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Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2013

MATHEMATICAL LITERACY P2

MARKS: 150

TIME: 3 hours



This question paper consists of 13 pages including a 3-page annexure.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. QUESTIONS 2.2.3 and 4.1.6 must be answered on the attached ANNEXURES. Write your name in the spaces provided and hand in the annexures with the 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 calculations 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

- 1.1 Anver, who was recently retrenched at his workplace decided to start his own taxi business. From his former employer, Anver was paid out a lump sum amount of R400 000. He used some of this money to pay a deposit of 15% on a vehicle to the car dealer. After doing some research, he decided to buy a Toyota Quantum 2.5D – 4D 14-seater passenger bus.



Price: R392 900

Interest Rate: Prime rate + 1%

Term: 72 months

- 1.1.1 Calculate the deposit he paid on his purchase. (3)

- 1.1.2 What percentage of the money he received from his former employer, did he use for the deposit? (2)

- 1.1.3 After paying the deposit for the vehicle, he invested the balance for the same period over which he will pay for the vehicle. The best offer he could get, was 8,75% interest per annum compounded half yearly. Calculate how much his investment will be worth at the end of the period.

Use the formula: $A = P(1 + i)^n$ where;

A = Future value

P = Starting value

i = interest rate and

n = number of years

(6)

- 1.1.4 When he bought the vehicle, the prime rate was 8,5%. Calculate how much Anver will pay for the vehicle at the end of the period.

Use the formula: $A = P(1 + ni)$ where;

A = Future value

P = Starting value

i = interest rate and

n = number of years

(5)

- 1.1.5 The salesman told Anver that the percentage that he will pay on the interest is less than 40%. By means of calculation show whether the statement is true or not. (4)

- 1.1.6 Besides his monthly instalment on the vehicle, Anver still has to pay for service and administration fees, for the duration of the period which will be charged against his monthly account. Calculate the monthly service and administration fee if his monthly instalment amounts to R7 391,29. (3)
- 1.2 Anver decided that he will only operate a service between a taxi rank in Port Elizabeth and a taxi rank in Uitenhage. The cost of petrol for each trip will cost R50 and the fare (price) per passenger R15.

Study the following table and answer the questions that follow.

Table 1

Number of passengers (n)	2	4	6	B	10	12	14
Profit for the trip in Rand (p)	A	10	40	70	100	130	160

- 1.2.1 Write down a formula to describe the relationship between the number of passengers and the profit. Use number of passengers as (n) and profit as (p). (3)
- 1.2.2 Use your formula in QUESTION 1.2.1 to calculate the values of **A** and **B** respectively. (4)
- 1.2.3 According to the table, when will it not be profitable for Anver to operate this service? (2)
- 1.2.4 It takes Anver 20 minutes for a single trip plus 10 minutes for loading and offloading passengers. Calculate his profit per day if he works for 8 hours per day and his taxi is loaded with the maximum number of passengers for every trip. (5)

[37]

QUESTION 2

- 2.1 Study the map, an extract of an area in the Western Cape (**ANNEXURE 2.1**), and answer the following questions.
- 2.1.1 Write down the grid reference of Oosterzee station. (2)
- 2.1.2 In which direction will you travel from Boston (A4) to Joostenville (B2 and B3)? (1)
- 2.1.3 Show with the necessary calculations that the scale of the map is 1 : 25 000. (3)
- 2.1.4 Debbie walks from her house on the left-hand corner of Sixth Avenue and Lincoln Street (C4) in a southerly direction and turn right into Voortrekker Road to the Leipoldt Hospital (D3). Calculate the distance she has walked in kilometres. (3)
- 2.1.5 If Debbie walks at an average speed of 1,5 kilometres per hour (km/h), how long will it take her to reach the Leipoldt Hospital? Give your answer in minutes. (4)
- 2.2 The staff at the Leipoldt Hospital constitute of 3 327 nurses, 773 doctors, 1 246 domestic workers, 1 526 administration clerks and *others*.
- 2.2.1 Calculate how many staff members are employed at the Leipoldt hospital if the *others* are 20% of the total staff. (5)
- 2.2.2 What is the probability that one of the staff members that Debbie approach is not an administration clerk? (3)
- 2.2.3 Illustrate by means of a pie chart how the staff employed at Leipoldt Hospital is divided. Show all calculations in your answer book and use it to draw the pie chart in ANNEXURE 2.2.3. (12)
- [33]**

