, and food. **(Ask Question 8)**  After they've tried six different combinations, (Ask Question 9) they go back to their original setup and the guests finally get their fill of spaghetti and meatballs. (Ask Question 10).
Questions	1. Who knows what a family reunion is? 2. Has anyone here been to a family reunion? 3. Who usually attends family reunions or parties? 4. What kinds of food do you usually eat at a big get-together? 5. Who knows how to make spaghetti and meatballs? How? 6. If there are 4 people at each table, how many tables and chairs should they rent? 7. What is Mrs Comfort worried about? 8. How many chairs did we lose? Why? 9. Are there enough seats for the 12 people now? 10. What did they have to do with the tables in order for all 32 people to have a seat?
Resources	None

Lesson Development	• In the book Mrs. Comfort doesn't use mathematical terms to describe her seating plans, but she is really talking about area and perimeter. • Go through the book again with the class and use the words 'area' and 'perimeter' to talk about the size of each arrangement and the number of people it seats. • Remind learners that perimeter is the area around the desk and area is the surface area covered by the desktop. • Learners go back to their tables and sit in their allocated groups of 4 learners. (9 groups) • Give each group 32 small square tiles (to represent the chairs) and 8 different coloured square tiles to represent the desks. Ask (Question 1) them to find out how many different ways to arrange eight tables to seat the guests. • They need to draw each new table arrangement they make in the group. They need to figure out how many people can be seated at each arrangement. • After students have completed this task then ask them Question 2, 3 and 4. **Early Finishers:** The early finishers can either: • Take a book and read quietly • Take the lego and quietly make a yard for the dog that is 10 blocks by 7 blocks. • They can explore which is the smallest yard they can make and the biggest yard. **<u>Group work/ Mat work:</u>** Call each group onto the mat. • Ask them to put a tablecloth over the desk. Remind them that this is the area – the place that the cloth covers. • Ask question 6 • At first Mrs. Comfort arranged each table individually, Draw this on your white board • Ask question 7 • Explain how we calculate the area using length x width = area
Questions	1. How many ways can you arrange the 8 tables to accommodate the guests? 2. Suppose there are only 12 people at the family reunion, what different table arrangements are possible? 3. Which table arrangement would use the least number of tables? 4. Which arrangement of the tables would use the least number of tables? 5. What do you notice about the areas and perimeters of the arrangements you made? 6. Where else can area and perimeter be found in real life?

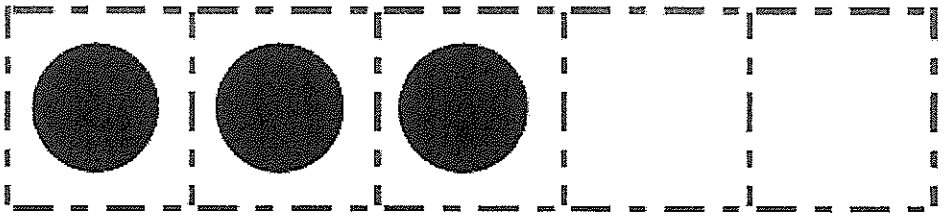
	7. Show me the perimeter and area of the tables? 8. We calculate the area by length x breath? What is the area of one table if it is 2 m x 3 m? 9. Get learners to calculate the area of a book. 10. Call next group.
Resources	288 Tiles for the chairs, 72 different coloured tiles/paper for the tables paper, pens, extra tiles and 5 white boards and markers

4. **CONCLUSION** (Draws the lesson in/provide an overview or summary of learning/ learners reflect on their learning)

Conclusion	In a short plenary, ask the learners what they remember about the lesson.
Questions	1. What was Mrs Comfort's problem? 2. What is the difference between area and perimeter 3. How do we measure the area of an object?

c) Look at the following **two** aspects that a teacher has used to teach a lesson. Using Bruner's 3 model theory, state how Bruner would have labeled each one of the stages. AND explain how each one will help the children learn mathematics. **(4 marks)**

i)



ii)

$$3 + 2 = 5$$

d) List the two kinds of constructivism mentioned during your lectures. **(2 marks)**

e) Explain what is meant by the terms mean in the social constructivist view of teaching and learning

- scaffolding in terms and
- zone of proximal development
- tools **(6 marks)**

[32 marks]

Question 4: Using ICT in the classroom

a) Outline the benefits and challenges of using technology in the classroom. **(10 marks)**

b) Describe what guidelines you will keep in mind when evaluating whether or not a resource, on the internet is suitable, for your classroom. **(5 marks)**

c) Bielefeltd (2014) said, "Technology is not a teacher even with the best software the technology is not the professional in the classroom". Do you agree or disagree with Bielefeltd? Explain your answer. **(5 marks)**

d) Describe the difference between flipped and blended learning classrooms. **(6 marks).**

[26 marks]

Total Exam is100 marks

End of Examination