

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2017

MATHEMATICAL LITERACY P2

MARKS: 150

TIME: 3 hours

This question paper consists of 8 pages and an 8-page addendum
(with a 1-page answer sheet attached).



INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Use the ADDENDUM with ANNEXURES for the following questions:

ANNEXURE A for QUESTION 1.1

ANNEXURE B for QUESTION 2.1

ANNEXURE C for QUESTION 2.2

ANNEXURE D for QUESTION 3.1

ANNEXURE E for QUESTION 3.2

ANNEXURE F for QUESTION 4.2

ANSWER SHEET 1 for QUESTION 4.2.4 which is attached to the addendum.

Write your NAME in the spaces provided on the ANSWER SHEET and hand in the ANSWER SHEET with your ANSWER BOOK.

3. Number the questions correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
6. Show ALL calculations clearly.
7. Round off ALL final answers appropriately accordingly to the given context, unless stated otherwise.
8. Indicate units of measurement, where applicable.
9. Maps and diagrams are NOT drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

- 1.1 Mrs May is a single mother who is an educator earning R336 000 per annum. She has two children, a 19-year-old boy who is at university and a 24-year-old girl who is not studying nor working. Mrs May is a member of a medical aid scheme.

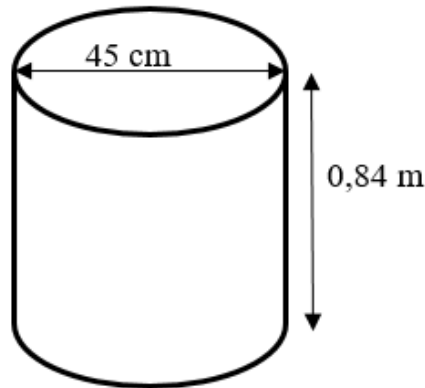
She has two options to choose from.

Study the information on ANNEXURE A to answer the questions below.

- 1.1.1 Identify the salary row to which Mrs May belongs for both medical aid options. (2)
- 1.1.2 Calculate the difference in contribution for the whole family between the two medical aid options for a month. (6)
- 1.1.3 If she chooses Emerald and R2 530 is deducted from her salary, calculate the percentage that the government subsidises her for medical aid. Round your answer to one decimal place.
- Note: Government subsidy is the difference between medical aid amount and the amount deducted from salary.** (3)
- 1.1.4 The medical aid scheme has a fitness exercise programme. What is the importance of such a fitness programme? (2)

1.2

Mrs May had an initiation ceremony for her son in December 2015. They had traditional beer brewed in big cylindrical containers with dimensions as shown below:



Containers need to be 70% full of beer to allow space for fermentation.

Note: Fermentation is a process occurring during brewing of the traditional beer which releases gas in the form of bubbles on top of the beer.

You may use the formulae:

Volume = $\pi \times \text{radius}^2 \times \text{height}$

Area of rectangle = $\text{length} \times \text{breadth}$

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

Where $\pi = 3,142$

1.2.1 Calculate the volume of the traditional beer in 1 container in cubic meters (m^3). (4)

1.2.2 Mrs May has a store room which has a length of 2 m and a width of 1,5 m. She claims that she is able to pack 13 big beer containers on the floor of her store room. Verify, showing all the necessary calculations, whether her claim is valid. (6)

1.3

Mrs May is planning for her son's graduation and decides to invest her bonus money for two years. She invests the money in an institution offering interest that is compounded annually at an interest rate of 5,8% for the first year and 6,5% for the second year.

Note: Annual bonus money is a 13th cheque which is equal to the monthly salary without deductions

Note: She only used one year's annual bonus

Note: Her annual income is R336 000 after she received an increase of 6,5%

1.3.1 Calculate her annual income before she received the increase. (3)

1.3.2 Calculate how much money will be paid out to her after the two-year period. (5)

[31]

QUESTION 2

- 2.1 In 2015 people were employed to develop reading material for schools. They were paid according to the number of pages they developed. Rates and information on remuneration are given in ANNEXURE B.

They spent 7 days developing the material. They travelled daily to and from the centre where they worked. They worked 10 hours per day.

