



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2008

MATHEMATICAL LITERACY: PAPER I

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. The question paper consists of:
 - A question paper of 15 pages
 - Appendix A – Graph Paper
 - Appendix B – Map to 'Gold Reef City Theme Park'

Detach the appendix sheets from the centre of the question paper. Please check that your paper is complete.

2. Answer ALL the questions.
 3. Number your answers clearly and exactly as the questions are numbered in the question paper.
 4. You may use an approved non-programmable calculator.
 5. Answers must be rounded off to two decimal digits, unless otherwise stated.
 6. It is in your own interest to **show all** working details, to write legibly and to present your work neatly.
 7. Not all diagrams are drawn to scale.
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QUESTION 1

1.1 Calculate, **showing all steps**, the following:

1.1.1 $24 + 7 \times 2 - 6$ (2)

1.1.2 $\frac{3}{4}(7 - 2) + 6$ (2)

1.1.3 $\frac{4}{5}$ of 6 800 (2)

1.2 A jogger jogged at a rate of 135 metres per minute. How far, in kilometres, did he jog in 15 minutes? (3)

1.3 After six Mathematics tests, Gugu's mean score was 71. She hopes to raise her mean score to 75 after the next test.

What score will she need to achieve in her seventh test to obtain a mean mark of 75, if all the tests carry the same weighting? (3)

1.4 Sybil needs the following ingredients to bake her favourite surprise pie:

$1\frac{1}{2}$ oz of butter
$1\frac{1}{2}$ pints of milk
$\frac{3}{4}$ lb flour

The oven also needs to be set at 350° F to bake the pie.

1.4.1 Convert $1\frac{1}{2}$ oz to grams. (1 oz = 30 g) (2)

1.4.2 Convert $1\frac{1}{2}$ pints to millilitres. (1 pint = 560 ml) (2)

1.4.3 Convert $\frac{3}{4}$ lb to grams. (1 lb = 450 g) (2)

1.4.4 Convert 350° F to degrees Celsius (°C) by using the following formula:

$$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$$
 (3)

- 1.5 The Silver Bolt Company can pack 24 large bolts in a box. One box was only 75% full. How many bolts were in this box? (2)
- 1.6 Mr Turner worked for 40 hours. He was paid R65,25 per hour, and he received a bonus. If he received a total of R5 613, how much was his bonus? (3)
- 1.7 The Selebi family decided to travel 480 km on the first day of their holiday. They drove for 3,5 hours at a speed of 120 km/h. How much further did they have to travel? (3)
- 1.8 A chemist needs to make a 120 ml mixture made up of ingredient A and ingredient B. The ratio of A : B = 2 : 4. Calculate, in millilitres, the quantity of each ingredient the chemist will need. (3)

32 marks

QUESTION 2

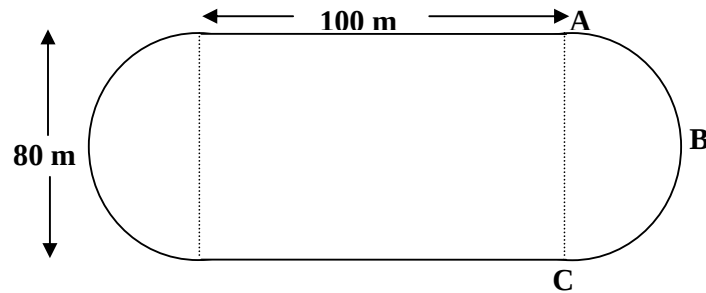
- 2.1 To get to work daily, Mr Smith uses the Gautrain from Park Station to Sandton City. Mr Smith works on average 25 days a month and pays R8,45 per one way trip daily.
- 2.1.1 What will Mr Smith's average monthly cost be for a daily return trip from Park Station to Sandton City? (3)
- 2.1.2 Parking at Park Station will cost you R25,00 per day. What is the total amount that Mr Smith will need to budget monthly for parking? (2)
- 2.1.3 It is predicted that the usage of the Gautrain will increase from 100 000 to 120 000 by 2015. What is the percentage increase in commuters using the Gautrain? (3)
- 2.2 An insurance company uses the following formula to calculate the amount it will pay for repairs to an insured house:

$$\text{amount paid for repairs} = \frac{\text{cost of repairs} \times \text{insured value}}{\text{market price} \times 0,8}$$

Steve's house was severely damaged by fire and the cost of repairs was R110 000. The insured value of the house was R1 500 000 and the market price was R2 100 000.

