



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2015

MATHEMATICAL LITERACY P2

MARKS: 150

TIME: 3 hours



This question paper consists of 14 pages, including an annexure of 1 page.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Use ANNEXURE A to answer QUESTION 4.1.
3. Number the answers correctly according to the numbering system used in this question paper.
4. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
5. Show ALL calculations clearly.
6. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
7. Indicate units of measurements, where applicable.
8. Start EACH question on a NEW page.
9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

- 1.1 Mr Pather heard from his friends how important it is to make provision for unforeseen circumstances such as sudden death due to tragic accidents. He realised that when a loved one dies, there is always a need of instant cash flow of money. He studied various funeral cover policies from different companies. The one that caught his eye is illustrated in the table below. Mr Pather's family consists of his wife and two children.

The following table illustrates the benefit and premium details in Rands of a funeral cover policy.

Table 1

| Funeral Cover | Main Member | Partner | Child Aged 14–21 | Child Aged 6–13 | Child Aged 1–5 | Family Plan Premiums |
|---------------|-------------|-----------|------------------|-----------------|----------------|----------------------|
| Year 1 | 20 000 | 20 000 | 20 000 | 10 000 | 5 000 | 89,95 |
| Year 2 | 21 000 | 21 000 | 21 000 | 10 500 | 5 250 | 97,15 |
| Year 3 | 22 050 | 22 050 | 22 050 | 11 025 | 5 512,50 | A |
| Year 4 | 23 152,50 | 23 152,50 | 23 152,50 | 11 576,25 | B | 113,31 |
| Year 5 | 24 310,13 | 24 310,13 | 24 310,13 | 12 155,06 | 6 077,53 | 122,38 |
| Year 10 | 31 026,57 | 31 026,57 | 31 026,57 | C | 7 756,64 | 179,81 |
| Year 15 | 39 598,64 | 39 598,64 | 39 598,64 | 19 799,32 | 9 899,66 | 264,20 |
| Year 20 | D | D | D | 25 269,50 | 12 634,75 | 388,20 |

Compulsory Annual Increases:

Annual benefit Increase 5%

Annual Premium Increase 8%

- 1.1.1 Calculate the following missing values:

- The premium in the 3rd year (**A**) (2)
- The pay-out value of a child aged 1–5 years in the 4th year (**B**) (2)
- The pay-out value of a child aged 6–13 years in the 10th year (**C**) and (3)
- The pay-out value of a child aged 14–21 years, the partner or the main member in the 20th year (**D**). (3)

- 1.1.2 Explain the relationship between the pay-out amounts of a child at the ages of 1–5, at the ages of 6–13 and the ages of 14–21. (3)

- 1.1.3 As the premium increases every year, the funeral cover also increases. Why do you think that there is a need for an increase in the funeral cover? (2)

- 1.1.4 Why do you think there is a difference in percentage increase between the pay-out values and the premium values? (2)

- 1.1.5 Give ONE advantage and ONE disadvantage of paying money into a funeral cover plan. (4)

- 1.2 Mr Pather, a 37-year-old store manager, studied the tax tables for the 2014–2015 and 2015–2016 financial years to determine the difference in tax that he will pay for the two financial years. He ignored the medical and pension deductions. To answer the questions below, use the following tax tables.

Table 1: Tax table for 2014–2015 financial year

| Taxable Income (R) | Rate of Tax |
|--|---|
| R0 – R174 550 | 18% of each R1 |
| R174 551 – R272 700 | R31 419 + (25% of amount above R174 550) |
| R272 701 – R377 450 | R55 957 + (30% of amount above R272 700) |
| R377 451 – R528 000 | R87 382 + (35% of amount above R377 450) |
| R528 001 – R673 100 | R140 074 + (38% of amount above R528 000) |
| R673 101 + | R195 212 + (40% of amount above R673 100) |
| REBATES | |
| Primary Rebate | R12 726 |
| Secondary Rebate (Persons 65 and older) | R7 110 |
| Tertiary Rebate (Persons 75 and older) | R2 367 |

[Source: www.sars.gov.za]

