Tutorial Letter 102/0/2023

Mathematics 1 for Teachers

MTE1501

Year module

Mathematics Education

This tutorial letter contains important information about your module.

BARCODE

Dear Student

Assignment Four:

Assignment 04: 50 marks

Contributes 40% to final pass mark

Unique number: 345547

Due date: 20 August 2023 at 22:00

Assessment Criteria

This assignment covers units 1-4 of MTE 1501, containing the following contents:

- The history, views, and uses of mathematics in various civilizations across the world;
- Approaches to teaching mathematics; levels of learner engagement in the instruction;
- Conceptual and procedural knowledge, mathematical proficiency, and construction of mathematics ideas;
- Number concepts and representations, place value, number operations, real numbers;
- 2-Dimensional shapes and 3-Dimensional objects

Instructions

This assignment consists of 50 multiple-choice questions. Select the correct answer/statement from the four options for each question and write down the number (1, 2, 3, or 4) of the correct answer. Few has been selected where you will have to show your workings.

Assignment 4 questions

1. Read paragraph 1.4 of your Tutorial Letter 501 and answer the following question:

Amongst the ideas of the **early mathematics philosophers**, which statement is NOT true?

1) Aristotle uses empirical study emanating from experiments and observations.
2) Plato reasoned that mathematics is based on experimentation and abstraction.
3) Hilbert believed that mathematics can exist in the formal having concrete representations in the mind.
4) Aristotle said that we can understand mathematics through experimentation, abstraction, and observation

2. Aristotle's beliefs on the nature of mathematics are based on the following:

1) the objects of mathematics had an existence on their own
2) the physical, the mathematical, and the theological into which knowledge could be divided.
3) ideas of mathematics could be viewed as a subset of the ideas
4) logicism, intuitionism, and experimentation.

3. In the "**modern" view of mathematics,** the following is true…

1) Mathematics exists in human creativity only.
2) Mathematical objects are not invented or created by humans.

3) A mathematics activity is not strictly governed by any one school of thought
4) Learning mathematics is restricted to real-life connections, signs, symbols, definitions, and rules

4. People have different views about Mathematics and that it is important to be learned at school. Which of the following is not how people view mathematics.

1) Without special brains you cannot do Mathematics
2) Mathematics is made up of symbols and not words.
3) Mathematics does not require a good memory.
4) Mathematics' goal is to find answers.

5. The Egyptians realised or practiced this content area first:
1) Arithmetic
2) Volume and area
3) Geometry
4) Measurement

6. Pictographs were discovered in Egypt and Mesopotamia from 3 000BC. The best definition of a pictogram is:
1) A form of abstract symbol used to represent quantities
2) A graph that displays complex statistical data
3) An ancient form of writing using abstract shapes
4) A visual representation using pictures that stand for quantities.

7. According to the constructivist view of learning, how do learners create knowledge?
1) By absorbing ideas as the teachers present them
2) By actively constructing their own reasoning and understanding.
3) Through passive observation and listening
4) By engaging in peer discussion

8. The **Lebombo bone found in Africa** may have been used to show…
1) Only six months of a calendar
2) a table of the prime products
3) A number with only two factors.
4) The Babylonians calendar

9. The significance of time was realised by the Babylonians according to (Bassarear, 2005). What was the Babylonian approach to dividing time during the day and night?

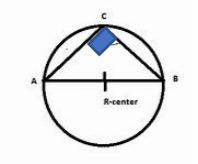
1) The day was divided into 24 hours and the night into 24r hours
2) Both the day was divided into 24 hours and the night into 12 hours.
3) Both the day and night were divided into 12 hours

4) The varying of the time for both the day and the night were not done in accordance to hours.

10. The **plane geometry** Assist learners to understand:

1) The study of all flat shapes and all solid objects in geometry
2) The study of flat, 2-D shapes like lines, circles, triangles, pentagons, etc
3) The study of only triangles and quadrilaterals like squares
4) The study of simple, uncomplicated geometry, or shapes in space

11. The shape is clearly explained by which school?



1) Pythagorean
2) Ionian
3) Eleatic
4) None of the above

12. The **Platonic solid *octahedron*** has

1) Eight equiangular faces.
2) Eight lateral faces
3) Eight edges and eight congruent faces
4) Four vertices, eight edges, and isosceles triangular faces

13. This is false about the "**relational understanding of mathematics**"

1) A learner connects different mathematical ideas with understanding
2) A learner remembers rules and formulae and can apply them in mathematics problems to reach the correct answer
3) A learner knows the mathematical facts and the methods to calculate correctly
4) A learner reaches the correct answer when they apply all the rules correctly

14. Looking at the five strands of mathematical proficiency of Kilpatrick et al (2001), what does it mean to have "**conceptual understanding**"?

