higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(Second paper)

NQF LEVEL 4

(10401034)

6 November 2024 (X-paper)
09:00–12:00

Non-programmable calculators and mathematical instruments may be used.

This question paper consists of 10 pages and 2 answer sheets.

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MATHEMATICAL LITERACY
NQF LEVEL 4
(Second paper)
TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Clearly show all calculations.
5. Round off answers to TWO decimal places, unless stated differently.
6. Use π = 3,14. Students will be penalised if any other value is used.
7. Diagrams are not drawn to scale.
8. Answer QUESTION 3.1.8 on ANSWER SHEET A (attached). Write your EXAMINATION and CENTRE NUMBER in the spaces provided. Detach the ANSWER SHEET from the question paper and hand it in with the ANSWER BOOK.
9. Answer QUESTION 4.1.8 on ANSWER SHEET B (attached). Write your EXAMINATION and CENTRE NUMBER in the spaces provided. Detach the ANSWER SHEET from the question paper and hand it in with the ANSWER BOOK.
10. Only use a black or blue pen.
11. Write neatly and legibly.

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QUESTION 1

1.1 Jenna wants to purchase an automatic washing machine for her new home. The store offers Jenna two payment options:

Option A: Cash price of R6 399,99 (VAT inclusive).
Option B: Deposit of R640,00 plus 24 monthly instalments of R520,00.

1.1.1 Calculate the cash price of the washing machine before VAT was added. (3)

1.1.2 Show, by means of calculations, that the deposit amount for Option B is 10% of the cash price. (2)

1.1.3 Calculate how much more Jenna will pay for the washing machine if she chooses Option B. (5)

1.1.4 Give ONE reason why Jenna would choose Option B instead of Option A. (2)

1.2 Jenna wants to purchase washing powder for the washing machine. Smart Save Wholesalers has the following cost options:

Option A: A 750 g packet of Brights automatic washing powder at R62,64.
Option B: A 1,8 kg packet of Rainbow automatic washing powder at R145,90.

1.2.1 Which option is cheaper per kg? Show all calculations. (5)

1.2.2 Smart Save Wholesalers offers a 5% discount on the purchase of a 1,8 kg packet of Rainbow automatic washing powder to customers that have a Smart Save shopper card.

Calculate the discount, in rand, that customers with Smart Save shopper cards will receive when purchasing this washing powder. (2)

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1.3 Study the tax rate table given below and answer the questions that follow.

RATES OF TAX FOR INDIVIDUALS: 01 MARCH 2023 – 29 FEBRUARY 2024	
Taxable Income (R)	**Rates of Tax (R)**
1 – 237 100	18% of taxable income
237 101 – 370 500	42 678 + 26% of taxable income above 237 100
370 501 – 512 800	77 362 + 31% of taxable income above 370 500
512 801 – 673 000	141 275 + 36% of taxable income above 512 800
673 001 – 857 900	179 147 + 39% of taxable income above 673 000
857 901 – 1 817 000	251 258 + 41% of taxable income above 857 900
1 817 001 and above	644 489 + 45% of taxable income above 1 817 000

TAX REBATES: 01 MARCH 2023 – 29 FEBRUARY 2024	
Primary (Persons under 65)	R17 235
Secondary (Persons 65 and under 75)	R 9 444
Tertiary (Persons 75 and over)	R 3 145

TAX THRESHOLD: 01 MARCH 2023 – 29 FEBRUARY 2024	
Primary (Persons under 65)	R95 750
Secondary (Persons 65 and under 75)	R148 217
Tertiary (Persons 75 and over)	R165 689

[Source: *www.sars.gov.za*]

1.3.1 Jenna is 66 years old and earns a monthly taxable income of R27 430. Calculate her monthly PAYE. (10)

1.3.2 Jenna is promoted at work and her annual taxable income increases to R403 647. Will Jenna's PAYE increase? Use the tax table provided to justify your answer. (2)

1.3.3 What does PAYE stand for? (1)

1.3.4 Jenna's husband, Sam, is 73 years old and earns a monthly taxable income of R8 572. He claims that he is not eligible to pay monthly tax.

Is Sam's claim valid? Justify your answer and show all calculations. (4)

1.4 Jenna was selected as a top employee in 2023 and received a monetary award of R10 000. She invested the money at an interest rate of 7,5%, compounded annually, for a period of two years.