Table 2: Tax table for 2015–2016 financial year

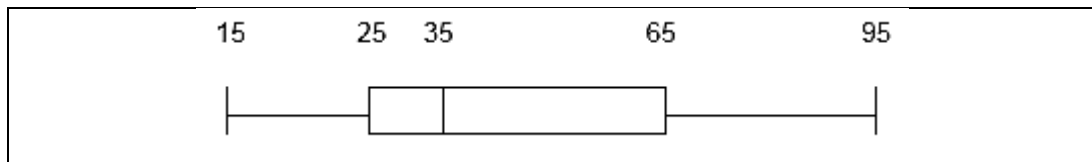
| Taxable Income (R) | Rate of Tax |
|--|---|
| R0 – R181 900 | 18% of each R1 |
| R181 901 – R284 100 | R32 742 + 26% of the amount above R181 900 |
| R284 101 – R393 200 | R59 314 + 31% of the amount above R284 100 |
| R393 201 – R550 100 | R93 135 + 36% of the amount above R393 200 |
| R550 101 – R701 300 | R149 619 + 39% of the amount above R550 100 |
| R701 301 + | R208 587 + 41% of the amount above R701 300 |
| REBATES | |
| Primary Rebate | R13 257 |
| Secondary Rebate (Persons 65 and older) | R7 407 |
| Tertiary Rebate (Persons 75 and older) | R2 466 |

[Source: www.sars.gov.za]

- 1.2.1 From the two tax tables above, it is evident that the rates of tax differ from one financial year to the next financial year. Give a reason for this difference. (2)
- 1.2.2 Mr Pather claims that he will be paying more tax per month in the 2015–2016 financial year than in the 2014–2015 financial year. He made this statement at the end of February 2015. He earns a monthly salary of R15 800,75 which remains unchanged for March 2015. Verify with the necessary calculations whether his statement is true or not. (9)

- 1.3 A survey was done by Mr Pather in the area where he lives about the amounts in rand that people save every month for unforeseen circumstances. One hundred and forty people took part in the survey.

Mr Pather recorded his data and used the following box-and-whisker plot to illustrate the data.



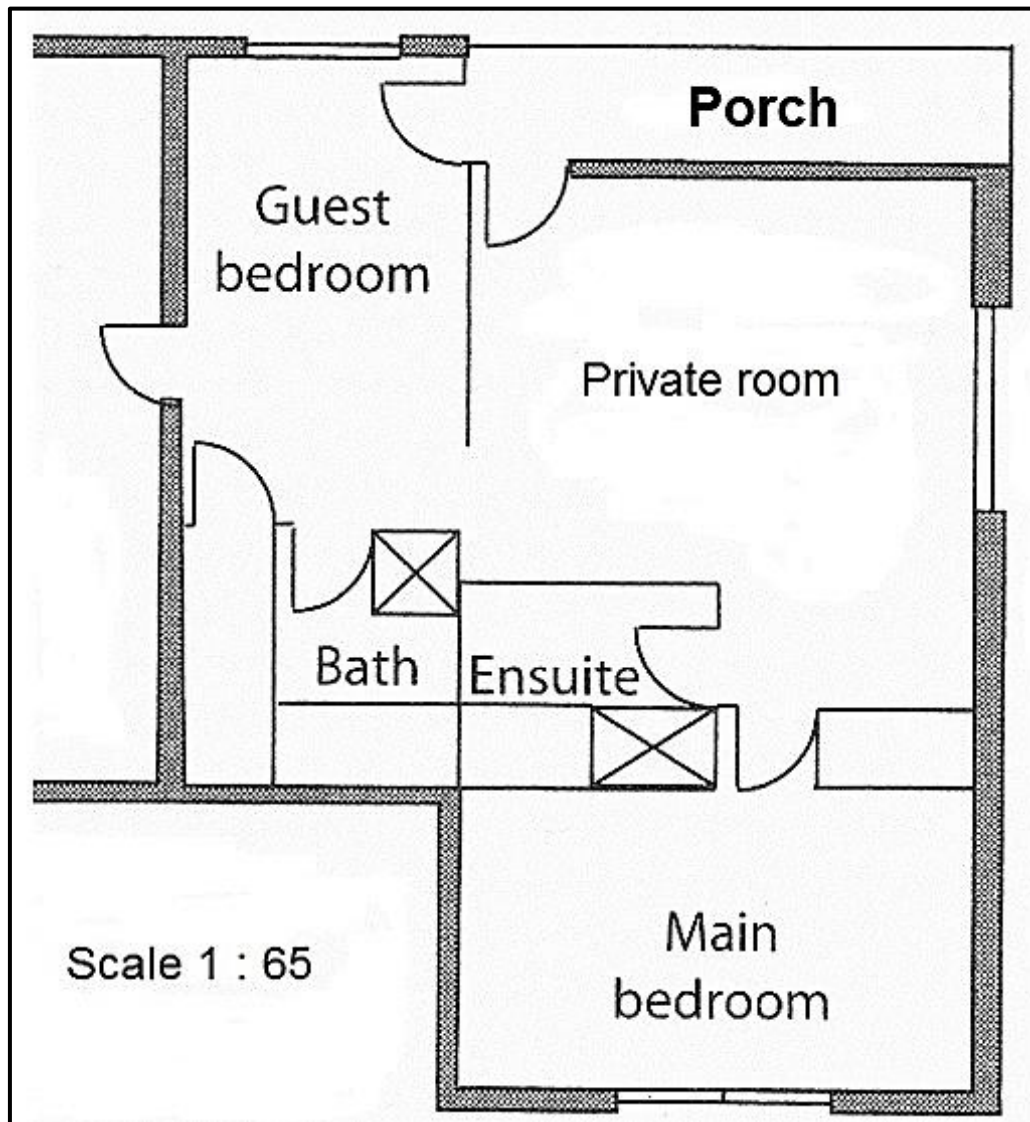
Study the box-and-whisker plot and answer the questions that follow.

