KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

PREPARATORY EXAMINATION

SEPTEMBER 2022

MARKS: 150

TIME: 3 hours

This question paper consists of 14 pages including 1 answer sheet and an Addendum with 1 Annexure.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.

2. 2.1 Use ANNEXURE A in the ADDENDUM to answer QUESTION 2.2.

   2.2 Answer QUESTION 5.1.2. on the attached ANSWER SHEET.

   2.3 Write your name in the spaces provided on the ANSWER SHEET. Hand in the ANSWER SHEET with your ANSWER BOOK.

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

6. Show ALL calculations clearly.

7. Round off ALL final answers appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.

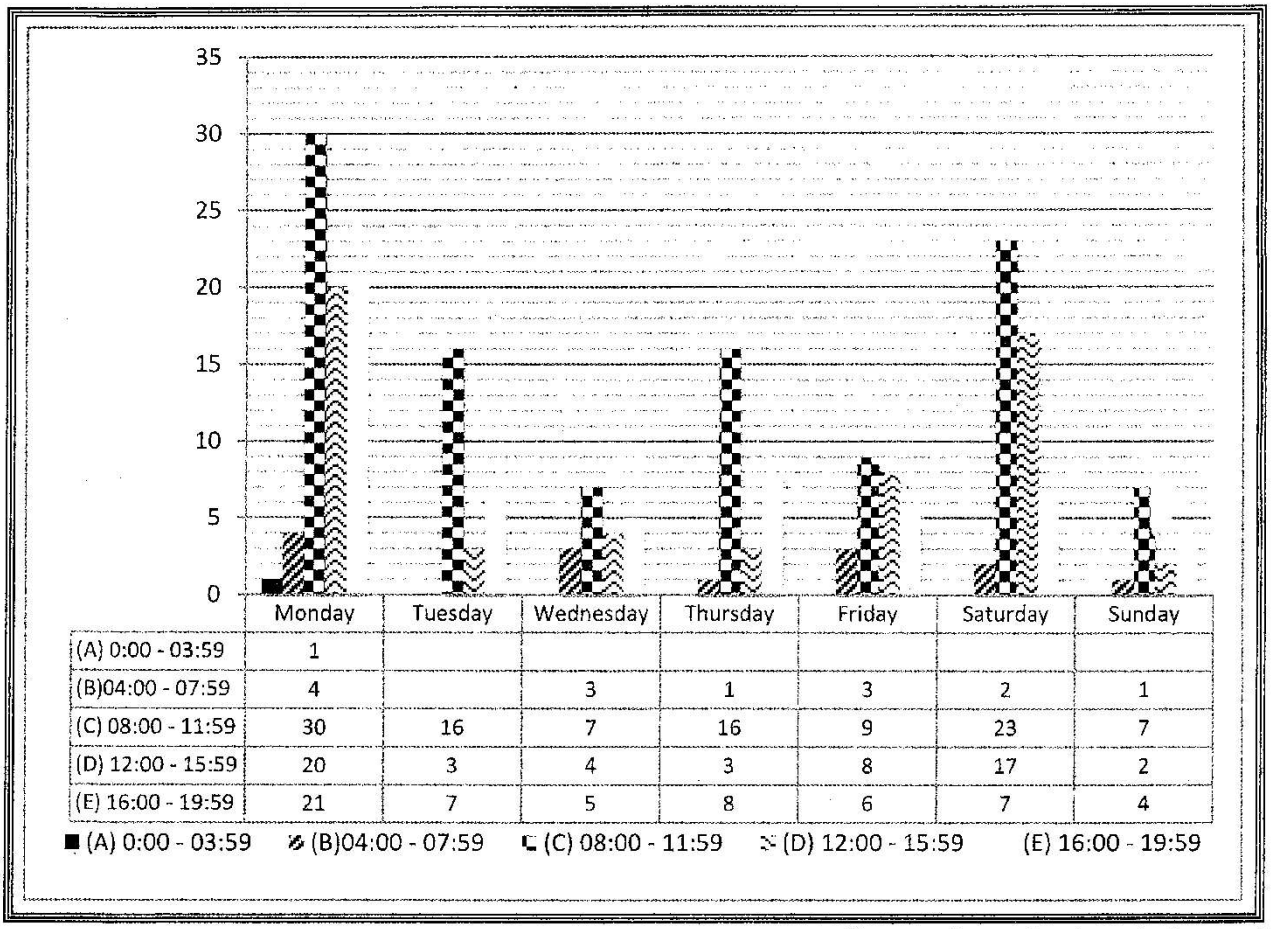
10. Write neatly and legibly.

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QUESTION 1

1. Cash-in-transit robberies are a serious problem in South Africa. The graph below shows the days and times when robberies are committed.