Calculate the final investment amount and show, by means of calculations, that the interest earned on the investment was R1 556,25. (7)

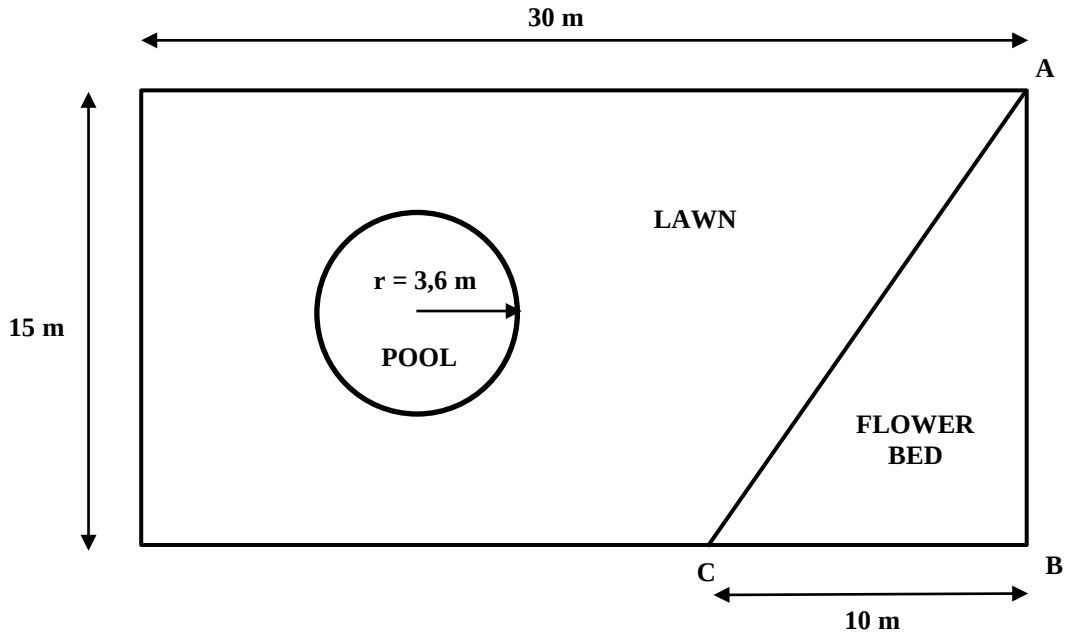
[43]

QUESTION 2

2.1 Sive designs his rectangular garden with a circular swimming pool and a triangular flower bed. He plants lawn in the entire garden, excluding the swimming pool and the flower bed. Refer to the diagram of the garden below and answer the questions that follow.

The diagram is NOT drawn to scale.

RECTANGULAR GARDEN WITH FLOWER BED AND SWIMMING POOL



2.1.1 The capacity of the circular swimming pool is 73 250 litres. Calculate the depth of the circular swimming pool.

Volume of cylinder: $V = \pi \times r^2 \times h$, where $\pi = 3{,}14$.
Hint: ($1\ m^3 = 1\ 000$ litres) (5)

2.1.2 Sive stated that the area of the lawn is 334,31 m^2. Show, by means of calculations, that his statement is correct.

Area of a rectangle: $A = L \times B$
Area of a triangle: $A = \frac{1}{2} \times \text{base} \times h$
Area of a circle: $A = \pi \times r^2$ (where $\pi = 3{,}14$) (8)

2.1.3 Sive wants to place a wooden fence (line AC) between the flower bed and the lawn. Wooden fencing costs R306/m and the delivery charge is R150,00.

Calculate the total cost of fencing, including the delivery charge.

Theorem of Pythagoras: $AC^2 = AB^2 + BC^2$ (7)