How much did the insurance company pay for the repairs? (3)

- 2.3 The athletics track shown below consists of two straight sides and two semi-circles on either end of the track.



$$\text{Area of circle} = \pi r^2$$

$$\text{Circumference of circle} = 2 \pi r$$

$$\text{Area of rectangle} = \ell \times b$$

$$r = \text{radius} \quad \ell = \text{length} \quad b = \text{breadth}$$

$$\text{use } \pi = 3,14$$

- 2.3.1 Determine the area of the field inside the track. (3)
- 2.3.2 Determine the cost of covering $12\,500 \text{ m}^2$ of the track with grass, if grass costs R83 per 2 m^2 . (3)
- 2.3.3 The right bend marked A to B to C of the track is to be fenced with wire, with supporting poles 3 m apart. Calculate how many poles will be needed. (5)

22 marks

QUESTION 3

- 3.1 The extract below is from a page in a catalogue used by a cricket coach to order cricket equipment for the next cricket season.

 Helmet R349,00 Code: H 911	 Gloves R89,99 per pair Code: G 456	
 Box of 4 Cricket balls @ R165 Code: B 99	 Cricket Pads R129,99 per pair Code: CP 836	Cricket Bat Size 3 R549,00 Code: CB 231 Cricket Bat Size 5 R749,00 Code: CB 897

The coach needs to complete the order form as shown below:

CRICKET WHOLESALE SUPPLIERS ORDER FORM				
Description	Catalogue Number	Quantity	Price Each	Total Price
Cricket bats	CB 231	5		
Gloves per pair	G 456	11		
Helmets	H 911	3		
Cricket pads	CP 836	3		
Cricket balls in boxes of 4	B 99			
Amount to be paid on delivery of items			Total for items ordered	
			VAT @ 14%	
			Handling Charge	
			Total	

3.1.1 The cricket coach needs 12 balls in total for the cricket practices.

- (a) How many boxes of 4 balls would he need to purchase? (2)
 (b) What is the total cost of the balls? (2)

3.1.2 What is the total price for all the items ordered on the order form? (5)

3.1.3 Determine the amount of Value Added Tax at 14% (VAT) that will be charged for the total order. (2)

3.1.4 Delivery charges are calculated according to the number of items ordered:

Number of items ordered	Cost
< 10	R150
Between 10 and 20	R100
> 20	R50

What would the delivery charge be on this order? (2)

3.1.5 What is the total amount due on delivery of this order? (2)

3.1.6 The annual budget for cricket at this school is R12 500. What percentage of the budget was spent on cricket equipment for the season? (2)

3.2 Two manufacturing companies, A and B, supply two types of cricket bats, X and Y to various schools.

In the tables below, the cost of an equal number of bat X and bat Y is shown.

Manufacturer A charges R500 to make bat X and R240 to make bat Y.

Table 1

Manufacturer A						
Number of cricket bats	0	2	4	6	8	10
Cost of bats	0	740	(a)	2 220	2 960	3 700

Manufacturer B charges R300 to make bat X and R330 to make bat Y.

Table 2

Manufacturer B						
Number of cricket bats	0	2	4	6	8	10
Cost of bats	0	630	1 260	1 890	(b)	3 150

3.2.1 Determine the values for:

- (a) in **Table 1** (2)
(b) in **Table 2** (2)

3.2.2 The school has allocated the coach only R3 810 to purchase all new bats. He has decided to purchase 5 type X bats and some type Y bats.

Use the following formula to determine the number of type Y bats he can purchase.

$$\text{Allocated amount if the bats are purchased from manufacturer B} \\ = \text{R}300 \times (\text{number of type X bats}) + \text{R}330 \times (\text{number of type Y bats}) \quad (3)$$

3.2.3 Use the graph paper, which is supplied in Appendix A, to draw the following graphs:

- A line graph, which uses the data in Table 1. Label the graph clearly.
- A line graph, which uses the data in Table 2. Label the graph clearly. (7)

3.3 After a successful cricket season, the coach decides to spoil the team with a visit to 'Gold Reef City Theme Park'. The map to the theme park is included in Appendix B.

Use the map to answer the following questions:

3.3.1 If the bus driver is travelling from Booyens and missed the turn-off to the theme park, which suburb would he pass next if he continues on the highway in a southerly direction? (1)

3.3.2 The bus driver thinks about exiting the highway at the next turn-off, Xavier Street at Robertsham Ext. 1. It is approximately 100 mm on the map back to the theme park. Use the scale of 1 : 8 500 to determine the distance in kilometres. (3)

35 marks

QUESTION 4

The following is an extract from a Loan Repayment Schedule, for a fixed term personal loan from ABC Loans.