QUESTION 3

- 3.1 Ms Kriel, an educator and coach for the girls' soccer team at Eastville High School, wants to raise funds for new soccer gear (outfits). She came up with the idea of having a "Miss Eastville High" beauty contest. All the girls that are interested collected the entry forms from Ms Kriel.

In order for entrants to be successful, they must meet the following criteria:

- ❖ Height (length) in meters must be at least 1,55 m.
- ❖ Weight (mass) in kilograms must be at least 55 kg.
- ❖ Body Mass Index (BMI)* must be normal.

***NB.**

BMI is a measure to determine the best weight range for a person's health.

BMI	MEANING
Below 18,5	Underweight
18,5 – 24,9	Normal weight
25 – 29,9	Overweight
30 and above	Obese

After the closing date Ms Kriel recorded the following data from the entrants (**E***):

Table 2

E*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Height	1,56	1,63	1,55	1,70	1,52	1,59	1,30	1,55	1,60	1,68	1,67	1,65	1,56	1,55	1,53	1,51
Mas	56	60	44	70	52	60	45	61	61	57	62	72	55	71	58	55
BMI	N	N	U	N	N	N	OW	OW	N	N	N	OW	N	O	N	N

KEY:

N – Normal; U – Underweight; OW – Overweight; O – Obese

- 3.1.1 Ms Kriel claims that some of the entrants did not meet the criteria. Is this statement valid or not? Use ONE example from the table to justify your answer. (4)
- 3.1.2 How many entrants do not qualify for the contest? (2)
- 3.1.3 Show that the average (mean) height of the entrants who qualify is 1,62 m. (3)
- 3.1.4 Determine the median weight for the entrants who qualify. (3)

- 3.1.5 Although Entrant number 8 meets the requirements of the height and the weight (mass), she does not meet the criteria for the BMI. By using the following formula, show why she does not meet the requirement for the BMI.

$$\text{BMI} = \frac{(\text{Mass in kg})}{(\text{Height in m}^2)} \quad (4)$$

- 3.1.6 At the time of the contest, the school had exchange students from America. One of the learners claimed that they don't use the same formula as in QUESTION 3.1.5, but the following formula:

$$\text{BMI} = 703 \times \frac{(\text{Mass in pounds})}{(\text{Height in inches})^2}$$

Prove to the learner that the metric formula for the BMI given in QUESTION 3.1.5 can be converted to calculate the BMI for imperial measurements where 1 pound = 0,4536 kg and 1 inch = 2,54 cm. (5)

- 3.1.7 What do you think are the reasons for people becoming obese? Give TWO possible reasons. (2)

- 3.1.8 Suggest TWO ways to people who suffer from obesity how they can reduce the risk of being obese. (2)

- 3.2 In total there are 17 girls for the soccer team including reserve players. Ms Kriel shopped around and found the best prices for the soccer gear. The following was the best that she could find:

Table 3

ITEM	PRICE
T-shirt	R263,15 each (VAT excluded)
Shorts	R149,99 each (VAT included)
Socks	R29,99 each (VAT included)
Boots	R350,00 per pair at 10% discount for the first 10 pairs and thereafter an extra discount of 5% per pair (VAT included)

***VAT is calculated at 14%.**

Ms. Kriel hired the community hall for the event on the condition that she would pay R5,00 for every ticket paid at the door. The venue can only accommodate 450 people. The tickets were priced at R 40,00 each. All tickets had to be paid at the door and not in advance. The hall was two thirds full. Taking all of the above in consideration, do you think Ms Kriel will reach her goal of having enough money to buy the soccer gear? Show all calculations.