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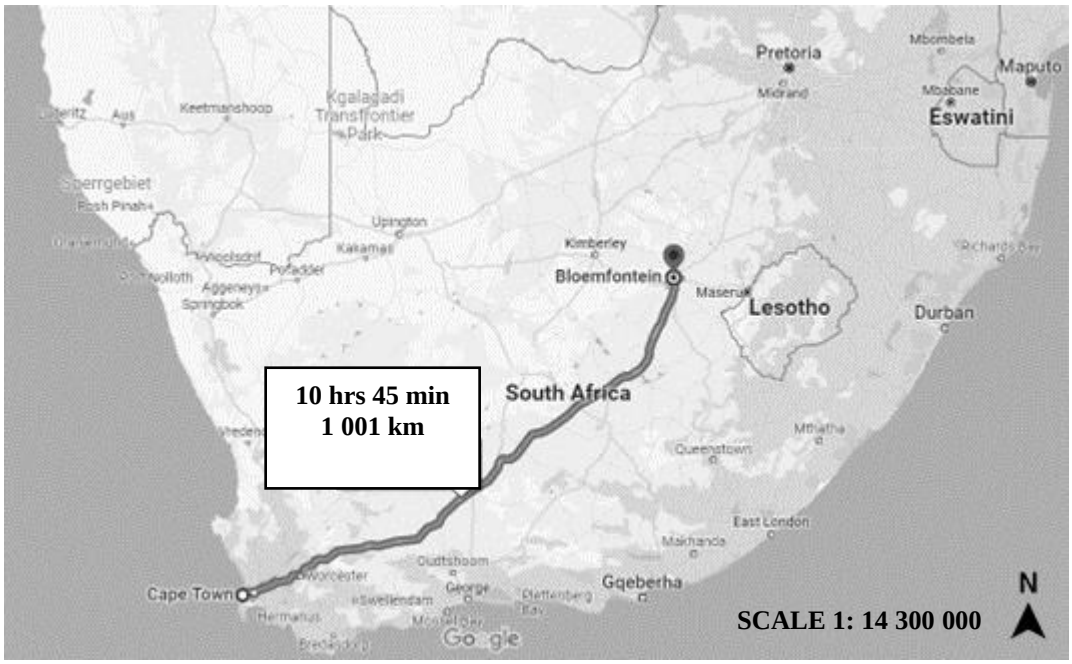
2.2 Sive travelled by car from Cape Town to Bloemfontein. Study the map below and answer the questions that follow.

The map is NOT drawn to scale.



[Source: *https://www.google.com/maps/dir/Cape+Town/Bloemfontein/*]

2.2.1 What is the compass direction of Cape Town from Bloemfontein? (2)

2.2.2 Explain the scale of the map. (2)

2.2.3 The measurement on the map between Cape Town and Bloemfontein, as the crow flies, is 7 cm. Show, by means of calculations, that the actual distance between these towns is 1 001 km. (3)

2.2.4 Calculate the average speed of a vehicle, in km/h, travelling from Cape Town to Bloemfontein.

Speed = Distance ÷ Time (5)

2.2.5 The journey from Cape Town to Bloemfontein is 1 001 km. Calculate the cost of a return journey if the average petrol consumption of Sive's car is 7,5 litres per 100 km and if petrol costs R22,95 per litre. (6)

[38]

QUESTION 3

3.1 A housing complex requires plumbing services. The body corporate of the housing complex considers the cost options for labour, excluding materials, of two plumbing companies.

Note: A body corporate is a collective name given to all the owners of the units in the housing complex.

Plumb Fast: A flat rate of R520 per hour for labour.
Quick Fix: A call-out fee of R350 plus R450 per hour for labour.

The table below shows the relationship between the number of hours and the cost (in rand) for plumbing services by Plumb Fast and Quick Fix.

Number of hours	1	2	3	4	5	9
Plumb Fast Cost (In rand)	520	1 040	**A**	2 080	2 600	4 680
Quick Fix Cost (In rand)	800	1 250	1 700	**B**	2 600	4 400

3.1.1 Identify the plumbing company with lower variable costs. (1)

3.1.2 Calculate the missing values in the table above.

(a) A
(b) B

(2 × 1) (2)

3.1.3 Name and describe the relationship between the number of hours and the cost (in rand) for Plumb Fast. (3)

3.1.4 Write a formula for the cost (in rand) of plumbing services for Plumb Fast. (2)

3.1.5 Write a formula for the cost (in rand) of plumbing services for Quick Fix. (3)

3.1.6 Calculate the difference in the cost between the companies for 12 hours of plumbing services. (7)

3.1.7 The housing complex consists of 20 units. Each unit requires three hours of plumbing services.

Which plumbing company will be the cheapest? Show all calculations. (7)

3.1.8 Draw a line graph on ANSWER SHEET A (attached) to show the relationship between the number of hours and the cost (in rand) of Quick Fix. The line graph of Plumb Fast has already been drawn.
Label both axes and label the graph. (6)

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3.2 Quick Fix was employed to complete the plumbing services at the housing complex.

3.2.1 Five plumbers completed the job in 2 days. Show, by means of calculations, that eight plumbers would have taken 1,25 days to complete the job. (2)

3.2.2 Name the dependent variable. Give a reason for your answer. (2)

[35]

QUESTION 4

4.1 The Governance, Public Safety and Justice Survey (GPSJS) reports released by Statistics SA indicate that housebreaking is one of the most common crimes that affect South African households.