ROBBERY OF CASH-IN-TRANSIT: DAYS AND TIMES OF THE WEEK



	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
(A) 0:00 - 03:59	1						
(B)04:00 - 07:59	4		3	1	3	2	1
(C) 08:00 - 11:59	30	16	7	16	9	23	7
(D) 12:00 - 15:59	20	3	4	3	8	17	2
(E) 16:00 - 19:59	21	7	5	8	6	7	4

Source: [www.businesstech.co.za]

Use the graph and the table above to answer the questions that follow.

1.1.1 Identify which day of the week had the greatest number of robberies. (2)

1.1.2 Calculate the total number of robberies that occurred on Saturday. (2)

1.1.3 Determine how many robberies occurred from 8:00 – 11:59 on Thursday. (2)

1.1.4 Calculate the difference between the highest and the lowest number of robberies that occurred on a Monday. (2)

1.1.5 Write down the time interval that had the highest number of robberies throughout the week. (2)

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1.2 The School Governing Body of Green Fields High School approved 2022 annual school fees of R17 500 which includes a 10% increase from 2021 school fees. If the annual fees are paid by March 2022 there will be a discount equivalent to the percentage increase in the school fees.

Use the information above to answer the questions that follow.

1.2.1 Write down the percentage discount given to those who fully paid the school fees in March. (2)

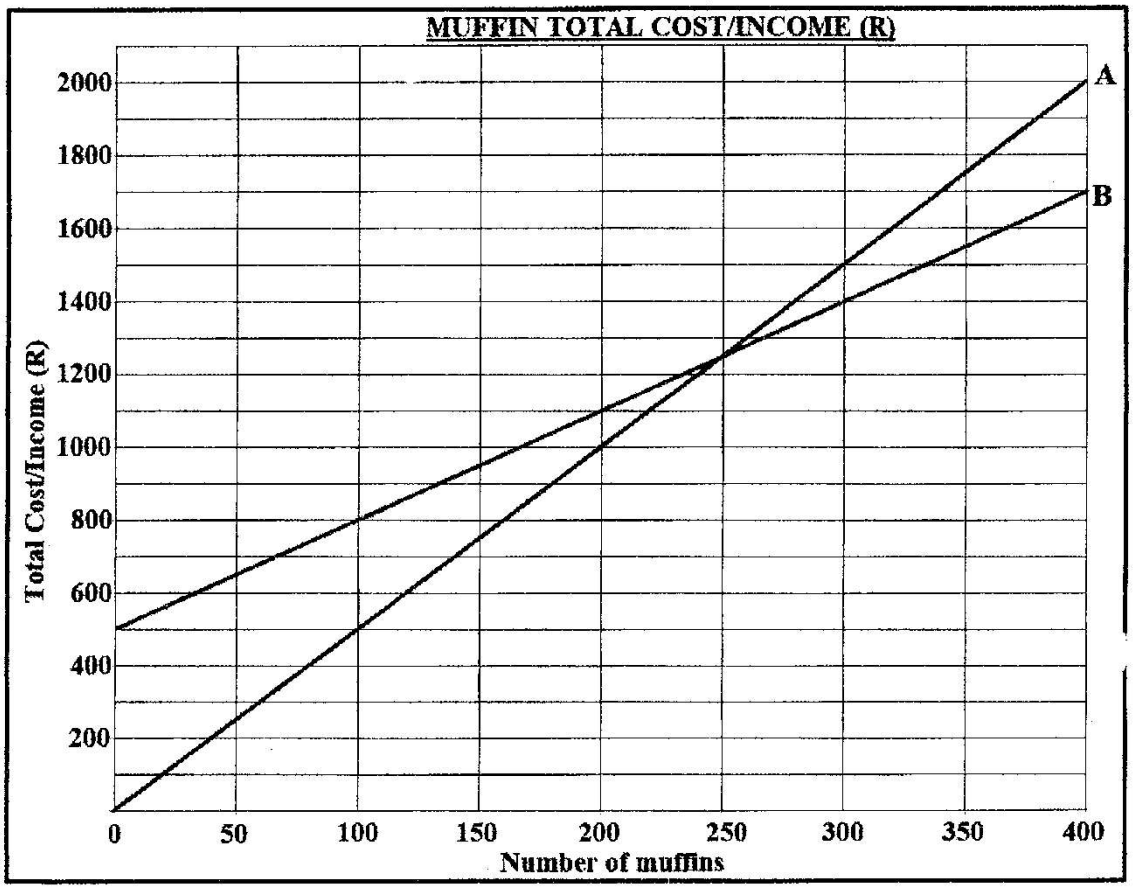
1.2.2 Calculate the annual school fees for 2021 rounded off to the nearest R1. (2)

1.2.3 Lerumo's parents chose the ten equal monthly payments option in 2022. Calculate their monthly payment. (2)

1.2.4 If the 2021 school fees was R15 909 and increased to R17 500 in 2022, calculate the increase in the school fees. (2)

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1.3 Green Fields High School Matric Dance Committee bakes and sells muffins to raise funds for the matric dance. Given below is the graph for total cost and total income for the muffins.