(15)
[40]

QUESTION 4

- 4.1 The Wheelers Disabled Society in Port Elizabeth approached local schools to take part in a clean-up campaign in order to raise funds for those who cannot afford to buy their own wheelchair. After the Easter weekend, they have identified a picnic area of seven hectares where a lot of litter was left. The litter (bottles, plastic, cans, tins, paper, etc.) collected will then be recycled to raise funds.

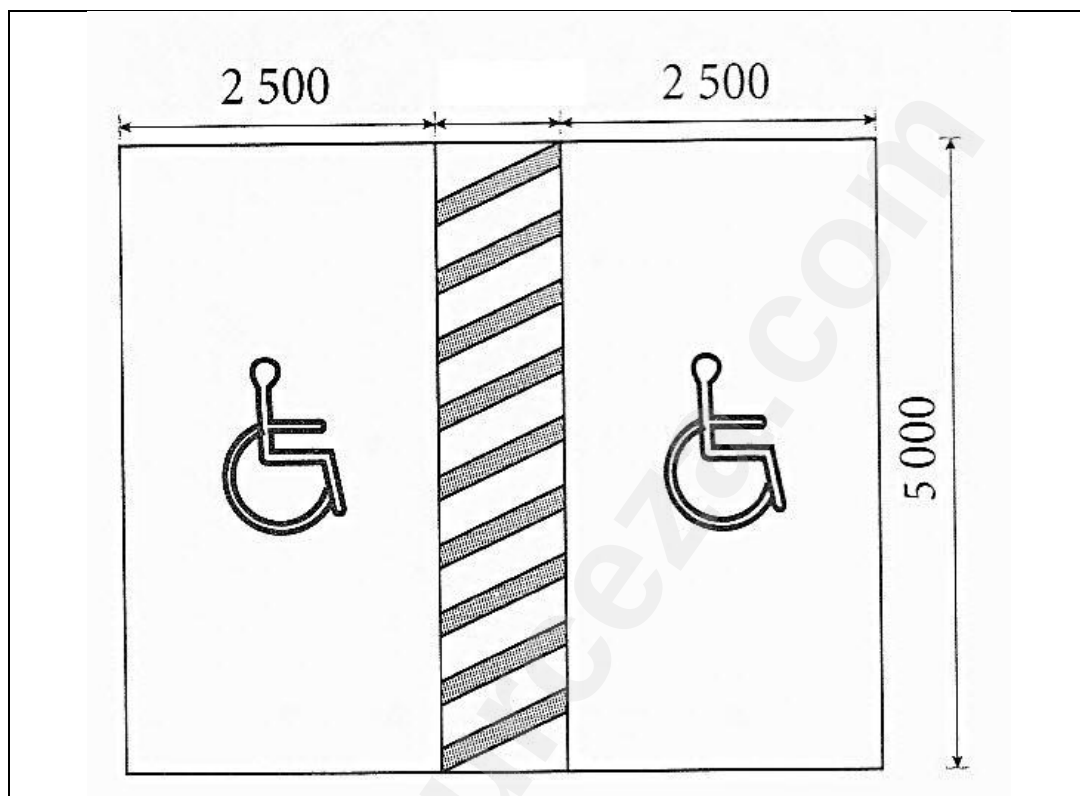
The executive members of the society compiled the following table to show the number of learners who volunteered against the number of square meters that each learner had to clean. (1 hectare = 10 000 m²).

Table 4

No. of square meters (m²)	3 500	1 750	A	700	350	100
No. of learners	20	40	50	100	B	700

- 4.1.1 Name the quantity that remains constant in each of the situations above. (1)
- 4.1.2 Calculate the missing values **A** and **B** respectively. (4)
- 4.1.3 How many learners must volunteer to clear a littered area of 875 m²? (2)
- 4.1.4 Use the table above to write down a formula. Use number of square meters as (*s*) and the number of learners as (*l*). (3)
- 4.1.5 Complete: The number of square meters that a learner has to clean, is inversely proportional to ... (1)
- 4.1.6 Use the information in the table to draw a graph using ANNEXURE 4.1.6 to show the relationship between the number of square meters and the number of learners. (5)