Refer to the data in the table below on the housebreaking incidents during the 2019/2020 and the 2020/2021 periods in the provinces of South Africa and answer the questions that follow.

PROVINCE	HOUSEBREAKING INCIDENTS (2019/2020)	HOUSEBREAKING INCIDENTS (2020/2021)
North West	15 000	50 000
Northern Cape	17 000	19 000
Free State	36 000	12 000
Limpopo	55 000	42 000
Mpumalanga	63 000	67 000
Eastern Cape	92 000	77 000
Western Cape	109 000	132 000
KwaZulu-Natal	214 000	172 000
Gauteng	260 000	238 000

[Adapted from: *https//www.statssa.gov.za*]

4.1.1 What is the sample size of each data set? (1)

4.1.2 Which province had the highest number of housebreaking incidents in both periods? (1)

4.1.3 Which province had between 15 000 and 20 000 housebreaking incidents in both periods? (1)

4.1.4 Calculate the range of the number of housebreaking incidents that occurred in South Africa in the 2020/2021 period. (2)

4.1.5 Show, by means of calculations, that the percentage increase in the number of housebreaking incidents in the Western Cape, from the 2019/2020 period to the 2020/2021 period was 21,10%. (3)

4.1.6 Calculate the mean of the housebreaking incidents in the 2019/2020 and 2020/2021 periods. (4)

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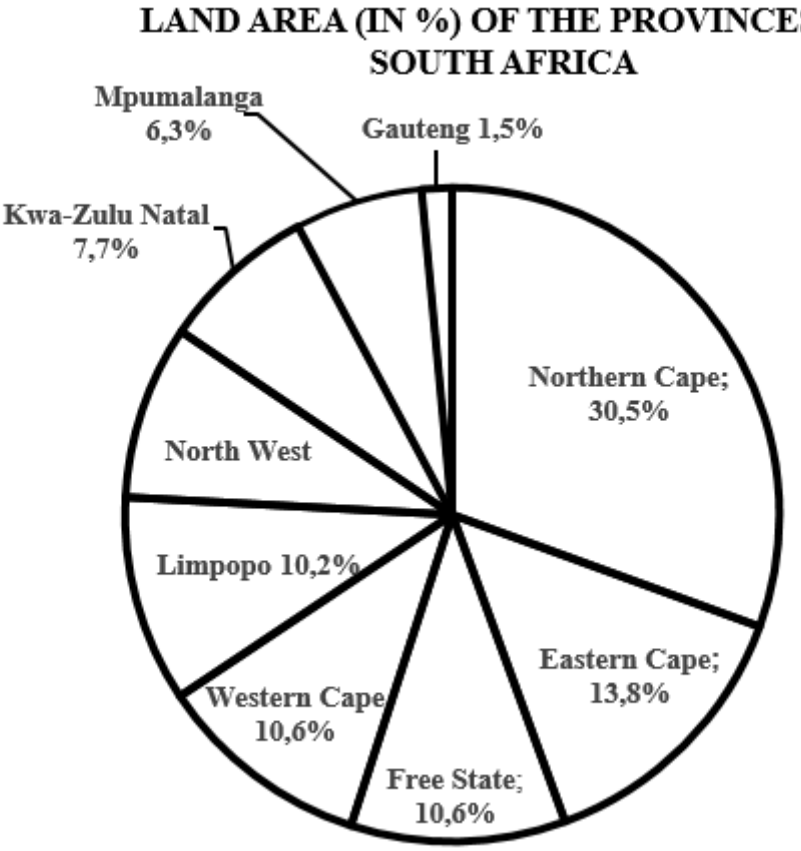
4.1.7 Calculate the median of the housebreaking incidents in the 2020/2021 period. (2)

4.1.8 Draw a vertical double bar graph on ANSWER SHEET B (attached) to compare the number of housebreaking incidents that occurred in the 2019/2020 and 2020/2021 periods in the following provinces:
North West, Northern Cape, Free State, Limpopo, and Mpumalanga.

Label both axes. (7)

4.2 Refer to the pie chart below which shows the land area, in percentage, of each province in South Africa and answer the questions that follow.



[Source: *http://www.globalsmes.org/news/index*]

4.2.1 Calculate the percentage of the land area in North West province. (3)

4.2.2 Calculate the angle size (in degrees) of the section of the pie chart that represents the Eastern Cape. (3)

4.2.3 The land area of the Eastern Cape is 168 966 square km.

Calculate the total land area of South Africa in square km. (3)

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4.3 A survey was conducted at a cafeteria to identify the preferences that male and female students had for soft drinks.

