



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**SEPTEMBER 2011**

**MATHEMATICAL LITERACY– PAPER 1**

**MARKS: 150**

**TIME: 3 hours**



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This question paper consists of 12 pages and 3-page annexure.

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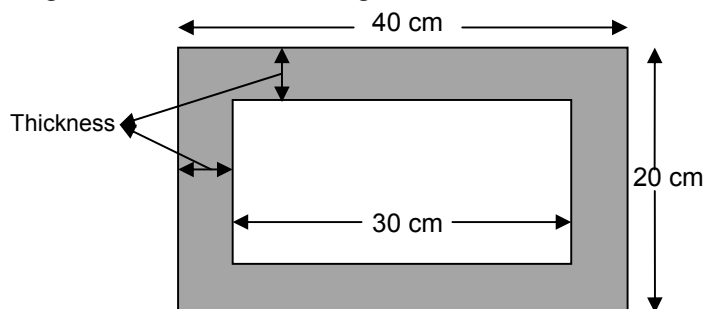
**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of SIX questions. Answer ALL the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. QUESTION 3.2.4 must be answered on ANNEXURE A. QUESTION 6.1.1 must be answered on ANNEXURE B. QUESTION 6.2 should be answered with the help of the map on ANNEXURE C. All ANNEXURES are at the end of this question paper.
4. Write your name/examination number in the spaces provided and hand in the ANNEXURES with the ANSWER BOOK.
5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
6. ALL the calculations and steps must be clearly shown.
7. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise. Do NOT round off until you get to the answer.
8. Start EACH question on a NEW page.
9. Write neatly and legibly.

## QUESTION 1

- 1.1 1.1.1 Write 65% as common fraction in its simplest form. (2)
- 1.1.2 Calculate:  $2,5(15,2 + 0,08) - 1,95$  (3)
- 1.1.3 Simplify:  $\sqrt{81} + 2,25 \div 1,05$  (3)
- 1.1.4 Calculate 16% of R8 300,00. (2)
- 1.2 1.2.1 Mangu earns R1560 per week. If she saves 28% of this amount, how much does she save per week? (2)
- 1.2.2 31 October 2010 is a Sunday. What is the probability of 3 November 2010 being a Wednesday? (2)
- 1.3 Odongo earns R29 322 per year.
- 1.3.1 How much does Odongo earn in a month? (2)
- 1.3.2 If Odongo received an increase of R250,00 per month, what will his new salary per year be? (4)
- 1.4 Charles obtained 66 marks out of 150 in his Mathematical Literacy Project. Write his mark as a percentage. (2)
- 1.5 Sandile plans an overseas trip to the United States and needs to take foreign exchange from a local bank. If the exchange rate is R1 = US\$ 0,13, what is the amount in dollars would she get for R24 000,00? (2)

- 1.6 The figure given below is a rectangular frame with uniform thickness all around. The dimensions of the frame are as follows:  
Outside length = 40 cm, inside length = 30 cm and outside width = 20 cm.

