education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

EXEMPLAR 2008

MARKS: 150

TIME: 3 hours

This question paper consists of 15 pages and 3 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SEVEN questions. Answer all the questions.

2. QUESTIONS 2.2.2 and 3.4 must be answered on the attached annexures. Write your name/examination number in the space provided and hand in the 3 annexure sheets with your ANSWER BOOK.

3. Number the questions correctly according to the numbering system used in this question paper.

4. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

5. ALL the calculations and steps must be shown clearly.

6. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.

7. Start each question on a NEW page.

8. Write neatly and legibly.

QUESTION 1

In order to earn pocket money, Andile helps her father in his computer business every Saturday for six hours. She starts work at 07**:**30 and her father agrees to give her R8,50 per hour.

Andile saves some of her earnings each Saturday for special occasions.

For her first special occasion, she is planning to take a group of four friends on an outing to the movies. Her budget for the first special occasion is listed below:

The cost of 5 return bus tickets to the movies is R55,00.
The cost of 5 movie tickets is R150,00.
The cost of 4 small snack packs and 1 large snack pack is R138,00.

1.1. At what time does she finish work? (2)

1.2 How much does she earn each Saturday? (2)

1.3 Calculate the total budgeted cost of the outing. (2)

1.4 What is the cost per person of a return bus ticket? (2)

1.5 One of Andile's friends has a movie membership card which allows her to receive a 10 % discount for each ticket.

What amount will she save on the cost of the movie tickets, if she uses this card to buy the tickets? (2)

1.6 What amount would she save on transport costs if her father offers to drive them back home after the movies? (2)

1.7 The cost of one small snack packs is R27,00. Calculate the cost of a large snack pack. (3)

1.8 A large snack pack consists of a choice of sweets (either Tumbles or Whispers or Smarties), 1 large box of popcorn, and a choice of soft drink (either Fanta or Coke).

What is the probability of Andile choosing:

1.8.1 Smarties as one of the sweets? (2)

1.8.2 a milkshake as a choice of drink? (2)
[19]

QUESTION 2

Shana and Kabelo, from a rural school near Dendron in Limpopo, decided to get involved in the Lighthouse Foundation community project in their town. They would like to assist with the packing of the food parcels and to visit the children to help them with their schoolwork.

Shana's aunt is the coordinator of The Lighthouse Foundation and each year she presents a financial report (as shown in TABLE 1) to all the stakeholders.

TABLE 1: Lighthouse Foundation Financial Report for 1 March 2006 – 28 February 2007

INCOME		**EXPENSES**	
Item	**Amount (in Rand)**	**Item**	**Amount (in Rand)**
Private donations : local	78 240	**Administration Costs:**	
overseas	57 120	Salaries for part-time employees	128 833
Subsidy from the local municipality	308 160	Telephone	15 571
		Stationery/postage	2 379
		Bank charges	2 899
		Services rendered to children:	
		Food parcels	178 200
		Vegetable gardens (seedlings, fertiliser, etc.)	5 812
		School uniforms	10 047
		Clothing	30 456
		Transport costs	22 822
TOTAL	**443 520**	**TOTAL**	

2.1 Use the information in TABLE 1 to answer the following questions:

2.1.1 Write down the time period that the financial report covered. (1)

2.1.2 Name the main source of income. (1)

2.1.3 Calculate the average cost of one school uniform if 48 children received uniforms? (3)

2.1.4 The overseas donations are from businessmen in Europe. Use the exchange rate table below to determine the amount in euros that the Foundation received from the overseas donors.

EXCHANGE RATES
1 pound (£) = 14,52 South African rand (R)
euro (€) = 9,52 South African rand (R)
1 american dollar ($) = 7,02 South African rand (R)

(3)

2.1.5 Express the subsidy from the local municipality as a percentage of the total income. Give the answer rounded off to the first decimal place. (4)

2.1.6 The Foundation uses a vehicle to deliver the food parcels and for transporting the children. Transport costs for the period of the report were R22 822.

(a) Give an example of one type of transport cost. (1)

(b) Calculate the cost per kilometre if 18 554 km were covered during that year. (3)

2.2 There were 1 712 children who benefited from this project during the period of the report.

These children are divided into four different categories and TABLE 2 below (which is repeated on ANNEXURE A) shows the distribution.

