



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

**MATHEMATICAL LITERACY
EXEMPLAR PAPER - 2006**

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. An approved calculator may be used, unless otherwise stated.
4. ALL working details must be shown clearly.
5. ALL final answers must be rounded off to TWO decimal places, unless otherwise stated.
6. Start each question on a NEW page.
7. Write neatly and legibly.
8. Neatly cross out ALL rough work before handing in your answer book.
9. Re-read your work to check for errors before you hand in your answer book.

QUESTION 1

The following data is based on the rates of one of the South African commercial banks published in their rates brochure.

NOTE: ALL fees given below are grouped into two main categories, namely branch transactions (those done inside a branch) and ATM transactions (those done outside a branch at an ATM).

Type of transaction	Mzansi account	Bronze account		Silver account	
Monthly fee	0,00	0,00		31,50	
Minimum balance	not applicable	50,00		not applicable	
BRANCH TRANSACTIONS					
Cash withdrawal	8,00	0,90%; 16,25 minimum see note (1)		2,90;0,90% see note (2)	
Cash deposit	8,00	4,00;0,53% see note (2)		2,90;0,90% see note (2)	
Cheque deposit	0,00	0,00		0,00	
Balance enquiry	4,00	2,65		2,65	
ATM TRANSACTION					
		Own ATM	Other ATM	Own ATM	Other ATM
Cellphone top-up	Free	Free	11,40	Free	9,60;0,90% see note (2)
Cash withdrawal	4,00	4,70	11,40	2,90;0,90% see note (2)	9,60;0,90% see note (2)
Cash deposit	4,00	4,00;0,40% see note (2)	7,00;0,53% see note (2)	2,90;0,90% see note (2)	2,90;0,90% see note (2)
Cheque deposit	0,00	Free	Free	Free	Free
Balance enquiry	2,00	1,05	3,35	1,05	3,35
NOTES					
(1) '0,90%;16,25 minimum' means that the transaction fee is 0,90% of the transaction value with a minimum fee of 16,25					
(2) '2,90;0,90%' means there is a basic transaction fee of R2,90 and an additional fee of 0,90% of the transaction value					

Use the table on the previous page to answer the following question:

- 1.1 Find the following transactions fees from the table:
- 1.1.1 To make a balance enquiry from a Mzansi account inside the branch (1)
- 1.1.2 Write down the formula for a cash withdrawal from a Silver account inside the branch (2)
- 1.2 Calculate the transaction fee for a cash deposit of R200,00 from another bank's ATM if you have:
- 1.2.1 A Mzansi account (1)
- 1.2.2 A Silver account (3)
- 1.3 Nthabiseng withdraws R1 500,00 from her Bronze account inside the branch. Calculate the transaction fees that she will be charged. (3)
- 1.4 The cash withdrawals at OWN ATM for the following account are given as follows:
- Bronze account: R4,70
Silver account: $R2,90 + 0,009 \times \text{amount withdrawn}$
- 1.4.1 Use the information given above to complete the following table in your answer book:
- | Amount withdrawn (R) | R100 | R200 | R300 | R400 | R500 |
|--|------|------|------|------|------|
| Bronze account cash withdrawal fee (R) | | | | | |
| Silver account cash withdrawal fee (R) | | | | | |
- (10)
- 1.4.2 On the same set of axes, use the information in the table to plot the points showing the graphs of the above-mentioned. Join the points plotted.
- Label the axes as follows:
- X-axis: Amount withdrawn
(1 cm) (or unit) = R100
- Y-axis: Fees charged
(1 cm) (or unit) = R1,00 (4)
- 1.4.3 What advice will you give to a client of the bank as to which account, Bronze or Silver, is the better option to choose? Give a reason for your answer (justify your answer). (2)

2.2.3 Use your ruler to measure the shortest (as the crow flies) distance in millimetres between Calvinia (zone 3) and Carnarvon (zone 5) on the map. (2)

2.2.4 Use the distance calculated in QUESTION 2.2.3 to determine the actual distance in kilometres. (2)

On some maps, we also write the distances, by road, between bigger towns on the map.