- 1.3.1 What percentage of the people saves more than R65 per month? (2)
- 1.3.2 How many of the people saved less than R25 per month? (2)
- 1.3.3 Calculate the value of the inter-quartile range. (2)
- 1.3.4 Explain what is meant by the value of inter-quartile range calculated in QUESTION 1.3.3. (3)
- 1.3.5 Do you think the people in this area are serious about saving? Explain your answer. (3)

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QUESTION 2

- 2.1 Ms Harker asked a builder to draw a scale drawing of a proposed alteration to her house. The floor plan of the proposed alteration is shown below.



- 2.1.1 Measure the plan (dimensions) of the porch and calculate the actual dimensions of the porch in meters. (5)

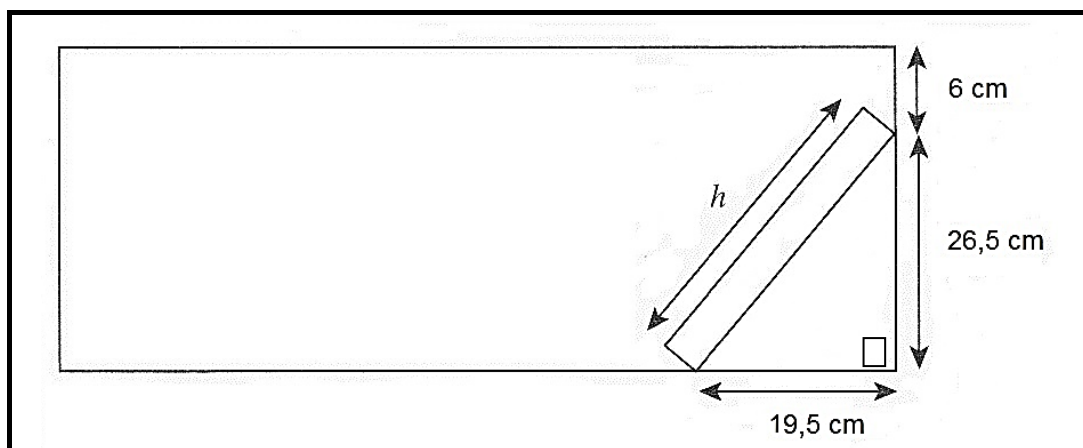
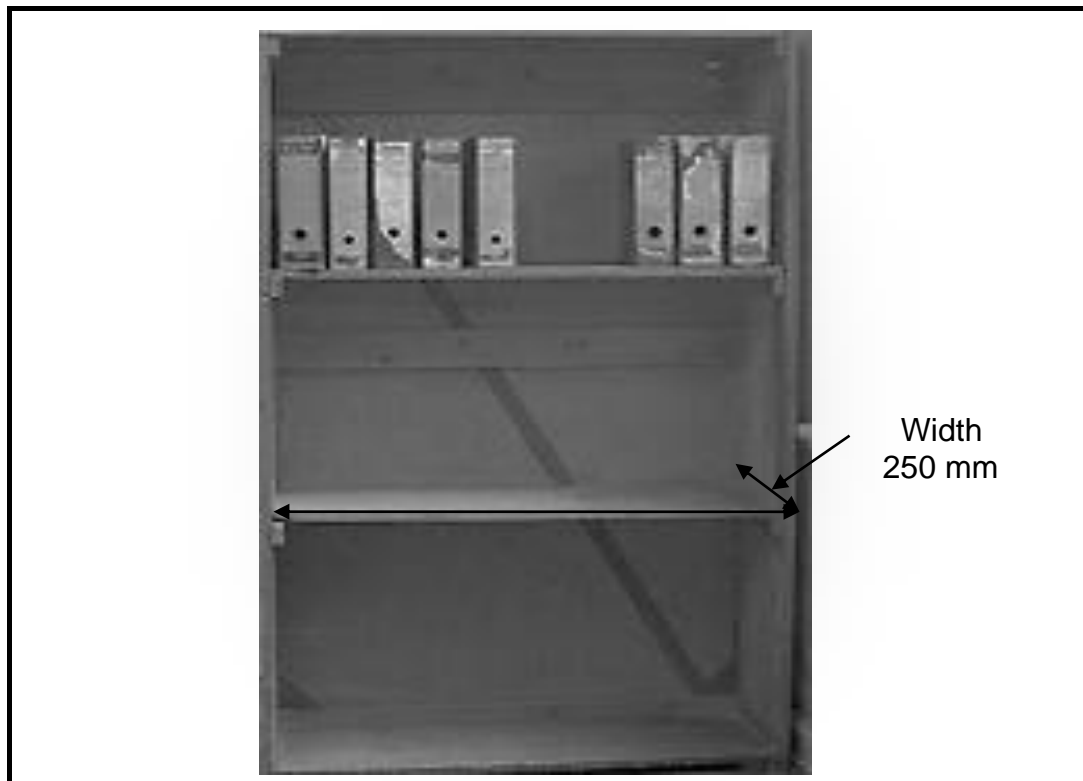
- 2.1.2 Ms Harker wants to have the porch laid with ceramic tiles which cost R79,99 per square metre. The tiler requests her to make allowance for 10% of the porch area for wastage and breakage in the laying of the tiles. If the tiler quotes R55 per square metre for labour, calculate the total cost for tiling the porch.

The following formula may be useful:

$$\text{Area} = \text{Length} \times \text{Breadth} \quad (8)$$

2.1.3 Study the plan carefully and write down TWO shortcomings that you would suggest to the builder to improve on the plan. (4)

2.2 In one of Ms Harker's other rooms in her house she has a bookshelf as shown below. Below the bookshelf is one of the shelves. Study these diagrams carefully before you answer the questions. These diagrams are not drawn to scale.



2.2.1 The total area of the shelves where the books are packed, is $0,45 \text{ m}^2$ and the width of one shelf is 250 mm. Calculate the length of ONE shelf in centimetres.

The following formula may be useful:

$$\text{Area} = \text{Length} \times \text{Breadth} \quad (5)$$

- 2.2.2 Hence, calculate the number of books that can be packed on the shelf if the books have a thickness of 23 mm. (3)
- 2.2.3 The maximum weight that one shelf can carry is 16 kilogram. If the average weight of one book on the top shelf is 1 493 gram, calculate the maximum number of books with this weight that can be packed on the top shelf. (3)
- 2.2.4 One of the books that Ms Harker has, cannot be placed upright (vertical) as shown in the top diagram, but it leans against the side of the shelf as shown in the bottom diagram. Show with the necessary calculations and explanations why it is impossible for the book to be positioned upright.