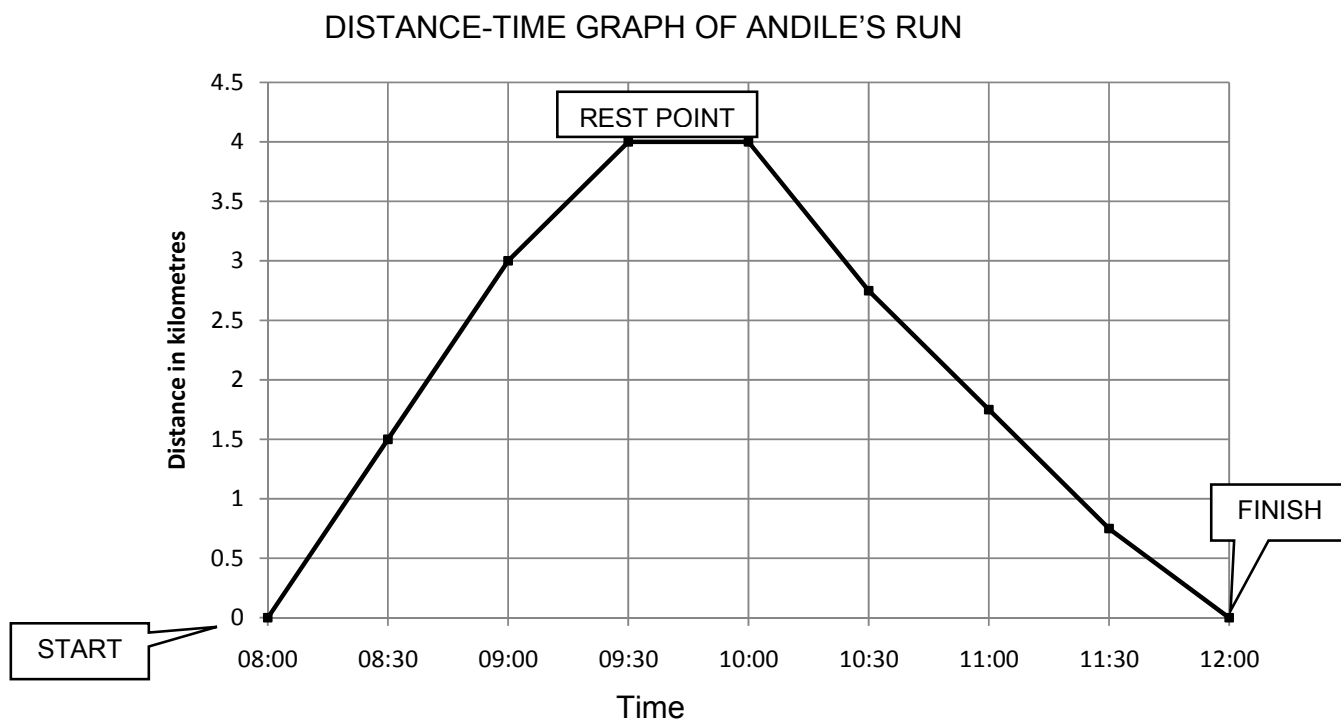


- 1.6.1 Determine the thickness of the frame. (3)
- 1.6.2 Calculate the inside perimeter of the frame.  
***Perimeter = 2(length + width)*** (3)

**[30]**

## QUESTION 2

- 2.1 The parents of City High School organised a fund raising run. The run started and ended at the school with one rest point along the way. Andile, one of the learners at City High School, participated in run. The figure below shows the distance-time graph of Andile's run.



2.1.1 At what time did the run start? (1)

2.1.2 What is Andile's average speed in km/min during the first half hour?

$$\text{Average speed} = \frac{\text{distance}}{\text{time}} \quad (2)$$

2.1.3 How long did Andile run before he reached the rest point? (1)

2.1.4 At what time did Andile's rest end? (1)

2.1.5 How long was Andile's rest? (2)

2.1.6 After his rest, how long did Andile take to arrive at the finish? (2)

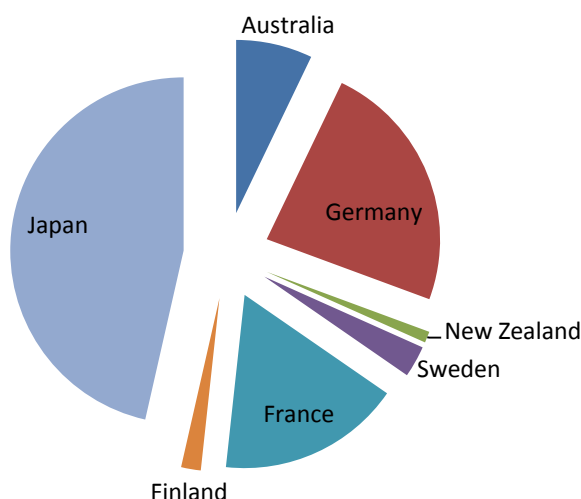
2.1.7 During which stage did Andile run faster; start to rest-point OR rest-point to finish? (1)