2.2.5 Use the distances marked on the map to find the shortest distance, by road, between Calvinia and Carnarvon. (2)

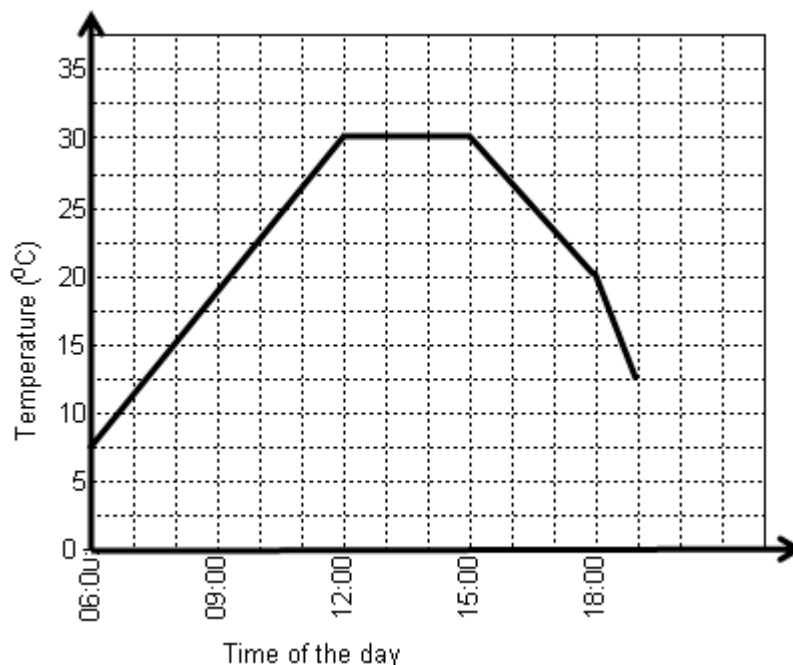
2.2.6 Were the distances the same as the distances you calculated in QUESTION 2.2.4? Explain your answer. (2)

2.2.7 Use the given scale to estimate the distance, by road, between Fraserburg (zone 4) and Bonekraal (in kilometres). (1)

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QUESTION 3

3.1 The graph below shows the change in temperature recorded during spring. The temperatures were recorded between 06:00 and 19:00.



Answer the following questions by using the graph.

3.1.1 At what time of the day did the temperature reach 7,5 °C? (1)

- 3.1.2 What was the temperature reading at 09:00? (1)
- 3.1.3 At what time(s) did the temperature reach maximum and minimum levels? (3)
- 3.1.4 Describe the change in temperature for the following periods:
- (a) 06:00 to 12:00 in the morning (2)
- (b) 12:00 and 15:00 in the afternoon (2)
- (c) 16:00 and 19:00 (2)

- 3.2 Having settled in his two-bedroom flat in the Northern Cape, André was watching the weather forecast on television. He wondered how accurate these forecasts were.

The following map shows the chance of rainfall over South Africa for a particular day. Predicting the weather is very difficult and people who study the weather are never sure what will happen the next day.



Province	Rainfall %
Free State	20%
Limpopo	40%
Western Cape	25%

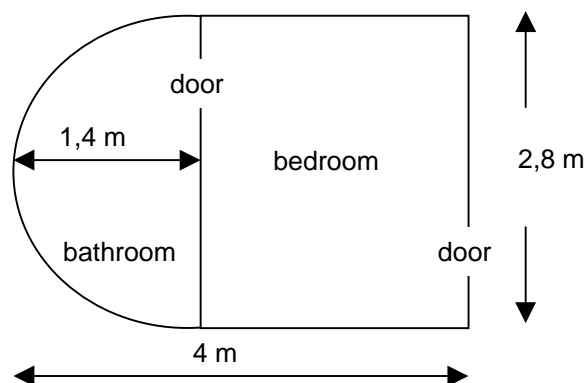
- 3.2.1 Which province is more likely to get rainfall the next day? (2)
- 3.2.2 What do you think the chances of rain are over those parts not marked with a cloud? (2)
- 3.2.3 A friend tells you that there is a one in five chance of rain over the Free State the following day. Is this the same prediction as shown on the map? Explain your answer. (3)
- 3.2.4 What is the chance of rain in the Limpopo Province? Write your answer as a fraction. (2)