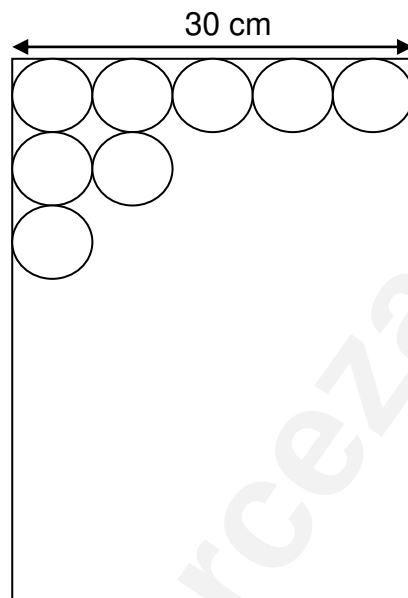
- 4.2 The following diagram (not drawn to scale) shows two standard parking bays with dimensions, 2 500 mm wide and 5 000 mm long each. To be suitable for disabled people there must be an aisle between the two standard parking bays as illustrated in the diagram or a single parking bay must be wider than a standard parking bay.



- 4.2.1 Why do you think there must be an aisle between a double parking for disabled people or that a single disabled parking bay is wider than a standard parking bay? (2)
- 4.2.2 The width for the disabled parking bay differs from that of a standard parking bay. If the width of the aisle is 40% less than that of a standard parking bay, determine the width of ONE disabled parking. (3)
- 4.2.3 Hence, calculate the difference in area between a standard parking bay and a disabled parking bay. Give your answer in m^2 . (4)
- [25]

QUESTION 5

- 5.1 Naziah, a prospective chef, is trying out a new savoury called half-moons. To make this savoury she has to use pastry, roll it out and cut into circles which will be folded into half-moons. The circles (equal in size) will be cut across the length and the width of the rectangular rolled out pastry. The following diagram (not drawn to scale) shows the rolled out pastry with some of the circles.



The following formulae can be used.

Area of rectangle = Length x Breadth

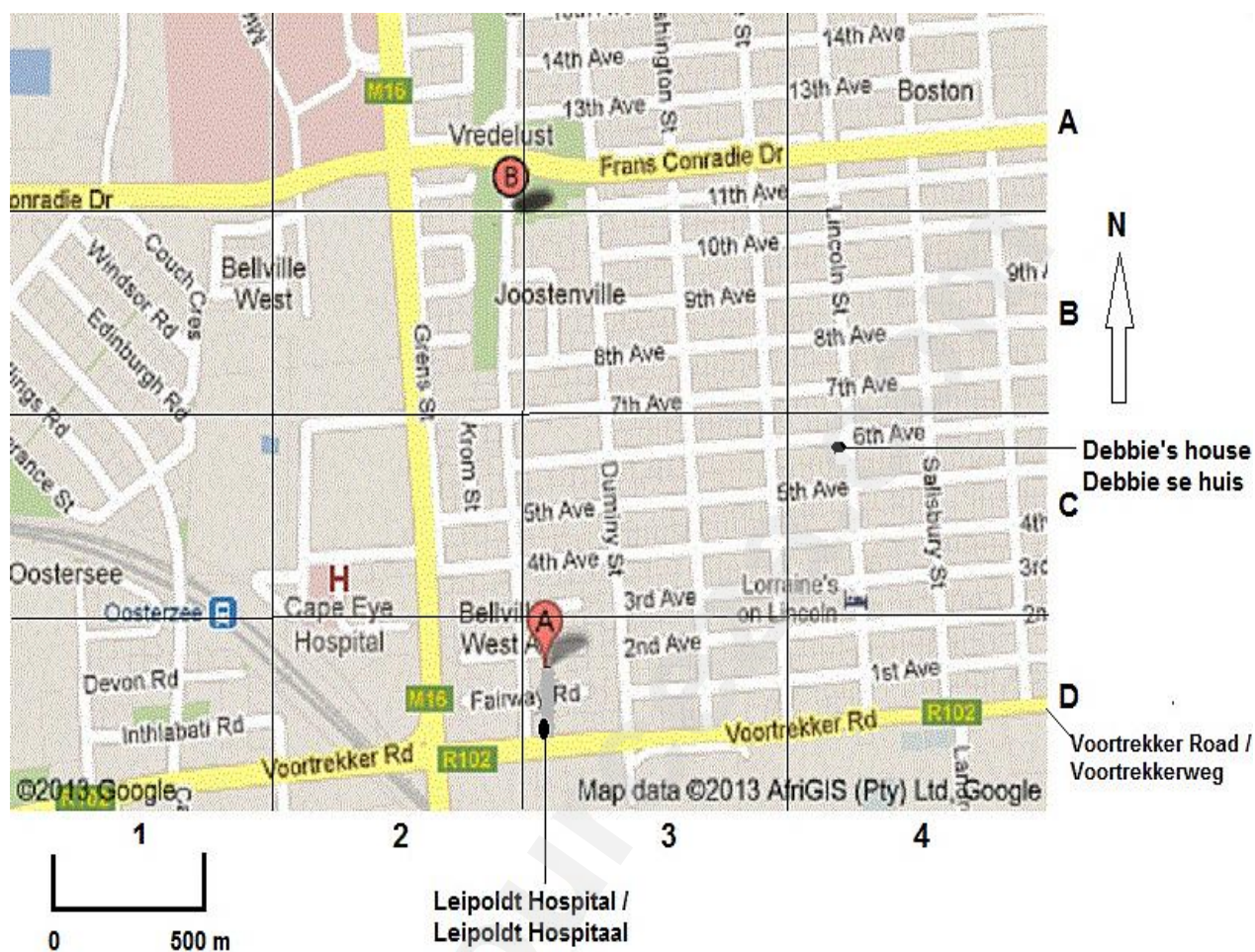
Area of circle = πr^2 where $\pi = 3,14$