The following formula can be useful:

$$h^2 = o^2 + a^2$$

Where:

h = ***hypotenuse side***
o = ***opposite side and***
a = ***adjacent side***

(7)
[35]

QUESTION 3

- 3.1 Jano wants to buy a new car, but before he signs any contract, he wants to look at various options. He is interested in buying a Hyundai i30. He makes an appointment with a salesperson to show him the various options. The following table was presented to him.

Table 2

| | Option 1 Linked Rate | Option 2 Balloon Payment |
|--------------------------|---------------------------------|-------------------------------------|
| Cash Price | R165 000 | R165 000 |
| Deposit | R10 000 | R0 |
| Loan Amount | R156 140 | R166 140 |
| Interest Rate | 12% | 12% |
| Term of loan | 6 years | 6 years |
| Monthly repayment | R3 122,49 | R2 921,08 |
| Balloon Payment | R0 | 25% of cash price |

- * A compulsory once-off payment of R1 140,00 is payable.
- * A monthly administration fee of R57,00 is added to the monthly repayment.
- * A Balloon Payment is a final amount that is payable in the last month of the contract.

Study the above table and answer the questions that follow.

- 3.1.1 Show how the Loan Amount for Option 1 was calculated. (2)
- 3.1.2 Calculate the total amount that Jano will pay after the six years on Option 1. (3)
- 3.1.3 Calculate the total amount that Jano will pay after six years on Option 2. (4)
- 3.1.4 Calculate the difference between the amounts in QUESTION 3.1.2 and QUESTION 3.1.3. (2)
- 3.1.5 Explain why the monthly repayment of Option 2 is lower than that of Option 1 where a deposit has been paid. (2)
- 3.1.6 Jano needs some advice on which option to choose. Which of these two options will you advise Jano to choose? Give TWO reasons for your answer. (5)
- 3.1.7 The balloon payment option looks attractive, but it has some disadvantages for the buyer. Name TWO of the disadvantages of the balloon payment. (4)

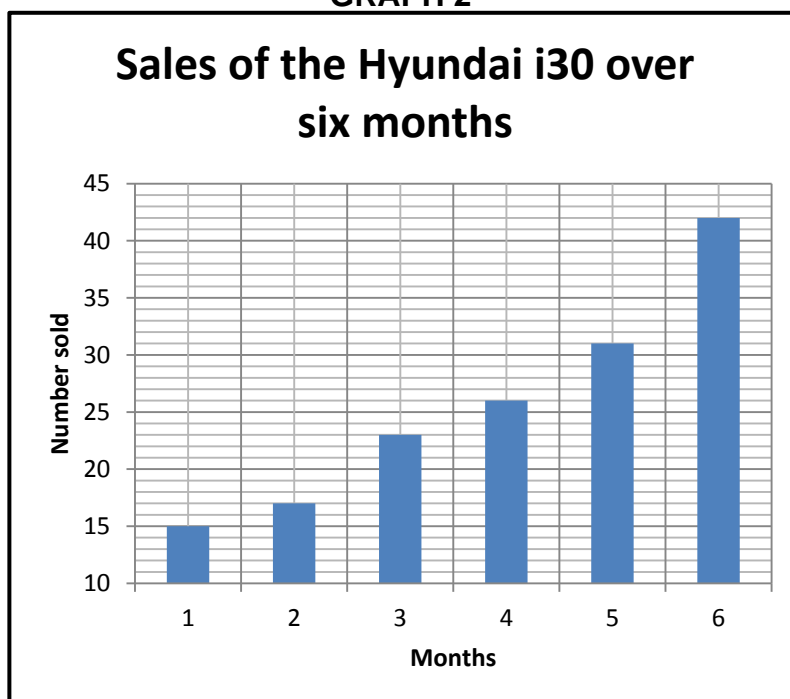
- 3.2 To convince Jano to buy the Hyundai i30, the salesperson presents to him two graphs regarding the sales of the Hyundai i30 over a period of six months.

Study the graphs and answer the questions that follow.