- 2.1.1 One of the employees developed 20 pages in 10 hours. Show, using calculations, whether the employee was within the norm time, or not. (4)

- 2.1.2 Calculate the percentage increase in rate of developing material from 2013 to 2015. (3)

- 2.1.3 The manager is convinced that the R130 000 that he has budgeted for 10 employees to each develop 161 pages in seven days will be R4 000 more than the amount needed.

Note: Two employees live a distance of 35 km from the centre; three live 25 km from the centre; and the rest live 12 km from the centre.

Verify, showing all necessary calculations, whether the manager's statement is valid. (10)

- 2.2 Mr Reeva, a 58-year old USA citizen earning \$350 500 taxable income per year. The USA Tax Table is shown on ANNEXURE C.

- 2.2.1 Calculate how much tax Mr Reeva is paying per month. (5)

- 2.2.2 Mr Reeva is claiming that if his earnings were taxed in South Africa, he would be paying more tax per month. Use the South African Tax Table shown in ANNEXURE C to verify whether his statement is valid.

Given that **\$1 = R14,11** (7)

- 2.2.3 From the Tax Tables, it is evident that the more you earn, the more tax you pay. Mr Reeva claims that this is unfair. Support his claim by giving ONE reason. (2)

- 2.3 Two friends are travelling from East London to Uitenhage which is a distance of 311 km. They leave East London at 06:00. They stop at Nanaga for 30 minutes for refreshments.

If the two friends reach Uitenhage at 08:55, show with calculations whether they did not exceed the average speed limit of 120 kilometres per hour.

You may use the formula: **Speed** = $\frac{\text{Distance}}{\text{Time}}$ (6)

- 2.4 Marks are recorded and analysed after marking has been completed and marks for 2 schools are compared. In School A, the maximum mark is 87 and the minimum mark is 28 while the mean mark is 43. In School B the maximum mark is 76, the minimum mark is 53 with a mean mark of 56.

Which school has performed better? Give TWO reasons for your choice. (5)

[42]

QUESTION 3

3.1 ANNEXURE D shows a strip chart from Pretoria to Windhoek.

A couple with two adult children (both females), from Johannesburg, plan a holiday and decide to go to Windhoek. On their way to Windhoek they visit the Moremi Wildlife Reserve in Maun. When travelling to Maun they turn right at Lobatse and take the A1 route and then pass through Nata. On the first day they get accommodation at Moremi Wildlife Reserve and the next day proceed to Windhoek via Ghanzi.

Use the strip chart on ANNEXURE D to answer the following questions.

3.1.1 How many kilometres do they travel to Windhoek? (5)

3.1.2 Apart from route A1, which other routes do they travel on from Johannesburg? Also, give the names of the countries where these routes are found. (4)

3.1.3 At Moremi Wildlife Reserve there are two accommodation options:

Option 1: Self-catering chalets for 4 people at R1 550 per chalet per night

Option 2: A bed and breakfast at R550 per person sharing (with breakfast)

The couple stated that if they choose **Option 1** and decide to have breakfast at a restaurant at R95 per person, they will be able to save R300.

Show, with the necessary calculations, whether their statement is true, or not. (5)

3.1.4 At Moremi Wildlife Reserve there are 5 self-catering units accommodating 4 people and 3 self-catering units accommodating 6 people at extra cost if there are only 4 people.

If all self-catering units are still available when they are making their booking, determine the probability of getting a self-catering unit at no extra cost. Give your answer to the nearest percentage. (4)

3.1.5 Mr and Mrs Smith, who are friends to the couple, are also on their way from Johannesburg to Windhoek. They take a different route and spend a night at Sun City. From Sun City they proceed to Tshane to visit some friends. After their visit, they travelled on the A2 route to Windhoek.

