UNIVERSITY OF JOHANNESBURG

FACULTY	: Education
DEPARTMENT	: CHILDHOOD EDUCATION
CAMPUS	: SWC
MODULE	: MATINA3
SEMESTER	: First
SUBMISSION DATE:	: 18 June 2020

DATE	: June 2020	**SESSION**	
ASSESSOR(S)	: Mr E LIBUSHA		
MODERATOR	:Dr L. Abdulhamid (University of the Witwatersrand)		
DURATION	: Three days (72 hours)	**MARKS**	: 100

INSTRUCTIONS

Read the following instructions carefully before answering the questions.

1. This is an exam equivalence. It is a take home exam.
2. Read all question carefully and answer all questions.
3. This exam should be **typed**. Use Arial theme and a font 12.

Question 1 [quadrilaterals]

1.1 Read the following dialogue and answer the question below:

Mr Hadebe was teaching quadrilaterals to the grade 6 learners, the following conversation was heard as he was teaching:

Teacher: A rectangle is a quadrilateral with all angles equal
Learner: But sir, a square also has all angles equal
Teacher: Yes, you are right. A square is also a rectangle
Learner: Sir, can I say “a square is a quadrilateral with all angles equal”?
Teacher: No. This is not sufficient for a definition of a square
Learner: But why sir? You said the square is a rectangle. Why can’t I use the same definition? I am confused

If you were the teacher in this classroom, how will you support a learner so that the learner can understand why you cannot use “A square is a quadrilateral with all angles equal” as a definition for a square? Give a full description to elaborate on the method you will use as part of intervention to support the learner to gain conceptual understanding on how definition can be derived in quadrilaterals. (Also use diagrams to elaborate) 15

Marking guide		
Explain why the definition is wrong	3	✓ Correct ✓ Clear ✓ Own words
Explain how definition are made	3	✓ Correct ✓ Clear ✓ Own words
Diagrams with the highlighting of the properties	3	✓ Correct ✓ Clear ✓ Own words
Explain the concept of interrelationship between quadrilaterals	3	✓ Correct ✓ Clear ✓ Own words
Explain what should be done to make the definition plausible	3	✓ Correct ✓ Clear ✓ Own words

1.2 Govender and De Villiers (2004) discuss the manner in which definitions can be obtained in Geometry. [De Villiers, M., & Govender, R. (2004). A dynamic approach to quadrilateral definitions. *Pythagoras*, 2004(59), 34-45] In order to differentiate between correct, incorrect and incomplete definitions. They use the terms like:

1. A definition with necessary insufficient conditions
2. correct uneconomical definition
3. Correct economical definition

With the use of a Kite which is a quadrilateral, use your own word to explain what is meant by the above three terms and give an example with an explanation why the example you chose is good enough to be used as explanation of the terms above. 12

,

Three definitions using own words	6	Two marks each for correct definition linking well to the De Villiers's idea
Three examples	3	One mark per correct example
Explanation of each example	3	One mark per explanation

[27]

Question 2 [triangles]

2.1. Give a brief description on how a rectangle can be formed using triangles through transformation. Use a definition of a rectangle derived from the transformation to justify your reasoning for transformation. By means of using a diagram, explain how all the six properties of …. can be derived from the above transformation) 10

Description	2	
Diagram	2	
Explanation of properties	6	

2.2 Barcelon (2019) argue that mathematics is like a chain that cannot be pulled upon when one link is missing. Having all pieces of the chain will make it easier for one to create a good chain that can be depended upon in times of need. Use your own words to explain the link between transformation Geometry, congruency and similarity in triangles. 10

What transformation geometry is all about	2	
What congruency and similarity is all about	2	
What is the link between the two	2	
Make use of a diagram to show the link between the two	4	

[20]

Question 3 [Mensuration]

3.1 Give a step by step guide to explain how you will teach learners to calculate the area of a parallelogram without using the parallelogram formula. 12

Introduction	2	
Explain what the calculation of area is all about	2	
Required pre knowledge	2	
Examples to use	2	
Method to use	2	
Assessment to use	2	

3.2 James said that "a pyramid and a tetrahedron is one and the same thing". On the other hand, Busi does not agree. Use your own words to explain the difference between a Tetrahedron and a triangular pyramid and also explain how you can convince other learners that Busi and James's reasoning are both justified. 6

The difference between the two	2	
Justification of Busi's claim	2	
Justification of James's claim	2	

[18]

Question 4 [Data Handling]

Two Mathematics classes, 5A and 5B are in competition to see which class performed better in mathematics in the June Examination. The marks of the leaners are recorded below. Both classes have 20 learners. (Marks are given in %).

Grade 5A	Grade 5B
88	78
67	54
34	90
33	69
57	77
45	82
100	68
49	66
25	78
44	65
98	67
89	55
90	72
82	83

33	56
90	75
56	50
20	66
75	25
88	23

4.1 What is the mean mark of the learners in Class 5A and what is the mean mark of the learners in Class 5B? 2

4.2 What can you deduce from the comparison of these two means in terms of performance between the two classes? 2

4.3 Using a Histogram (use the interval 0-10,11-20, 21-30…), explain which class performed better 8

4.4 Draw a box-and-whisker plot for both classes on the same number line. What would you say about the nature of the distribution of learner performance in each class? 10

4.5 What can you deduce from the comparison of all your above data in terms of performance between the two classes as your overall conclusion? 3

	Marking guide line	
4.1	Calculation of the mean	One mark per correct answer
4.2	Interpretation of the mean	2 marks for the interpretation
4.3	Histogram for 5A Histogram for 5B Interpretation of 5A histogram Interpretation of 5B histogram Comparison and conclusion	2 2 1 1 2
4.4	Box and whiskers Nature of distribution in 5A Nature of distribution in 5B Overall conclusion supported by box-and whisker	5 2 2 1
4.5	Overall conclusion	3

[25]

Question 5 [Probability]

5.1	What do you understand by the term theoretical probability and experimental probability? Give one example of each	2
5.2	Provide one similarity and one difference between theoretical probability and experimental probability.	2
5.3	Give a brief description on how experimental probability can be used to support learners understanding of theoretical probability	6

	Marking guide		
5.1	Definition	2	One mark for each correct definition
5.2	Example	2	One mark for each correct example
5.3	Linking between experimental and theoretical probability	6	Correct (2) Clear (2) Own word (2)

[10]

Total:100