TABLE 2: Lighthouse Foundation Beneficiaries for the Period 1 March 2006 – 28 February 2007

Category		Number
A	Children with terminally ill parents	13%
B	Children without parents and living with relatives	48%
C	Children in child-headed households	29%
D	Children who are living in foster homes	10%

2.2.1 Calculate exactly how many children without parents and living with relatives benefited from the project. (3)

2.2.2 Use the grid provided on ANNEXURE A to represent the data in TABLE 2 as a bar graph. (5)

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QUESTION 3

The matriculants of Malendela High are planning a Matric Farewell Function. They have a choice between their school hall or the Central Hotel as a venue.

If their school hall is used, the caterers will provide the food and table decorations as well as providing the music, at a cost of R110 per person.

The Central Hotel quotes them a basic cost of R2 400 which covers the cost of the music and decorations. An additional charge of R50 per person for food will be levied.

The learners calculated the total cost for varying numbers of tickets to be sold. The following two tables represent the total cost for these two options.

TABLE 3: Cost of using the school hall

No of tickets	0	10	25	40	80	100
Cost in Rand	0	1 100	2 750	4 400	8 800	11 000

TABLE 4: Cost of using the Central Hotel

No of tickets	0	10	20	40	50	100
Cost in Rand	2 400	2 900	3 400	4 400	4 900	7 400

3.1 Determine:

3.1.1 the number of tickets sold if the total cost of using the Central Hotel is R3 400. (1)

3.1.2 the total cost if 50 tickets are sold for the function in their school hall. (3)

3.2 Write down the number of tickets sold if the cost for the two venues is the same and also give the corresponding cost. (3)

3.3 The total cost of hiring the Central Hotel is given by the formula:

Total Cost = R 2 400 + (number of tickets) $\times$ R50

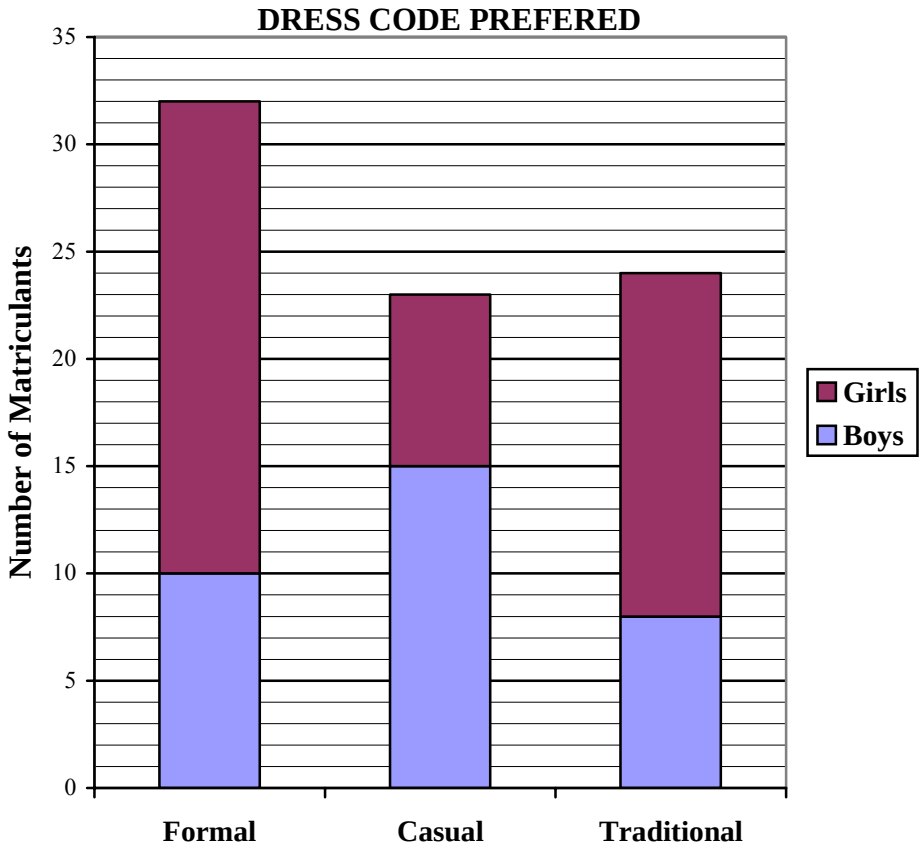
3.3.1 Calculate the total cost for 47 tickets. (2)

3.3.2 Calculate the number of tickets if the cost is R7 500 (3)

3.4 Draw two line graphs on the grid provided on ANNEXURE B by using the data in TABLE 3 and TABLE 4. Clearly label the two graphs. (8)

3.5 The matriculants also need to decide on the dress code for the function. They conducted a survey amongst themselves to find out which is the preferred dress code.