Amount borrowed	Monthly repayment options		
	12 months	24 months	36 months
R7 000	R663	R405	R243
R6 000	R556	R305	R223
R5 000	R463	R254	R186
R4 000	R371	R204	R149
R3 000	R278	R153	R111
R2 000	R185	R102	R74
R1 000	R93	R51	R37

A Fixed Term Personal Loan gives you:

- A choice of 12, 24 or 36 months repayment periods each time you borrow, at an annual simple interest rate of 29%.
- Fixed repayments so you can plan and budget accordingly.
- The opportunity to re-apply once your loan is settled.

Mr Sithebe takes a loan for R6 000. He intends to repay the loan over 2 years.

- 4.1 How much will he pay monthly? (1)
- 4.2 What is the total of Mr Sithebe's repayment for the two years? (2)
- 4.3 Determine the amount of interest Mr Sithebe will pay on his loan. (2)
- 4.4 Mr Sithebe approached 'XYZ Loans' who also offered to loan him R6 000. The loan is lent out at 29% simple interest, for a period of 2 years.

The following formula can be used: $S.I. = P \times n \times i$

Where $S.I.$ = Simple interest
 P = Principal amount
 n = Time period
 i = Interest rate

- 4.4.1 Calculate the amount of interest he will pay on the loan if he takes a loan through 'XYZ Loans'. (3)
- 4.4.2 Which loan company should Mr Sithebe consider using for his R6 000 loan? (1)

4.5 Mr Sithebe sees two advertisements for plots of land at a seaside resort.

LAND SALE!
640 m² Plot with sea view

R140 000

GOING CHEAP!
Owner selling undeveloped
plot, 1 000 m²

R234 000

What is the difference in price, per square metre, between the two plots of land? (5)

14 marks

QUESTION 5

In this question the following formulae can be used:

$$\text{Area of rectangle} = \ell \times b$$

$$\text{Total surface area of rectangular prism} = 2 \times [\ell \times b + \ell \times h + h \times b]$$

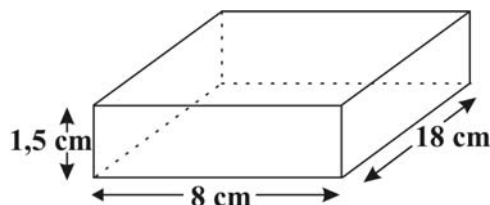
$$\text{Volume of rectangular prism} = \ell \times b \times h$$

Where ℓ = length

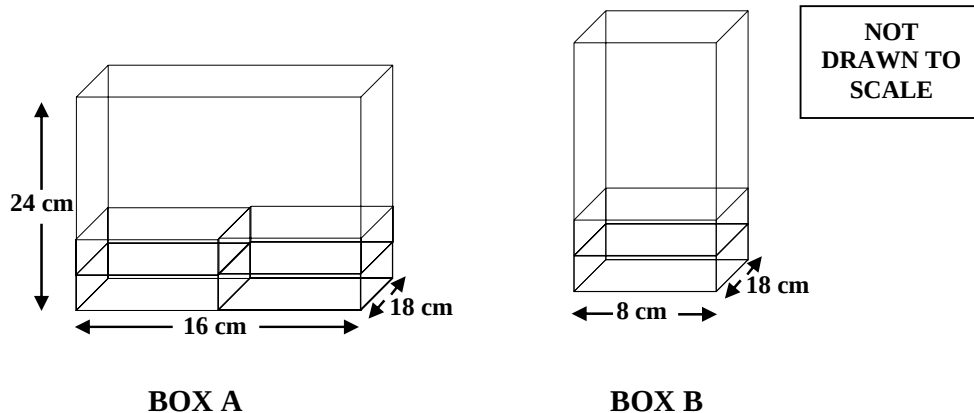
b = breadth

h = height

The 'Nutz Choc' chocolate slabs are in the shape of a rectangular prism. The dimensions of the chocolate slabs are shown in the diagram below.



These chocolate slabs can be packed in Box A or Box B. The same number of slabs can fit in each box.