1) To apply critical, creative, and self-regulated thought in mathematical tasks.
2) To enable learners to achieve high performance in mathematics.
3) To use the prescribed methods/procedures to solve a mathematical problem
4) To be to understand the standard concepts in a specific phase subject.
5) To carry steps easily from one step to the other in mathematical procedures/methods

15. According to Kilpatrick et al (2001:115), the following are the components making mathematics proficiency.

1) Adaptive reasoning and Conceptual understanding, procedural fluency,
2) Strategic proficiency, Cognitive understanding, and adaptive strategies.
3) Productive position, Conceptual reasoning, and procedural understanding
4) Conceptual understanding, procedural fluency, and adaptive reasoning

16. Which one of the following assessment items requires **problem-solving skills**?

1) What is the area of a right-angled triangle with a base of 8cm and the The perpendicular height of 9cm?
2) Use a cut-out equilateral triangle to illustrate how you will compare their sizes and their angles.
3) Find the length of the missing length of a right-angled triangle with a base of 8cm and the perpendicular height of 9cm?
4) How many faces and vertices does an octahedron have?

17. According to Nicholson (1992), what is the primary objective of a problem-solving task?

1) To engage learners in important mathematics development.
2) To encourage learner to follow predetermined procedures.
3) To promote quick solutions through well-known methods
4) To assess learners' ability to perform routine activities/problems.

18. An Intermediate Phase learner recognises that squares, rectangles, and parallelograms all have four sides and that two opposite sides in each of these shapes are the same length. At which level of **van Hiele's levels of geometric thought** is this learner?

1) Level 1: Analysis
2) Level 0: Visualization
3) Level 3: Formal deduction
4) Level 4: Rigour

19. This question is about your understanding of **dimensions**:

- *Zero dimension (0D) is a point that shows a <u>position</u> only*
- *One dimension (1D) is a line connecting two points; it has <u>length</u> as its one dimension*
- *Two dimensions (2D) is a shape with <u>length and width</u> as its two dimensions,*
- *Three dimensions (3D) is an object with <u>length, width, and height</u>(three dimensions).*

a. Which of the following can be used to describe the area of a floor tile?

1) The area of the floor tile is 900cm
2) The area of the floor tile is $900cm^2$
3) The area of the floor tile is $900cm^3$
4) The area of the floor tile is 900

b. Show your workings. (2)

20. You use a **number line** to explain to a learner what the opening calibration and the closing calibration will be if you have to add 0,3 and 0,4.

1) 0 and 1
2) 0.1 and 0,4
3) 0,3 and 1
4) 0 and 0,4

21. **Dienes blocks** are base 10 blocks that help to teach place value, addition and subtraction in the base 10 number system.

b. What will be the difference between (two blocks + four flats + five units) and (nine flats + seven longs/rods + nine units)?

1) Two flats + four flats + two longs/rods +six three units
2) Three blocks + three flats + eight longs/rods + four units
3) One blocks + four flats + two longs/rods +six three units
4) One blocks + three flats + eight longs/rods + four units

c. Show your workings. (2)

22. An important idea to understand when building number sense, is **equality,** which means**: that** what is to the left should be the same as what is to the right of an equal sign (=)? Which number will make the following equation true? 11-11×11+11= □

1) 0
2) +11
3) -99
4) 121

23. a. Which of the following is equal to 2x – 3y + 7x + 5y?

1) 7x + 10y
2) 11xy
3) 9x +8y
4) 9x +3y

c. Show your workings. (2)

24. Which of the following sentences best describes the difference between a *digit* and a *number*?

1) A digit is used everywhere, and digits are used in electronic devices, but numbers are used everywhere
2) Digits are made up of numeral symbols 0-9 which are used to make up a number
3) A digit is made up of numbers more than one
4) None of the above

25. Which one of the following numbers is **rational**:

1) $\sqrt{2}$
2) π
3) $\frac{100}{0}$
4) $\sqrt{144}$

26. What is the number represented by ∩∩∩ 𓏲 in the **Egyptian hieroglyphics**?

1) Thirty
2) Three
3) Three hundred
4) Thirty-three

27. Where on a number line would the **square root of 78** ($\sqrt{78}$) be situated? (Hint: think of the square numbers before and after 78)

1) On 39
2) On 9
3) Between 8 and 9
4) None of the above

28. a. What is the difference between the **values of the two 5s in 503,503**?

