

Assignment Three

Assignment 3: 100 marks

Contributes 30% to final pass mark

Unique Number: 213891

Due date: 18 July 2023 at 22:00

Closes: 21 July 2023 at 22:00

Assessment criteria for this assignment

Like Assignments 1, Assignment 3 will address all work that is covered in units 1 to 4 of MTE 1501. You will be asked to demonstrate your gained knowledge and acquired skills on the following topics:

- **Mathematics in society:** history, views and uses of mathematics in various civilizations across the world;
- **Teaching and learning mathematics:** approaches to teaching mathematics and levels of learner engagement in the instruction; conceptual and procedural knowledge, mathematical proficiency and construction of mathematics ideas;
- **The concept of number:** number concepts, number representation, place value, mathematical operations and real numbers;
- **Development of spatial sense:** 2-Dimensional shapes and 3-Dimensional objects.

Instruction for this assignment

Some of the activities in this assignment have been drawn from tutorial letter 501 (study guide). The tasks will add up to 100, and this mark is made up from four units of MTE 1501 as follows:

Unit 1 = 10 marks

Unit 2 = 10 marks

Unit 3 = 40 marks

Unit 4 = 40 marks

In the table below we provide the tasks which you should do and submit on or before the due date as announced. Lastly, when writing Assignment 3 number your questions as indicated in the table below. We wish you all the best.

Assignment 3: Questions

3.1 LU1: MATHEMATICS IN SOCIETY

Read section 1.3: Defining Mathematics - in your study guide and provide the differences between the three views used to outline the mathematics consideration.
(10)

3.2 LU2: TEACHING AND LEARNING MATHEMATICS

3.3.1 Do the following:

1. Explain why the word “natural numbers” is used when referring to counting numbers
2. Which of the following statements is True or False? Where it is FALSE, provide an explanation for your answer.

- (a) No integer is an irrational number.
- (b) Every integer is a rational number.
- (c) Every integer is a whole number.

3. What are the place values of underlined numbers below:

a. 23, 61

b. 423, 658;

c. 23.0623.2.1

(5)

3.2.2 Mathematics should promote learning with relational understanding. Learning with understanding contributes to meaningful learning and enables students to cope with problem-solving.

Do Activity 3.7 No.4 to express the understanding that zero is described as a number by explaining the difference between the two inner circles. You can refer to Figure 3.5 or the rectangle below 3.7.
(5)

3.2.3 LU3: Do the following:

- a. Show how will you represent this PROBLEM below and write the number sentences to illustrate its appropriate representation.

There are 7 boxes. Each box contains five red apples and four green apples. How many apples are there? Provide two different representations for this scenario with two number sentences (expressions).
(6)

- b. Identify the properties representing the expressions developed from the red and green apples.
(4)

c. Do activity 2.5: Do not forget to do the Mind Map. (DO not develop the lesson plan). (15)

3.2.4 LU3:

a. Show with one activity how you will use a geoboard to develop spatial reasoning. In case one does not have a geoboard, other than buying a geoboard, show how you will improvise to teach the activity you chose. Specify the material needed, size and use a drawing to show the type of activity you would develop. (5)

b. Distinguish between the phrases “number concept” and “number sense”. Illustrate the difference with the illustration. (5)

c. Draw a number line to graph the following numbers: -4 ; 2.5 ; -0.6 ; $-\frac{5}{7}$; $\sqrt{2}$; 3 ; $\frac{3}{4}$; 4 . How will you select the opening number and the closing number for your calibrations? (5)

LU4: DEVELOPMENT OF SPACIAL SENSE

1. Define the following and provide examples to illustrate the differences clearly. (10)

- 1.1 Spatial sense
- 1.2 Objects
- 1.3 Shapes
- 1.4 Polygons
- 1.5 Polyhedron

2. 2-Dimensional shapes and 3-Dimensional objects

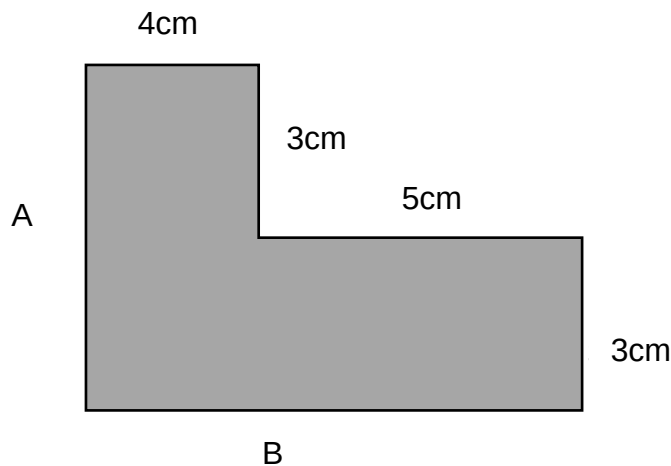
Complete the table below by providing an explanation verbally to a learner and provide an illustration of the statement with a sketch.

Statement	Verbal explanation	Sketch
A rectangular prism and a rectangular pyramid are the same.	(1)	(1)
Two different rectangular prisms can both have the same volume of 84 cm^3	(1)	(1)
A cube is a special cuboid	(1)	(1)
More than one platonic solids have triangular faces.	(1)	(1)

In a kite, the top angle and the bottom angle are always the same size.	(1)	(1)
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(10)

3. In calculating the perimeter and the area of the L shape below, the learner provided the following as his responses: (10)



Perimeters

$$\text{Area} = 4 \times 3 \times 3 \times 5 \times 3 = 540 \text{ cm}$$

$$A = 4 + 3 \text{ cm} = 7 \text{ cm}$$

$$B = 4 + 3 + 5 + 3 \text{ cm} = 15 \text{ cm}$$

$$A + B = 22 \text{ cm}$$

In order to assist this learner, you decided to use the Behaviourism practice than the Constructivism one. Show how best will you assist this learner to understand the two concepts as you engage him in the learning process. In the teaching process, highlight when you are going to apply either of the two reasoning processes: Inductive or deductive reasoning.

- Show one method you will provide to ensure this learner understands the process of the two concepts being Perimeter and Area.

4. Respond to questions on Sorting and Classifying shapes Activity 4.1 in your study guide:

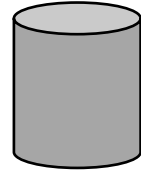
Sorting and classifying Classify shapes. You don't have to draw them, just provide numbers associated to the descriptions in question. (7)

According to the following criteria:

- (1) Shapes with curved edges
- (2) Three sides
- (3) Four sides
- (4) Opposite sides "go the same way" (parallelograms)
- (5) Shapes with "dents" (concave)

- (6) In what level of Van Hiele do questions 1 to 5 fall?
(7) Give a reason(s) for the answer you provided in question 6.

5. A polyhedron is defined as a three-dimensional object or figure with faces made up of polygons, straight edges and sharp corners or vertices.



A polyhedron is named according to the number of faces they have. The learner in a grade six class is confused and says this object is a polyhedron because its net has three faces which are two circles and one rectangle.

- Provide another object which is not a polyhedron and explain to this learner the properties of a polyhedron so that the understanding of this concept can be developed and remove the misconceptions and errors this learner has developed.
 - In your explanation, show how you will assist this learner to develop the correct understanding of this concept.
- (3)

Total Marks = 100

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