- 3.2.5 The chance of rain in Limpopo increases by 10% from the previous day's forecast. What will the new forecast for the following day be? (2)
- 3.2.6 In the Free State the forecast for rain is given as 20%. There was a 100% increase in the prediction for rain from the previous day. Calculate the prediction for rain for the previous day. Show ALL the calculations. (3)
[25]

QUESTION 4

André decided to renovate his flat. The bedroom and adjoining bathroom needed tiling. Since André had just started his new job and his finances were low, his father offered to pay for the renovations.

The following is a two-dimensional sketch of the rectangular bedroom in his flat, which has a semi-circular bathroom with a radius of 1,4 m.



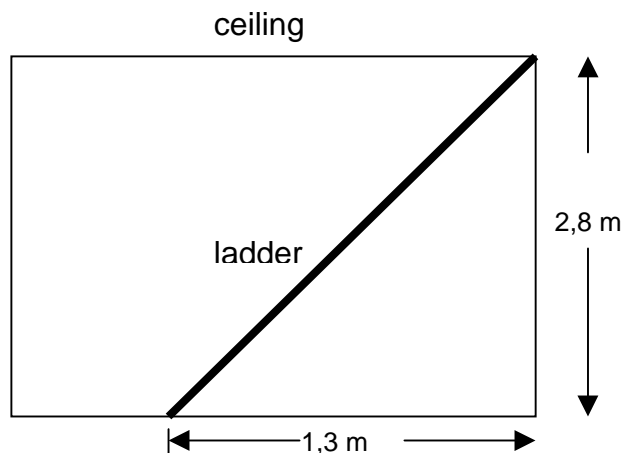
- 4.1 Calculate the dimensions (length and breadth) of the bedroom. (2)
- 4.2 Determine the following areas that André is going to tile:
- 4.2.1 The bedroom (rectangle) (3)
- 4.2.2 The bathroom (semi-circle) (3)
- 4.2.3 The total area (3)
- 4.3 If the dimensions of a tile are 0,4 x 0,4 m, what is the minimum number of tiles that André will need in order to tile the bedroom and bathroom? (4)
- 4.4 Tiles come in boxes of 12. How many boxes should he buy to have enough tiles? (2)
- 4.5 Calculate the cost of the tiles if each tile costs R11,50, excluding VAT. (2)

4.6 What extra amount will he pay for VAT if the rate is 14%? (2)

4.7 André wants to paste one strip of wallpaper all along the circular (curved) wall of the bathroom. How many metres of wallpaper are needed? (3)
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QUESTION 5

5.1 André is experiencing some problems with the geyser in his flat. He needs to use the trap door to get into the ceiling to check on the geyser. He places a ladder 1,3 m away from the wall to reach the ceiling as shown in the sketch.



Determine the length of the ladder he has to use. Round off your answer to the nearest decimal. (5)

5.2 The table below shows the cost of tiles.

Number of tiles	10	35		56		100
Cost of tiles (R)	115		460		920	

5.2.1 Complete ALL the outstanding values in the table. (5)

Use the table to determine the following:

5.2.2 The cost of 20 tiles (2)

5.2.3 The approximate number of tiles that can be purchased for R800 (2)

5.3 André has a view of his neighbour's circular pool from his bedroom window. The pool has a diameter of 520 cm and it is 200 cm deep.