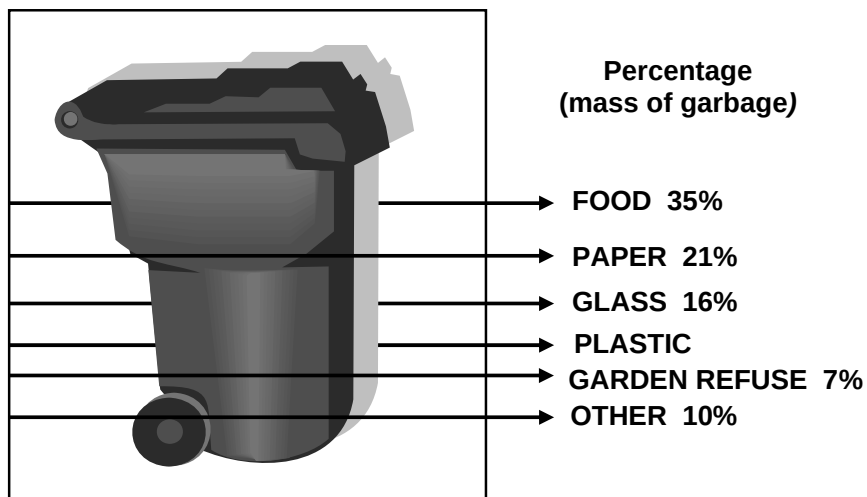


- 5.1 Calculate the number of slabs that would fit in each box. (3)
- 5.2 Determine the height of Box B. (2)
- 5.3 Determine the total surface area of Box B. (3)
- 5.4 If it costs R32,60 to make 4 slabs of chocolate, how much would it cost to fill box A with slabs of chocolate? (4)

12 marks

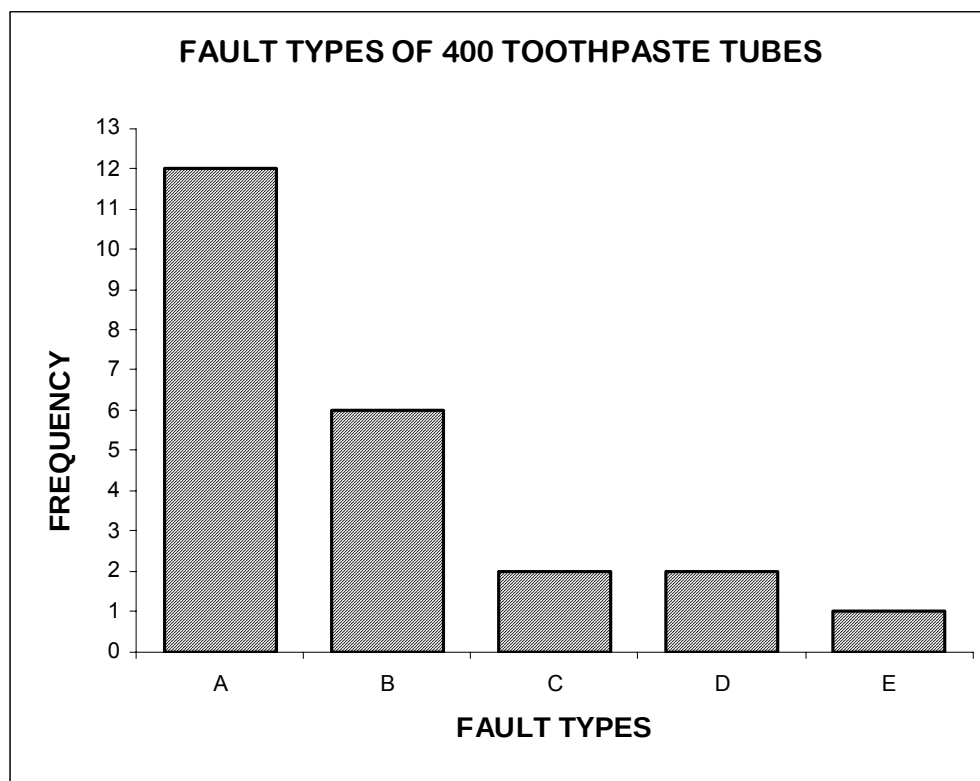
QUESTION 6

- 6.1 The diagram below represents the percentage composition of the garbage disposed of by the Smith family in a week. The average full garbage bin has a mass of 35 kg, which excludes the mass of the bin.