The results of the survey were illustrated as a compound bar graph which is shown below



3.5.1 Which dress code was found to be the least popular:

(a) amongst the boys? (1)

(b) overall? (1)

3.5.2 Which dress code did most of the girls prefer? (1)

3.5.3 How many boys preferred traditional dress? (1)

3.5.4 How many girls chose casual dress as their preferred dress code? (2)

3.5.5 Calculate how many matriculants responded to the survey? (3)

3.5.6 Which dress code do you think is the one the matriculants eventually chose? (1)

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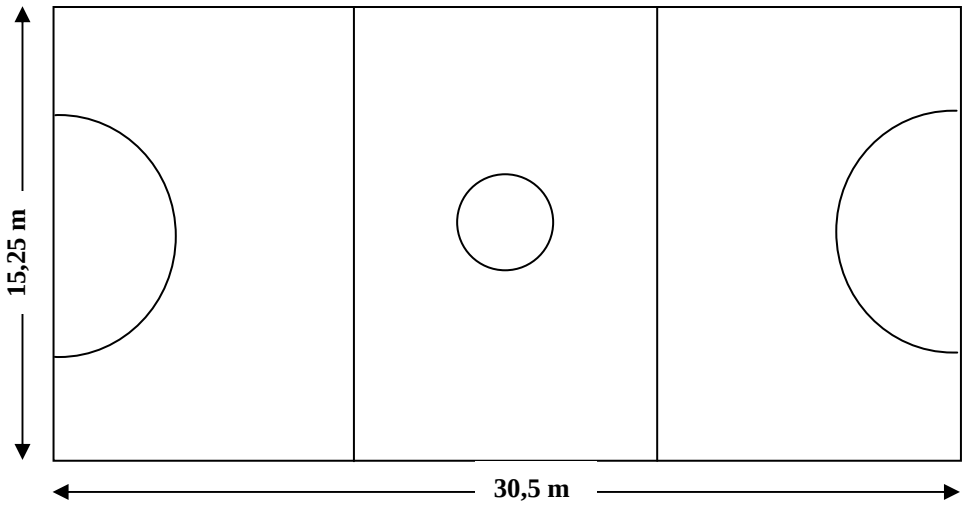
QUESTION 4

Netball is a game played between two teams with seven players on each team. The netball court is divided into three equal sections with a centre starting circle and two semi-circles marking out the goal shooting areas at each end.

The following drawing is a layout of the plan of the rectangular netball court. The measurements on the diagram (not drawn to scale) are given in metres.



Diameter of the goal shooting area = 9,8 m
Diameter of the centre starting circle = 0,9 m

Star High School decides that they want to build a grass netball court at their school and contracted Netball Incorporated to build the court.

Netball Incorporated plans to lay instant lawn on the surface of the court. Instant lawn comes in rectangles of already planted grass with a length of 1m and a breadth of 500 mm.

In this question the following could be used: **Area of rectangle = Length × Breadth**

4.1 Netball Incorporated needs to determine how many grass rectangles are required.

4.1.1 Calculate the area of the netball court. (2)

4.1.2 Convert 500 mm to metres. (1)

4.1.3 Calculate the area of one grass rectangle in m^2. (2)

4.1.4 How many rectangles of grass are needed to cover the court? (3)

4.2 If it takes 4 workers 5 hours to complete the laying of the grass rectangles, how many workers would be needed to complete the task in half the time? (2)

4.3 Netball Incorporated will supply the goal nets for the netball court and will also provide one spare net. The cost per goal net is R24,80.

4.3.1 How many goal nets will they supply? (1)

4.3.2 What will the total cost be of the goal nets? (2)

4.4 Netball Incorporated will also paint lines on the netball court using grass paint which is available in 1ℓ, 2ℓ and 5ℓ tins.

A 1ℓ tin of grass paint covers a surface area of 1,5 m^2 and a 2ℓ tin of grass paint covers a surface area of 3m^2.