Study the table below and answer the questions that follow.

STUDENTS	COKE	FANTA	TOTAL
Male	40	23	63
Female	55	42	97
TOTAL	95	65	160

4.3.1 Determine the probability of randomly selecting a male student from the group that prefers Fanta. Write your answer as a fraction. (2)

4.3.2 Determine the probability of randomly selecting a student from the group that prefers Coke. Write your answer as a decimal. (2)

[34]

TOTAL: 150

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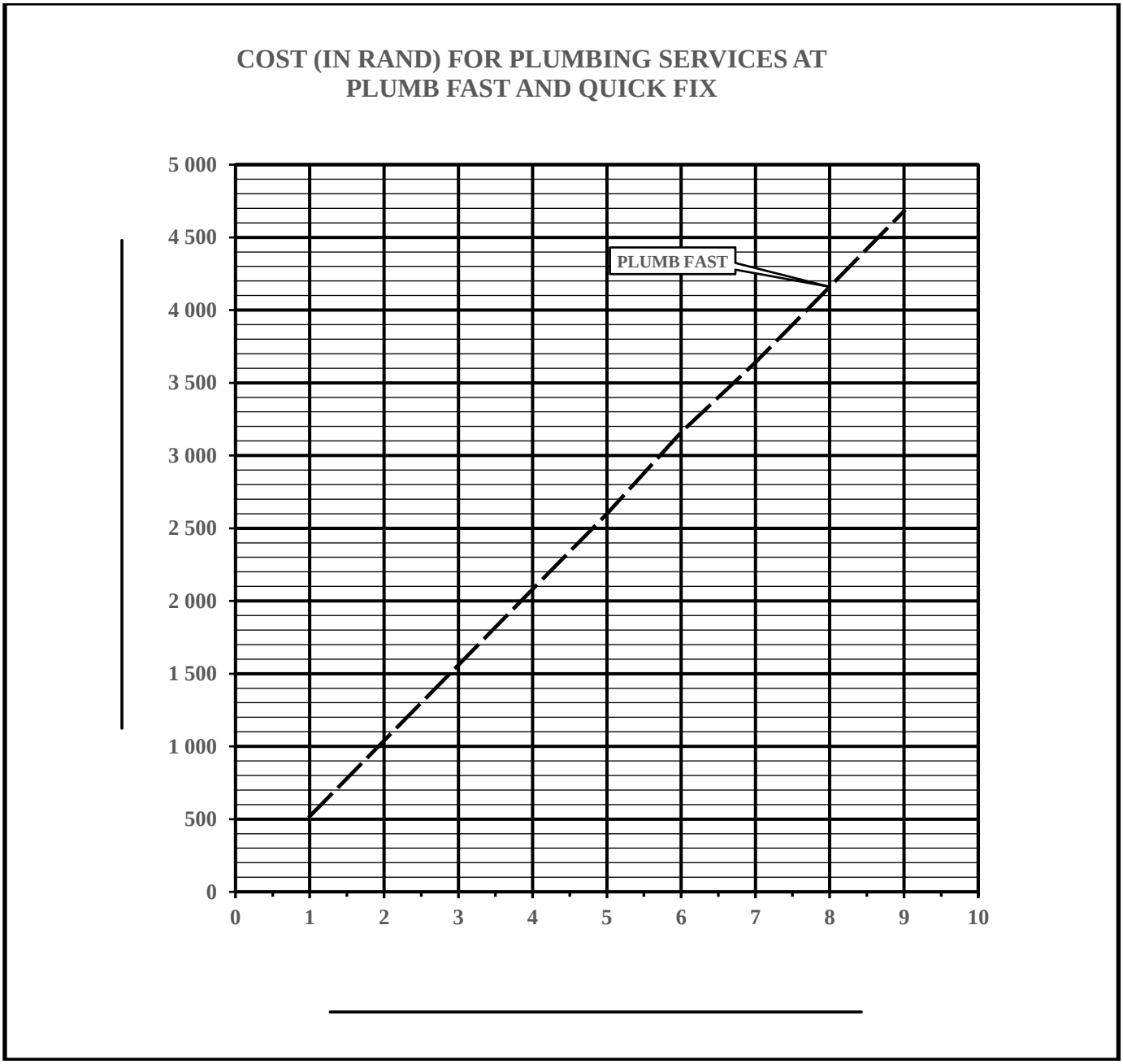
ANSWER SHEET A

EXAMINATION NUMBER: | | | | | | | | | | | | | |

CENTRE NUMBER: | | | | | | | | | | |

Hand in with the ANSWER BOOK.