GRAPH 1



GRAPH 2



- 3.2.1 The salesperson made the following statement, "If you look at the two graphs, we sold 15 in the first month and it increased to 42 in month 6." Do you agree with this statement? Substantiate your answer with evidence from both graphs. (4)
- 3.2.2 Which ONE of the two graphs was the most appropriate graph to show to Jano? (2)

- 3.3 After Jano decided to buy the Hyundai i30, the salesperson asked him to choose a colour for his car. He was taken to their warehouse to look at the different colours they have in stock. In the warehouse they had different Hyundai models in different colours. The following table shows the various models and their colours.

| Model | Colours | | | | |
|-----------------|---------|-------|--------|-------|------|
| | Red | White | Silver | Black | Blue |
| Elantra | 3 | 0 | 1 | 2 | 5 |
| i10 | 2 | 3 | 1 | 3 | 4 |
| i20 | 1 | 4 | 2 | 3 | 4 |
| i30 | 4 | 5 | 3 | 5 | 6 |
| Sonata | 2 | 1 | 0 | 0 | 0 |
| Velostar | 1 | 0 | 0 | 1 | 0 |

- 3.3.1 How many Hyundai cars were in the warehouse? (2)
- 3.3.2 Which of the models do you think is the most popular? Give a reason for your answer. (3)
- 3.3.3 Calculate the probability that the colour of the Hyundai i30 that Jano will choose will be black. Express your answer as a percentage. (2)
- 3.3.4 Calculate the probability that Jano will not choose a black or a blue Hyundai i30. Express your answer to 3 decimal places. (3)
- 3.3.5 The salesperson claims that they sell twice the number of black Hyundai's than silver Hyundai's. Show with calculations whether you agree or disagree with the statement. (3)

[41]

QUESTION 4

- 4.1 Grant is a tour guide for Haven's Travel and Tours. He travels a daily distance of 700 km around the Johannesburg City Centre. He is only allowed to travel at a speed of 80 kilometres per hour. He is only allowed to take two breaks between 11h00 and 11h30, and again between 13h30 and 13h45.

ANNEXURE A shows map of the Johannesburg City Centre. Study the map carefully before answering the questions.

- 4.1.1 Calculate the time it will take Grant to complete the tour around the Johannesburg City Centre without any stops. Give your answer in hours and minutes. (3)
- 4.1.2 With the necessary calculations show at what time Grant should start his trip, if he wants to be home at 18h00. (3)
- 4.1.3 Grant is driving a vehicle with a tank capacity of 60 litres. If Grant's car is covering 7 kilometres on every litre of petrol, do you think that a full tank will last him for the tour? Show with the necessary calculations. (4)
- 4.1.4 In which direction must Grant travel if he wants to go through Smit Street (Blocks 1A)? Give a reason for your answer. (3)
- 4.1.5 Grant normally uses his Geographical Point System (GPS) to give him directions, but for some reason his GPS is dysfunctional. He is at the City Hall (Block 3B) and wants to go to the Planetarium (Block 1A). Give Grant detailed directions from the City Hall to the Planetarium. (4)
- 4.2 The speed limit in this area is 80 kilometres per hour. A traffic officer told Grant that drivers do not adhere to the speed limit. He showed Grant that he recorded the following speed for that specific day in two different areas (Braamfontein and Hillbrow). Use the data (speed in kilometre) below to answer the questions that follow.

Braamfontein – 81 ; 76; 95; 101, 99; 71; 85; 67;62

Hillbrow – 62; 83; 73; 77; 96; 99; 76; 68

- 4.2.1 The traffic officer said to Grant, that if one looks at the average speed of these two areas, then one can conclude that Braamfontein a high risk accident zone. Show by means of calculations whether you agree or disagree with the traffic officer's statement. (7)

- 4.2.2 Can the modal value be used to best describe the speed driven in one area? Give a reason for your answer. (2)
- 4.2.3 If you want to display these data graphically, which type of graph or graphs would you use to make a comparison between the two areas? (2)
- 4.2.4 If the traffic officer issued speeding fines to those who speeded, how many tickets did he issue for that specific day? (2)
- [30]**

TOTAL: 150