The two families are claiming that the difference between the distance travelled by the couple with the two adults and the distance travelled by Mr and Mrs Smith, is 463 km. Verify, with the necessary calculations, whether the statement is valid. (5)

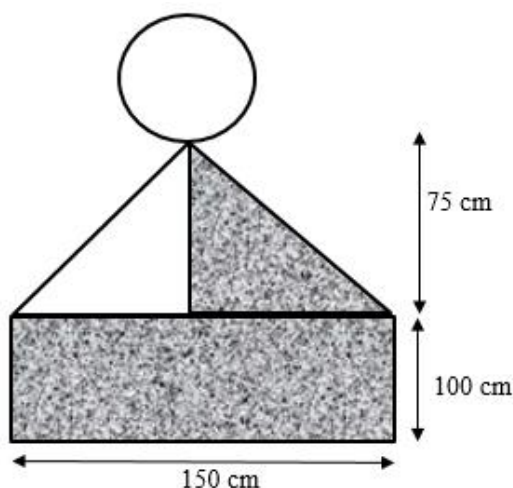
- 3.2 The table in ANNEXURE E has information on the performance of Grade 12 learners in some of the most popular subjects from 2013 to 2016.

- 3.2.1 Describe the trend of the percentage achieved in Mathematical Literacy from 2013 to 2016. (2)
- 3.2.2 Explain how the percentage achieved for Mathematics differ from the percentage achieved for Mathematical Literacy for the period 2013 to 2016. (2)
- 3.2.3 In January 2017 when the Minister of Education, Angie Motshekga, announced the 2016 matric results, she mentioned that in 2016 the enrolment for Mathematics increased from 263 903 to 265 810 and that of Mathematical Literacy decreased from 388 845 to 361 865. Write the difference in the Mathematics enrolment to the difference in the Mathematical Literacy enrolment as a ratio. (3)

[30]

QUESTION 4

- 4.1 People in Mrs. Sibeko's home village like colourful decorations. They have decided to decorate the outside walls of their community hall as shown in the diagram below.



Notes:

- Dimensions are as indicated
- Circumference of the circular part is 157,1 cm
- The two triangles are equal.

You may use the following formulae:

Area of rectangle = length \times width

Circumference of circle = $2 \times \pi \times$ radius

Area of triangle = $\frac{1}{2} \times$ base \times height

Area of circle = $\pi \times$ radius²; where $\pi = 3,142$

- 4.1.1 Calculate the diameter of the circular part of the decoration in metres. (4)
- 4.1.2 If the wall is 4 m high and the decorations are at equal distances from the top and the bottom, calculate the distance that the decoration is from the top and the bottom of the hall in metres. (4)

- 4.1.3 The decoration is painted using red paint for the shaded part and white paint for the unshaded parts. Paint is sold in 5 litre tins at R499 for the white paint and R505 for the red paint. Spreading rate for paint is 8 m^2 per litre. Two coats of each colour will be needed and 15 decorations will be painted.

Mr. Sibeko stated that the amount of money that they will spend for red paint will be twice the amount of money that they will spend for white paint.

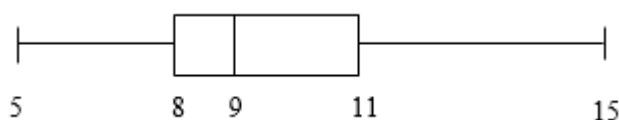
Verify, with the necessary calculations, whether this statement is valid or not. (12)

- 4.2 The map in ANNEXURE F is showing maximum temperatures for some towns and cities in South Africa and neighbouring countries.

- 4.2.1 What is the general direction of Polokwane from Calvinia? (2)

- 4.2.2 If the mean for the maximum temperature of all the towns and cities shown on the map is $26,762^\circ\text{C}$, calculate the modal value B for the 5 towns and cities represented by B on the map. (4)

- 4.2.3 The box and whisker diagram represents the minimum temperatures:



Calculate the difference between the interquartile ranges of the minimum temperatures and maximum temperatures. (7)

- 4.2.4 The box-and-whisker values for the minimum temperatures have already been plotted in ANSWER SHEET 1. Plot the box-and-whisker values for the maximum temperatures to complete a compound bar graph on the same ANSWER SHEET. (6)

- 4.2.5 Refer to the maximum temperatures as shown on the map and calculate the probability of having a temperature equal to or more than 28°C . Give your answer as a decimal fraction to three decimal places. (3)

- 4.2.6 The actual distance between East London and Cape Town is 1 045 km. Calculate the scale used on the map and write it in the form 1 : ... Give your answer to the nearest million. (5)

[47]

TOTAL: 150