- 5.1.1 The area of the rolled out pastry is $1\,440\text{ cm}^2$. Determine the length of the pastry. (2)
- 5.1.2 Determine the diameter of ONE of the circles. (1)
- 5.1.3 Determine how many circles can be cut out of the rolled pastry. (3)
- 5.1.4 The remainder of the pastry (wasted pastry) cannot be rolled again as the pastry is going to lose its puffiness. Calculate the area of the wasted pastry. (4)
- 5.2 If Naziah makes 10 dozen of these half-moons of which 75% is filled with mince filling and the rest with chicken filling. Calculate the probability that you will choose two consecutive half-moons with chicken filling without replacing the first one. Write your answer in the simplest fraction. (5)

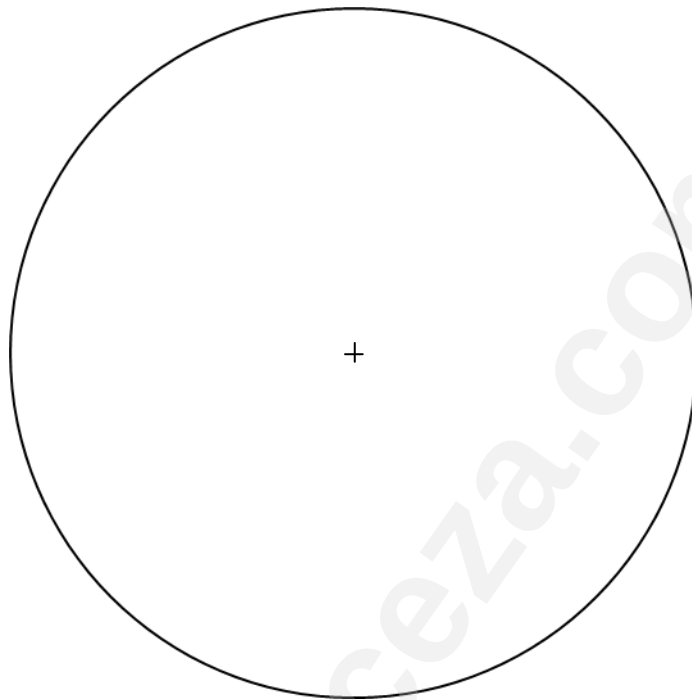
[15]