Use the graph above to answer the questions that follow.

1.3.1 Explain the meaning of the word "*total cost*" in the context above. (2)

1.3.2 State what each of the line graphs **A** and **B** represent. (2)

1.3.3 Write down the fixed cost. (2)

1.3.4 Determine the cost for baking 300 muffins. (2)

1.3.5 Calculate the selling price for each muffin. (2)

1.3.6 Write down the number of muffins to be sold to break-even. (2)

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QUESTION 2

2.1 Umlalazi Municipality published the financial statements for 2020 and 2021 for the different votes or departments labelled Vote 1 to Vote 13 as shown in TABLE 1 below.

TABLE 1: FINANCIAL PERFORMANCE OF DEPARTMENTS/VOTES

VOTE	2020		2021	
	REVENUE R thousands	EXPENDITURE R thousands	REVENUE R thousands	EXPENDITURE R thousands
Vote 1	204 409	78 556	156 335	28 211
Vote 2	66 587	50 753	47 441	27 564
Vote 3	-	2 595	-	1 236
Vote 4	5 290	17 659	151	9 310
Vote 5	26	16 982	20	9 515
Vote 6	3	11 932	2	6 120
Vote 7	37 687	39 052	37 830	38 515
Vote 8	2 765	12 125	1 685	8 013
Vote 9	39 666	101 502	15 866	51 716
Vote 10	15 532	27 294	8 207	13 299
Vote 11	78 899	81 680	37 022	38 481
Vote 12	-	4	-	0
Vote 13	-	365	-	9
TOTAL	**450 864**	-		
SURPLUS/DEFICIT	**10 365**		**C**	

[Adapted from www.umlalazi.gov.za]

Study TABLE 1 above and answer the questions that follow.

2.1.1 Explain the term *"surplus"* in this context. (2)

2.1.2 Show how the 2020 surplus of R10 365 was calculated. (3)

2.1.3 One councillor stated that the percentage difference in the expenditure for Vote 13 from 2020 to 2021, was greater than –29%. Use calculations to verify the statement.

You may use the formula:

$$\% \textbf{ difference} = \frac{\textbf{2021 expenditure} - \textbf{2020 expenditure}}{\textbf{2020 expenditure}} \times \textbf{100}\% \quad (4)$$

2.1.4 If a vote is picked at random, what is the probability that its expenditure for 2021 is greater than R27 000 000? Write your answer as a percentage. (3)

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2.2 Dream Big High School received an electricity account statement for the school from uMlalazi Municipality. ANNEXURE A is an extract of the account statement with some values and amounts left out.

Use ANNEXURE A to answer the following questions.

2.2.1 Explain the term *"opening balance"* in this context. (2)

2.2.2 Show, using the meter readings that the value of **D** is 15 012. (2)

2.2.3 Calculate the missing value **E**. (2)

2.2.4 Use calculations to verify if the VAT amount of R4 374,81 was calculated correctly. (4)

2.3 Mr Mdletshe is 68-year-old businessman, married with three grand children who are also covered by his medical aid. As a company director, Mdletshe earns a monthly income of R42 000 and donates R2 500 every month to a local Orphanage. TABLE 2 below shows Individual Income Tax Rates for 2022.

N.B: Donations by natural persons not exceeding R100 000 are allowable tax ded .ions.

TABLE 2: INDIVIDUAL INCOME TAX RATES – 2022

Taxable income (R)	**Rates of tax (R)**
1 – 226 000	18% of taxable income
226 001 – 353 100	40 680 + 26% of taxable income above 226 000
353 101 – 488 700	73 726 + 31% of taxable income above 353 100
488 701 – 641 400	115 762 + 36% of taxable income above 488 700
641 401 – 817 600	170 734 + 39% of taxable income above 641 400
817 601 – 1 731 600	239 452 + 41% of taxable income above 817 600
1 731 601 and above	614 192 + 45%% of taxable income above 1 731 600
Rebates	
Primary Rebate (Persons under 65)	R15 714
Secondary Rebate (Persons 65 and under 75)	R24 327
Tertiary Rebate (Persons 75 and over)	R27 198
Medical Aid Tax Credits	
Main member	R332
First dependant	R332
For each additional dependant	R224

[Adapted from www.sars.gov.za]

Use TABLE 2 and the information above to answer the questions that follow.