2.1.8 What was the total distance for the run? (1)

2.1.9 What was Andile's total time for the run, excluding his rest? (2)

- 2.2 Carbon dioxide emissions, also called carbon emissions, are the release of carbon (C) into the atmosphere. Carbon emissions in sectorial approach, which does not include fugitive emissions, as per International Energy Agency for 7 countries of the world in the year 1999, are represented in a pie-chart and table below.

Source: International Energy Agency



**Note:** The carbon emissions for the country Sweden is left blank in the table.

TABLE 1: CARBON EMISSIONS PER COUNTRY	
Country	Carbon emission (k tons)
Australia	101 565
Germany	335 175
New Zealand	14 965
Sweden	--
France	243 674
Finland	26 149
Japan	662 161
<b>TOTAL</b>	<b>1 425 700</b>

- 2.2.1 Which country emits the highest volume of carbon to the atmosphere? (1)
- 2.2.2 Calculate the carbon emissions in Sweden. (3)
- 2.2.3 Which TWO countries have below 30 000 k-tons level of carbon emissions? (2)
- 2.2.4 What percentage of the total carbon emissions in the world are produced by Germany? (round off your answer to 1 decimal place) (3)

- 2.2.5 Write the following as a fraction in its simplest form:

$$\frac{\text{Carbon emission by New Zealand}}{\text{Carbon emission by Australia}} \quad (2)$$

- 2.2.6 Determine the following ratio:

***Carbon emission produced by Finland: carbon emission produced by New Zealand.***

*(Write your answer without decimals.)*

(2)

**[26]**

### QUESTION 3

- 3.1 Tanana lives in a rural village in the Eastern Cape. As a result of the Government's promise to provide electricity to rural areas in South Africa, Tanana's village received electricity in January 2003. The figures below show the monthly electricity consumption (in kilowatt-hours) of Tanana's household between April 2003 and March 2004. The figures are given in ascending order.

712; 735; 737; 765; 766; 801; 805; 807; 807; 822; 828; 837

- 3.1.1 What is the range? (2)

- 3.1.2 Write down the mode. (1)

- 3.1.3 Calculate the median. (2)

- 3.1.4 Calculate the **mean** for the above data set. (3)

- 3.2 Tanana is a very important member of his community. He found that access to communication services such as fixed-line telephones is limited in the village. He decides to set up a telephone centre in his village. He plans to rent a container, install telephone lines and then charge people for using his telephones.

Tanana has worked out the following:

- The container will cost him R320 per month in rent.
- The telephone company will charge him R120 per phone per month to rent each phone. He decides to rent ten phones.
- The telephone company will charge him 25c per unit for his telephone usage.
- Electricity for the lights in the container will cost R160 per month.
- He charges customers R2,55 per unit.
- He will employ one worker at a cost of R2 000 per month.

- 3.2.1 Calculate the fixed monthly costs that Tanana spends on rent (for both the container and the phones), electricity and wages. (4)

3.2.2 Tanana records his monthly costs in a table.

TABLE 2: Tanana's monthly costs

Number of units used	400	800	1200	2000	2800	3200
Cost (in Rand)	3780	A	3980	4180	4380	B

Use the formula: Total monthly costs = Fixed monthly costs + (number of units used x R0,25) to calculate:

(a) A (2)

(b) B (2)

3.2.3 Tanana also records his possible monthly revenue in a table.

TABLE 3: Tanana's monthly revenue

Number of units used	400	800	1200	2000	2800	3200
Monthly revenue (in Rand)	1020	2040	C	5100	D	8160

Use the formula: Monthly revenue = Number of units used x R2,55 to calculate:

(a) C (2)

(b) D (2)

3.2.4 On the set of axes given in **ANNEXURE A** draw graphs of both Tanana's costs and revenue. (6)

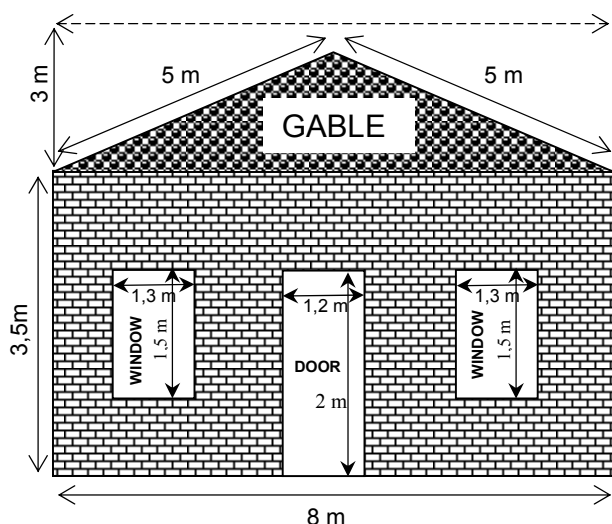
3.2.5 Use your graph to determine how many units of telephone calls he must sell per month if his business is to break even. (1)

**[27]**

## QUESTION 4

The figure below shows the front view of a house. The front of the house is made up of a rectangular wall and a triangular gable.

**NB:** A gable is generally the triangular portion of a wall between the edges of a sloping roof.

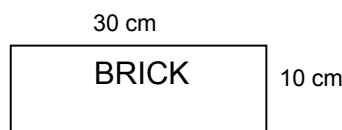


Use the measurements given on the figure to answer the following questions.

- 4.1 What is the height of the top of the gable from the ground? (2)
- 4.2 The top of the windows and door are all at the same height from the ground. What is the distance from the bottom of the each window to the ground? (2)
- 4.3 Calculate the area of:
- 4.3.1 the door (2)
- 4.3.2 one window (2)

You may use the formula: **Area of a rectangle = length x width**

- 4.4 Calculate the area of the rectangular part of the wall, excluding the door and windows.  
*Hint: Required area = Area of rectangular wall – area of one door – area of two windows* (5)
- 4.5 The dimensions of the front face of a brick are 30 cm by 10 cm as seen in the diagram. Calculate the area of the front face in square metres. **NB:  $1 \text{ m}^2 = 10\,000 \text{ cm}^2$**  (3)





- 4.6 The builder has worked out that 724 bricks will be required to build the rectangular wall. However, because of breakages he will order a further 5% to the number of bricks required. How many whole bricks will the builder order? (2)
- 4.7 The cost of one brick is R6,75. Calculate the total cost of bricks ordered for the rectangular wall. (2)
- 4.8 The gable of the house is triangular as shown in the figure. The area of the gable is  $12 \text{ m}^2$ .
- 4.8.1 35 bricks are used to build  $1 \text{ m}^2$  of the gable. How many bricks, excluding any breakages, would be used to build the gable shown? (2)
- 4.8.2 One litre of paint is needed to paint  $2,5 \text{ m}^2$  of the gable. How many litres of paint are needed to paint the gable shown?  
(Give your answer to the nearest litre.) (2)

**[24]****QUESTION 5**

A recipe for Irish lamb stew from a book is given below. The book uses imperial measures. Two tables are shown below, one showing the ingredients required and the other the conversions.

**TABLE 4A: INGREDIENTS FOR IRISH LAMB STEW**

INGREDIENTS	UNITS
Neck of lamb	2,5 lb
Sliced onions	12 oz
Sliced carrots	8 oz
Potatoes (pealed and sliced)	1 lb
Salt and pepper	as required

**TABLE 4B: CONVERSIONS BETWEEN IMPERIAL AND METRIC UNITS**

IMPERIAL UNITS	APPROXIMATE METRIC EQUIVALENT UNITS
1 lb	450 g
1 oz	28 g
1 pint	590 ml
$^{\circ}\text{F}$	$^{\circ}\text{C} = \frac{(^{\circ}\text{F} - 32^{\circ})}{1,8}$

**Oven Setting**

Set at 335 °F and increase to 350 °F.