Calculate surface area that 5ℓ of grass paint can cover. (2)

4.5 An amount of R11 000 was needed to build the netball court. The school had to take a loan from the local bank at a simple interest rate of 17% per annum. The bank and the school agreed that the loan would be repaid over a period of five years.

Calculate the amount of interest that the school would have to pay on the loan, using the formula: S.I. = $P \times n \times i$ where S.I = simple interest
P = the initial amount
n = time period
i = the interest rate (3)
[18]

QUESTION 5

Mrs Lurie attended a conference in South Africa on the recycling of waste material. She presented a paper at the conference on the recycling of waste material in Australia and used the following table:

TABLE 5: Recycling of waste material in Australia

Types of waste	Number of households that recycled waste material	Methods of recycling		
		Re-used at home	Sent to a central collection point *	Sent to a waste transfer centre **
Plastic bottles	592 000	7%	30%	63%
Aluminium cans	548 000	1%	39%	60%
Motor oil	62 000	17%	25%	58%
Paper/Cardboard	564 000	15%	6%	79%
Plastic bags	572 000	88%	9%	3%
Glass	581 000	17%	17%	66%

* given to individuals or organisations for re-use
** taken back to industry for recycling
Reference: www.abs.gov.au

5.1 Of the various types of waste, which one was:

5.1.1 mostly re-used at home? (1)

5.1.2 mostly sent to a central collection point? (1)

5.2 If the total number of households in Australia during 2006 was 640 500, what percentage of the households recycled glass? Give your answer rounded off to one decimal place. (4)

5.3 Research has shown that the recycling of one aluminium can is equivalent to the saving of sufficient energy for a television set to play for three hours.

Determine the equivalent energy saving that can be obtained by the recycling of 20 aluminium cans. (2)

5.4 Mrs Lurie also used pie charts to illustrate the data in TABLE 5. Two of the pie charts are shown below.

Chart A

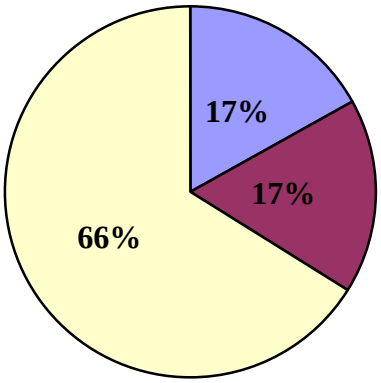
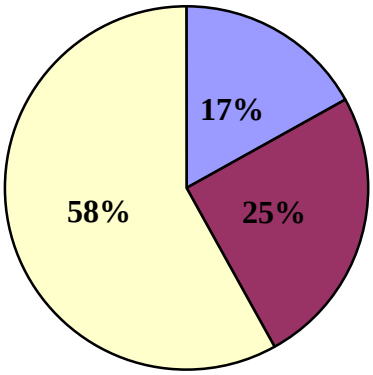


Chart B



5.4.1 Which chart illustrates the recycling of glass? (2)

5.4.2 Which type of waste material is illustrated by the other chart? (2)

5.5 Mrs Lurie emphasised at the conference that the recycling of paper contributes to the conservation of trees which are essential to remove carbon dioxide from the atmosphere. A South African delegate at the conference stated that in South Africa 2 144 000 tons of paper were used during 2005 and that 935 000 tons of this paper were recycled.

5.5.1 Write down the ratio of the mass of paper recycled as a ratio of the total mass of paper consumed in South Africa. Give the ratio in simplified form. (2)

5.5.2 Research has shown that each ton of recycled paper is equivalent to the paper produced from 17 trees.

How many trees were saved by the recycling of paper in South Africa during 2005? (2)

5.5.3 Research has also shown that on average, South Africans annually recycle 43% of the paper used.

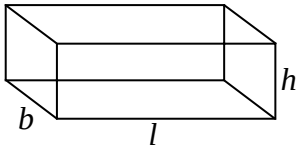
Suppose 2 144 000 tons of paper would be used in the year 2010.

Predict, by means of calculation, the number of tons of paper that would be recycled. (2)

[18]

QUESTION 6

Most people in the Umgeni River catchment area, have no direct access to potable (drinking) water. In order to assist with this problem, it was decided by the district authorities that every household should be supplied with a rectangular stainless steel tank with a volume of 2 000 000 cm^3 in which to catch rain water.



The following table shows different types of tanks each one having a volume of 2 000 000 cm^3.