- 6.1.1 Calculate the percentage of plastic waste that is disposed by the Smith family per week. (2)
- 6.1.2 Calculate the mass of food in kilograms that the Smith family wastes per week. (2)
- 6.1.3 The local municipality will recycle glass and paper. Determine the mass of the remaining garbage. (3)

- 6.2 Mrs Smith, a quality controller for a toothpaste manufacturer, inspected 400 tubes of toothpaste. The number of faults of different types is recorded in the graph below.

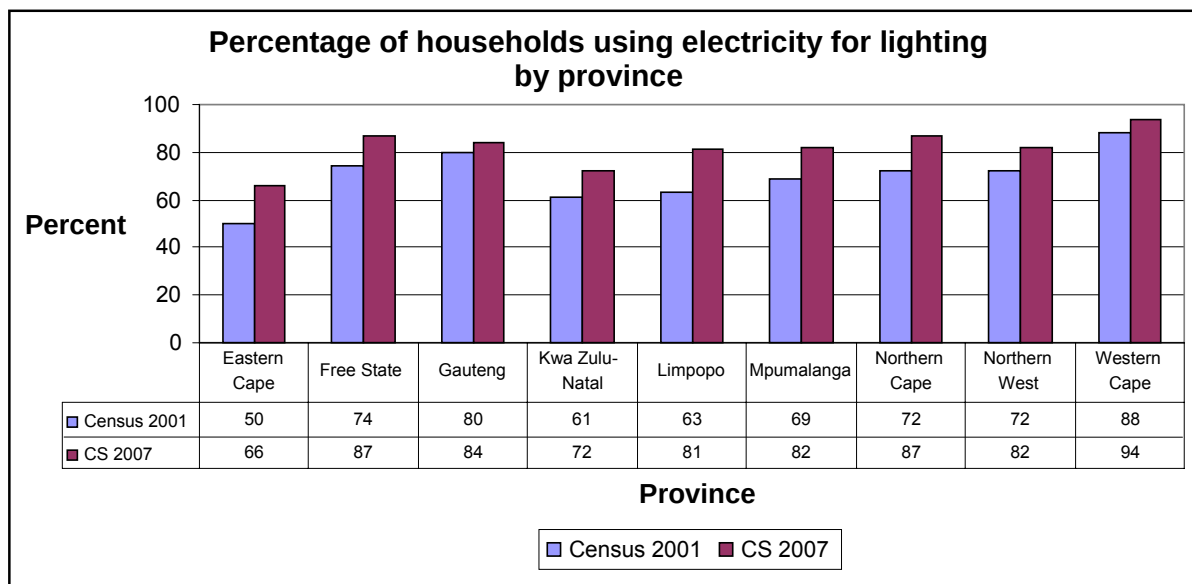


- 6.2.1 What was the total number of faults found in the 400 tubes of toothpaste? (2)
- 6.2.2 The company wants to improve its product by reducing the number of faulty tubes it makes. Which one of the fault types should be fixed to give the greatest improvement? (1)
- 6.2.3 A tube of toothpaste is chosen at random from the sample of 400. What is the probability that the following will be chosen?
- (a) Type B fault. (2)
 - (b) No fault. (2)

14 marks

QUESTION 7

In February 2007, a large scale Community Survey (CS) was conducted in all provinces. The main objective of the survey was to provide demographic and socio-economic data at municipal level. A total of 949 105 people were questioned and 246 618 households were covered during the survey.



[Source: <www.statssa.gov.za>]

- 7.1 Which province showed the highest use of electricity for lighting purposes in the Community Survey 2007? (2)
- 7.2 Which province showed the lowest growth in electricity usage from the 2001 Census to the 2007 Community Survey? (2)
- 7.3 Determine:
- 7.3.1 The average electricity usage for South Africa for 2001. (4)
- 7.3.2 The average electricity usage for South Africa for 2007. (4)
- 7.3.3 The average percentage growth in electricity usage for lighting from 2001 to 2007. (2)

- 7.4 Sipho and Jane were discussing ways of reducing their parents' electricity accounts. Both their houses have ten 60-watt light bulbs which are used for 6 hours a day.

The following table details the average cost of electricity consumed by two types of light bulbs.

Light bulbs	Cost per hour (cents)
60 watt	2,66
40 watt	1,78

Determine, showing all necessary working out, which of the two options below will be the better option to choose.

- **Sipho's Option:**
Changing all ten light bulbs to 40-watt light bulbs.
- **Jane's Option:**
Keeping the 60-watt light bulbs and reducing the number of these bulbs used to 7, and changing the remaining 3 light bulbs to 40 watt. (7)

21 marks

Total: 150 marks