Cut the lamb into pieces and put layers of meat and vegetables into a 3 pint dish, finishing with a layer of potatoes on top. Pour in water half-way up the dish. Cover and cook at 335 °F for 2 hours. Remove lid and cook for further half an hour at 350 °F until the potatoes on top are golden brown.

**This serves 4 people.**

5.1 Use the conversion table given to convert the following imperial units to approximate metric units.

5.1.1 2,5 lb of neck of lamb (2)

5.1.2 12 oz of sliced onions (2)

5.2 Convert 350 °F to °C. Give the answer to the nearest whole number. (4)

5.3 Convert 3 pints to litres. (**1 litre = 1 000 ml**) (3)

5.4 Calculate the quantity of neck of lamb that is required to **serve 10 people**. (5)

5.5 The price of lamb is R65,00 per kilogram. What is the price per pound (lb) (1lb = 0,45 kg)? (2)

**[18]**

**QUESTION 6**

6.1 The Umgeni Valley Nature Reserve in KwaZulu-Natal is a famous nature reserve with a river frontage. It also offers daily environmental education workshops for the public. These workshops are usually well attended. The number of people attending the workshops over a seven day period is given in

**TABLE 5: Number of people attending the environmental workshop at the reserve**

DAYS	NUMBER OF PEOPLE
Wednesday	55
Thursday	85
Friday	185
Saturday	150
Sunday	200
Monday	80
Tuesday	50

- 6.1.1 Draw a bar graph on ANNEXURE B to show the number of people attending the environmental workshops as given in TABLE 5. (7)
- 6.1.2 On which day was the workshop full to its capacity? (1)
- 6.1.3 On which day did the second-largest number of people attend the workshop? (1)
- 6.1.4 On which day did the smallest number of people attend the workshop? (1)
- 6.1.5 The cost for daily attendance of the environmental workshop is shown below.

Persons attending workshop	Price (R)
Adult	20
Children under 12 years	10
Learners in school uniform	5

- (a) Calculate the income earned by the reserve on Thursday, if the environmental workshop was attended by 40 learners in school uniform, 20 children under 12 years and the remaining 25 were adults? (4)
- (b) If the reserve's expenses for a workshop are R800, did the reserve make a profit or loss on Thursday? (1)
- 6.2 Study the map of the western side of the Umgeni Valley Nature Reserve in KwaZulu-Natal given in **ANNEXURE C** and answer the following questions.
- 6.2.1 Give the grid reference for the following.
- (a) Inkonka camp (1)
- (b) Wilderness area (1)
- 6.2.2 In what direction is the Cascades Falls from the Shelter Falls Plunge pool? (1)
- 6.2.3 The distance on the map between Indulo car park and Inkonka car park is approximately 11,5 cm. Use the scale **1 cm: 125 m** to calculate the actual distance between Indulo car park and Inkonka car park.
- (Give your answer to the nearest metre.) (3)

- 6.2.4 The distance by car from Indulo car park to Inkonka car park is 2,18 km. Peter drives this distance at an average speed of 16 km/h. How long will this drive take? (Give your answer to the nearest minute)