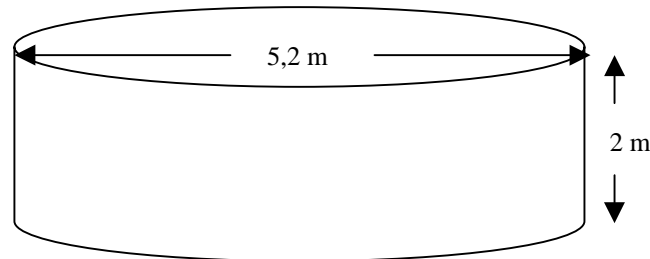
5.3.1 Calculate the total volume (capacity) of the pool in litres (remember 1 litre = 1 000 cm³) (4)

5.3.2 Only 80% of the pool is filled. How many litres of water were

used?

(2)

- 5.3.3 The inlet pipe to the pool fills the pool at a rate of 30 litres per minute. Determine how long it will take to fill the pool to the required level.

(2)
[22]**QUESTION 6**

Paul reads in the newspaper that a recent study in the United States has revealed that 37% of the people in America are overweight and that 22% are obese. Furthermore, 15,5% of all teenagers in America are obese.

This gets him thinking about the situation at his school and in the rest of South Africa and how it compares with the situation in America.

To determine your weight status according to the classification given below, you have to determine your Body Mass Index (BMI) using the following formula:

$$\text{BMI} = \frac{\text{Weight in kg}}{(\text{Height in m})^2}$$

The BMI is then used to classify someone as follows:

BMI	Classification
< 18,5	Underweight
≥ 18,5 and < 25	Normal weight
≥ 25 and < 30	Overweight
≥ 30	Obese

- 6.1 Calculate Paul's BMI if he weighs 85 kg and his height is 1,75 m. (2)
- 6.2 Using the table above based on BMI, how would you classify Paul's BMI? (2)

- 6.3 Making use of the questionnaire, Paul gathers the following information from the learners in his class, which he arranges in the form of the table shown below:

Number	Height (m)	weight (kg)	BMI
1	1,71	88	30,1
2	1,80	91	28,1
3	1,76	82	26,5
4	1,64	70	26,0
5	1,65	69	25,3
6	1,50	54	24,0
7	1,75	72	23,5
8	1,66	63	22,9
9	1,70	65	22,5
10	1,64	58	21,6
11	1,71	63	21,5
12	1,52	48	20,8
13	1,65	55	20,2
14	1,68	56	19,8
15	1,60	47	18,4
			407

Use the data on BMI in the table above to determine the following for the learners in his class:

- 6.3.1 The mean (3)
- 6.3.2 The median (3)
- 6.3.4 Which indicator, the mean or median, best illustrates the average BMI of the learners in Paul's class? Give a reason for your answer. (2)

- 6.4 Paul decides to turn the table on the previous page into a more manageable form by compiling a frequency table.

FREQUENCY TABLE OF LEARNERS ACCORDING TO BMI

CLASSIFICATION	TALLY	NUMBER OF LEARNERS (FREQUENCY)
Underweight (<18,5)		
Normal weight ($\geq 18,5$ and < 25)		
Overweight (≥ 25 and < 30)		
Obese (≥ 30)		

- 6.4.1 Copy the frequency table above into your answer book. Now complete the frequency table. (6)
- 6.4.2 What percentage of Paul's class is (to the nearest whole number):
- (a) Underweight (1)
 - (b) Normal weight (1)
 - (c) Overweight (1)
 - (d) Obese (1)
- 6.4.3 How do the statistics for Paul's class, in terms of obesity, compare with the statistics for American teenagers? (2)
- 6.4.4 Can you think of a possible reason that would explain the difference? (1)
- 6.5 Construct a pie chart, showing the percentage of learners in Paul's class who are underweight, normal weight, overweight and obese. (Estimate the sizes of the angles.) (4)

[29]

TOTAL: 150