TOTAL: 150

ANNEXURE 2.1



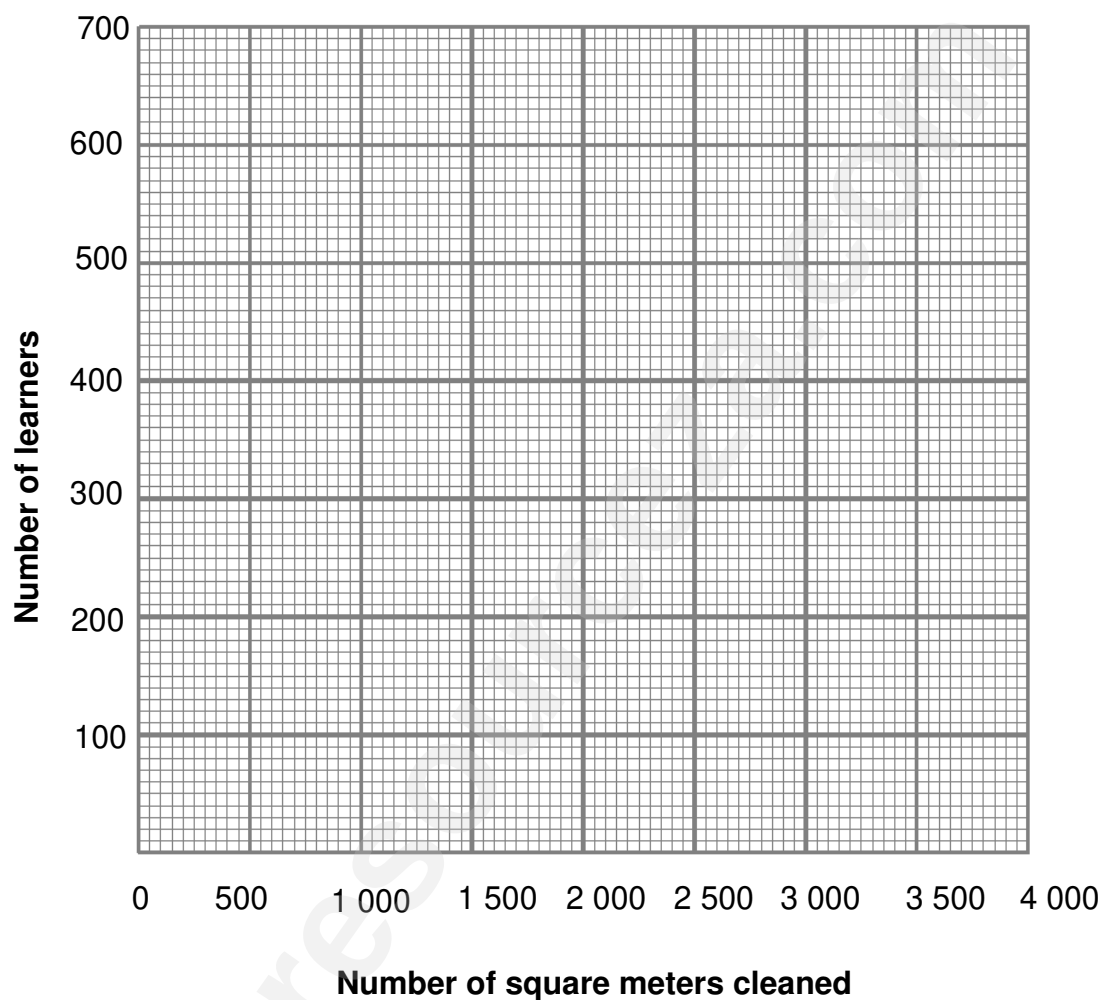
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ANNEXURE 2.2.3**NAME:** _____

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ANNEXURE 4.1.6**NAME:** _____

**Number of square meters cleaned by each learner
changes as the number of learner changes**



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