QUESTION 3.1.8



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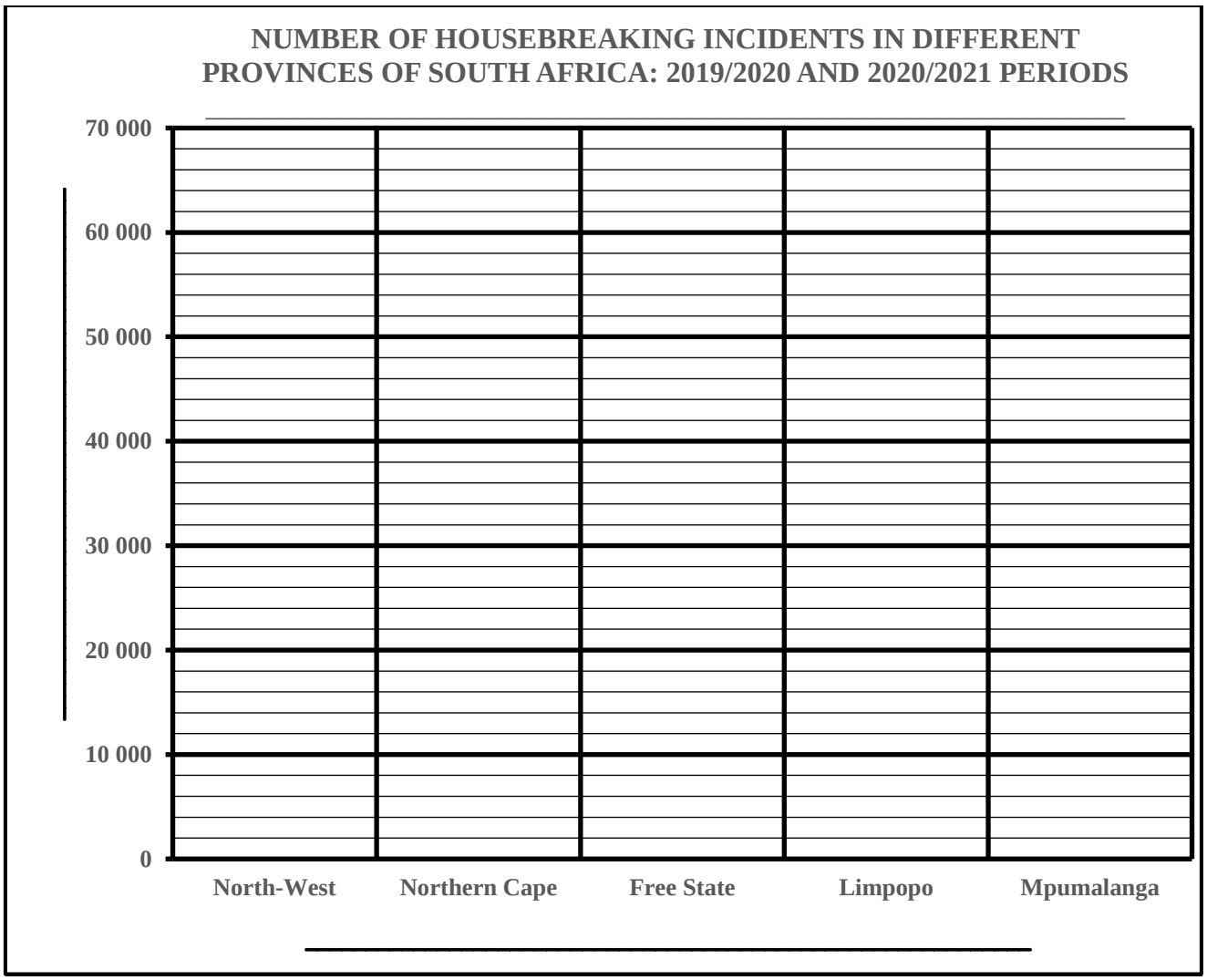
ANSWER SHEET B

EXAMINATION NUMBER: | | | | | | | | | | | | | |

CENTRE NUMBER: | | | | | | | | | | | |

Hand in with the ANSWER BOOK.

QUESTION 4.1.8



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