1) 502,5
2) 502,497
3) 499,497
4) 499,5

5) Show your workings. (2)

29. The difference between **integers and rational numbers** is:

1) Integers include negative numbers and rational numbers do not
2) Integers are only whole numbers and rational numbers include fractions
3) Rational numbers are the same as integers, there is no difference
4) Rational numbers include negative numbers and integers do not

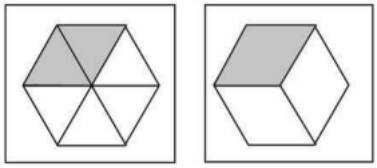
30. What is the recommended approach when teaching fractions concepts to learners?

1) Use symbolic form of fraction for immediate understanding.
2) Teach learners the symbolic form before explaining the fraction concept.
3) Emphasize correct pronunciation of fractions in words.
4) Introduce the meaning and relevance of the numerator and the denominator before understanding the fraction concept.

31. Which of the following numbers is the **smallest**? $\frac{14}{3}$ $\sqrt{21}$ $4\frac{3}{5}$ 456%

1) $\frac{14}{3}$
2) $\sqrt{21}$
3) 456%
4) $4\frac{3}{5}$

32. In the figure provided:



What is true about the statements given:

a) The shaded parts are the same
b) The shaded parts are similar
c) The shaded parts are equivalent
d) The shaded part are congruent

1) A and b
2) B and c
3) C and d
4) A and d

33. The following table gives the times of arrival at different bus terminals of a city-to-city bus travelling from Polokwane to Cape Town. The bus stays at each bus terminal for one hour 20 minutes. At what time will the bus leave the bus terminal Kimberly?

Bus terminal	Time of arrival	Time of departure
Polokwane	08:20	10:00
Johannesburg	15:00	
Kimberley	01:35	
Beaufort-West	09:00	
Worcester	18:25	

1) 02:15
2) 02:55
3) 16:40
4) 10:40

b. Show your workings. (2)

34. According to Holmes (1995), learners should be introduced to learning the concept of temperature…?

1) By memorizing temperature values for hot and cold objects.
2) By only using a thermometer to measure temperature
3) By comparing hot and cold objects, then measure their temperature using thermometer.
4) By relying on pictures and drawings to understand temperature concepts.

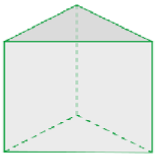
35. Which tally representation corresponds to the count of nine items?

1) One vertical line and eight horizontal lines
2) Nine vertical lines
3) Four vertical lines with one stroke
4) Two sets of four vertical lines with one set having one stroke.

36. Both the bar graph and the Histogram are used to represent data to represent the values of the information collected. Determine the difference between the bar graph and the histogram.

1) A histogram uses bars to represent data, while a bar graph uses rectangles.
2) A histogram is used for qualitative data, while a bar graph is used for quantitative data.
3) A histogram has bars separating by gaps, while a bar graph has adjacent bars.
4) A histogram displays frequency distribution for continuous data, while a bar graph shows discrete data.

37. The **3-D object** below is a …



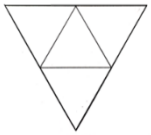
1) Triangular based pyramid
2) Rectangular based pyramid
3) Rectangular based prism
4) Triangular based prism

38. How many **interior angles** does the following 2-D shape have?



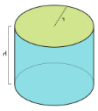
1) 5
2) 10
3) 8
4) None of the above

39. Which **3D object** can be folded from the net below?



1) The net cannot be folded into any 3-D object
2) Triangular based prism
3) Cone
4) Triangular based pyramid

40. Which of the following shapes are not a polyhedron?

 1)	 2)	 3)	 4)

Total marks 2= [40]

DECLARATION

I, ……

(Name & Surname)

Student number: ……

Module code: …….

Hereby declare the following:

I understand UNISA'S policy on plagiarism. This examination is my original work produced by myself. I have duly acknowledged all the other people's work (both electronic and print) through the proper reference techniques as stipulated in this module.

I have not copied the work of others and handed it in as my own. I have also not made my work available to any fellow students to submit as their own.

Signature:……..Date:…….