Use the formula:  $\text{time} = \frac{\text{distance}}{\text{speed}}$

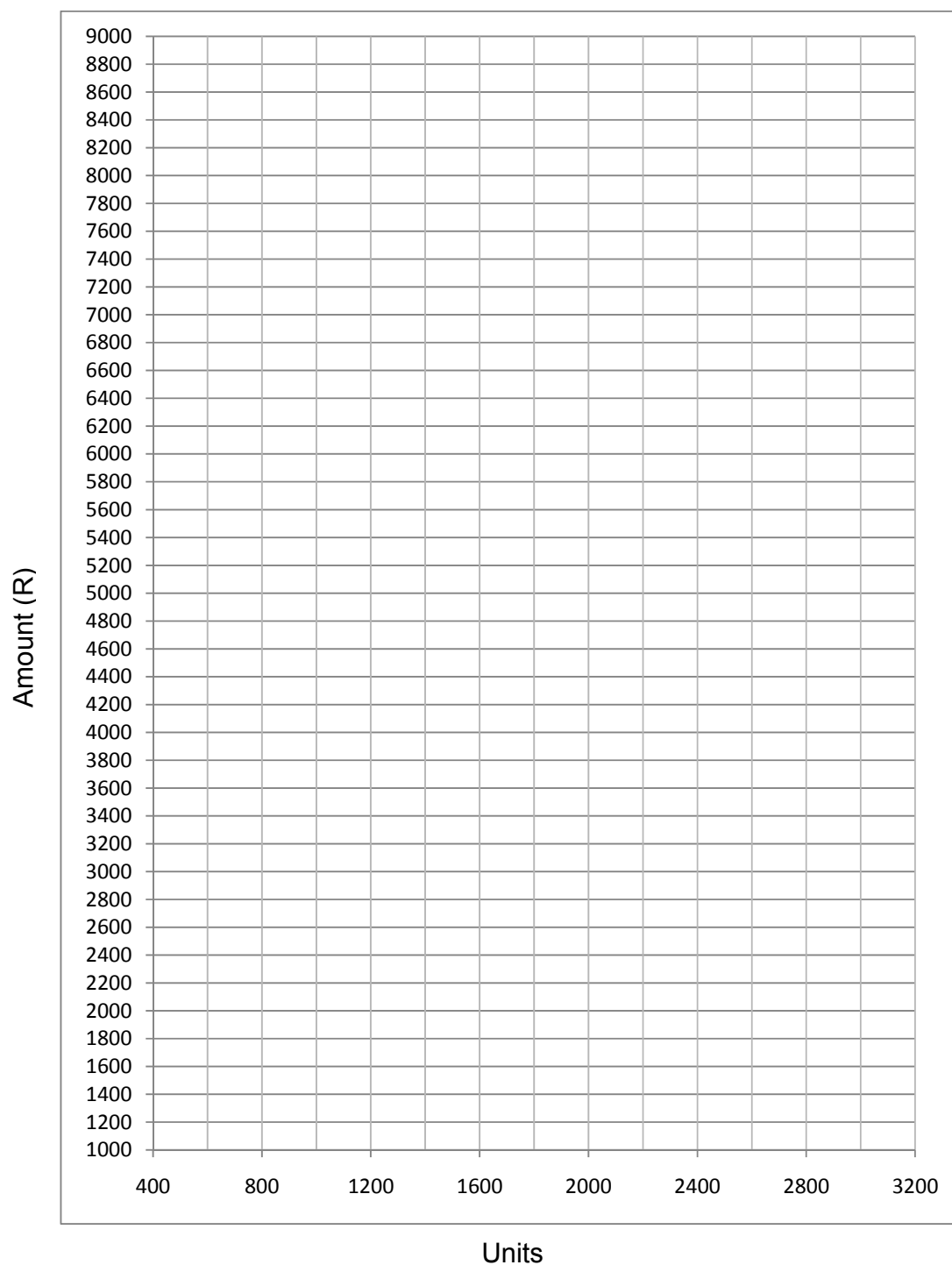
(4)  
[25]

**TOTAL: 150**

## QUESTION 3.2.4

## ANNEXURE A

TANANA'S COST AND REVENUE GRAPH



## QUESTION 6.1

## ANNEXURE B



## QUESTION 6.2

## ANNEXURE C