TABLE 6: Different types of 2 000 000 cm^3 tanks

Tank Type	Length in cm	Breadth in cm	Height in cm	Surface Area in cm^2
A	160	100	125	97 000
B	128	125	125	95 250
C	200	100	100	100 000
D	200		80	102 000
E	160	156,25	80	

In this question the following could be used:

1 000 cm^3 = 1 000 mℓ = 1ℓ 1 000 ℓ = 1kℓ

Area of rectangle = L × B

Surface Area of a right rectangular prism = 2×(L×B + L×H + B× H)

Volume of a right rectangular prism = L × B × H

where L = length B = breadth and H = height

6.1 What is the volume of the tank in kℓ (1)

6.2 From the table it can be seen that tank B has the smallest surface area. Write down the dimensions of tank B. (1)

6.3 Calculate:

6.3.1 The area of the base of tank A in cm^2. (2)

6.3.2 The total surface area of tank E in cm^2. (3)

6.3.3 The breadth of tank D in cm. (3)

6.3 A supplier is prepared to construct water tanks at the cost of R120 per m^2, which includes Value Added Tax (VAT) of 14%.

6.3.1 Calculate the cost, including VAT, of water tank B. (3)

6.3.2 What would the cost per m^2 be, excluding VAT? (2)

[15]

QUESTION 7

Mr Naidoo has been offered a promotion and has to relocate from Cape Town to Johannesburg. He will be given a substantial increase in salary and in housing benefits.

In order to compare the two climates, Mr Naidoo obtained the following data on rainfall in Cape Town and Johannesburg.

TABLE 7: Rainfall in Cape Town and Johannesburg in 2006

MONTHS	CAPE TOWN			JOHANNESBURG	
	Monthly Rainfall (in mm)	Number of rainy days		Monthly Rainfall (in mm)	Number of rainy days
January	15	6		125	16
February	17	5		90	11
March	20	5		91	12
April	41	8		54	9
May	69	11		13	3
June	93	13		9	2
July	82	12		4	1
August	77	14		6	2
September	40	10		27	4
October	30	9		72	10
November	14	5		117	15
December	17	6		105	15
TOTAL	**515**	**104**		**713**	**100**

http://www.weathersa.co.za

7.1 Answer the following questions.

7.1.1 Which city has the higher annual rainfall? (1)

7.1.2 Calculate the range in the monthly rainfall for Johannesburg. (3)

7.1.3 In South Africa the summer months are November, December and January. Which of the two cities has mainly summer rainfall? (1)

7.1.4 In which month(s) is the rainfall in Cape Town more than 80 mm? (2)

7.1.5 What trend do you see in the monthly rainfall in Johannesburg from January to April? (2)

7.1.6 Calculate the average number of rainy days per month in Cape Town. Give the answer correct to the nearest whole number. (3)

7.2 The family will travel by car from Cape Town to their new home in Johannesburg. A map of South Africa, given in ANNEXURE C, shows the main routes linking different towns and cities in South Africa.

The numbers on the map indicate the route. For example the ⬠1 on the map is the N1 route.

The distance table showing the shortest distance between some of the towns in South Africa is also given in ANNEXURE C

Use the map or the distance table to answer the following questions.

7.2.1 Write down the grid reference for Cape Town. (1)

7.2.2 One of the routes linking Cape Town and Johannesburg is the N1. Name two towns or cities on this route. (2)

7.2.3 In which general direction would the family be travelling from Cape Town to Johannesburg? (1)

7.2.4 The straight line distance between Cape Town and Johannesburg on the map is 80 mm. Use the scale 1 **:** 16 000 000 to write this distance in kilometres. (3)

7.2.5 The family have the option of travelling to Johannesburg via Kimberley or Bloemfontein.

Which routes would they follow to travel via Kimberley? (2)

7.2.6 Give the relative position of Kimberley with respect to Bloemfontein on the map. (1)

7.2.7 The family decide to travel from Cape Town to Johannesburg via Bloemfontein.

(a) Write down the distance between Cape Town and Bloemfontein using the distance table. (1)

(b) The distance table gives the distance between Bloemfontein and Johannesburg as 417 km.
If Mr. Naidoo covered this distance in 4,5 hours, calculate his average speed correct to the nearest whole number using the formula : distance = speed × time

(3)
[26]

TOTAL [150]