2.3.1 Calculate:

(a) Mdletshe's annual taxable income. (3)

(b) annual medical tax credits. (4)

2.3.2 Mr Mdletshe claims that his tax is not more than R4 500. Verify his claim. (9)

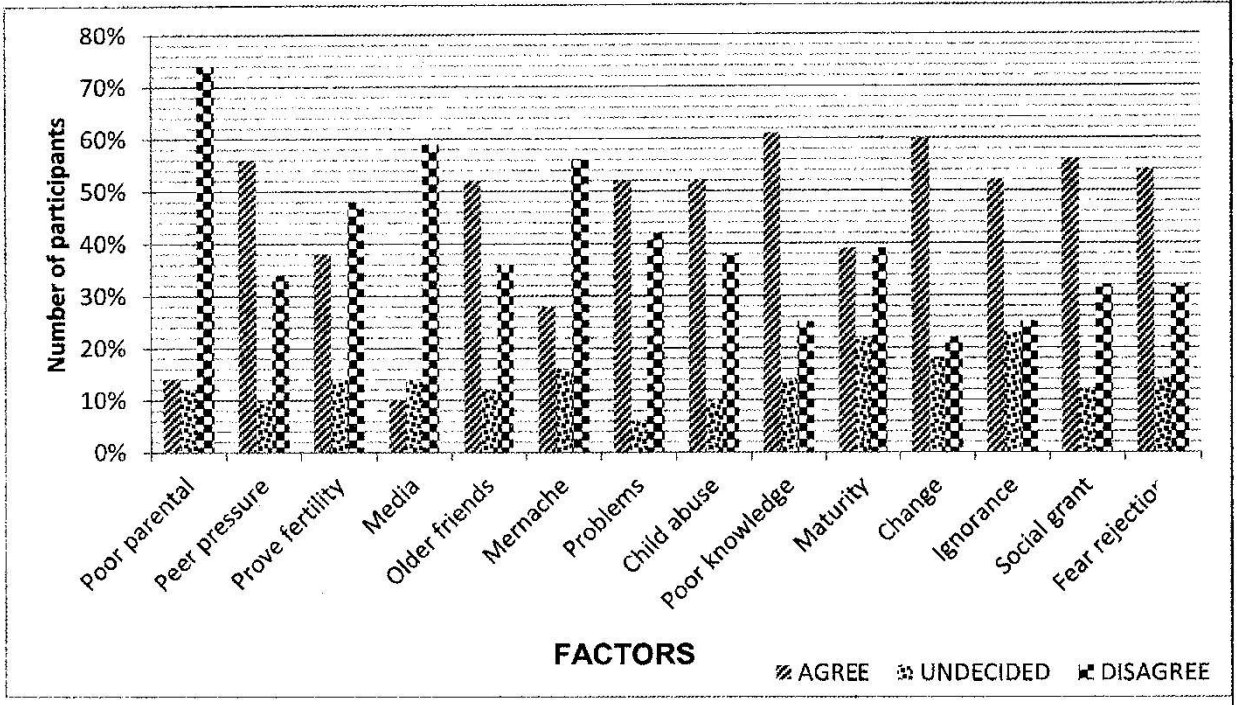
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QUESTION 3

3.1 A survey was conducted to try and identify factors that influenced adolescent pregnancy rate in the Greater Giyane Municipality, Limpopo Province. The results are shown in the graph below.

FACTORS INFLUENCING ADOLESCENT PREGNANCY IN GREATER GIYANE



[Adapted from www.sciencedirect.com]

Use the graph and the given information above to answer the questions that follow.

3.1.1 Define the term '*mode*' in this context. (2)

3.1.2 State whether the data shown above is discrete or continuous. (2)

3.1.3 Identify the type of graph shown and state one possible reason why the graph was chosen to display the data. (2)

3.1.4 Which factor has the greatest influence on adolescent pregnancy in Greater Giyane? (2)

3.1.5 If the data was collected from a sample of 150 girls from 4 schools, calculate the number of girls who disagreed with "poor parental" as a factor. (2)

3.1.6 Give one disadvantage of the mean. (2)

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3.2 TABLE 3 below shows the 2020 and 2021 matric results for each of the nine provinces in South Africa.

TABLE 3: PROVINCIAL MATRIC PASS RATES FOR 2020 AND 2021

PROVINCES	PASS RATE IN YEARS		
	2020	2021	PERCENTAGE DIFFERENCE
FREE STATE	85,1%	85,7%	0,6%
GAUTENG	83,3%	82,8%	-0,5%
WESTERN CAPE	79,9%	81,2%	1,3%
NORTH WEST	76,2%	78,2%	2,0%
KWAZULU-NATAL	77,6%	76,8%	**F**
MPUMALANGA	73,7%	73,6%	-0,1%
EASTERN CAPE	68,1%	73,0%	4,9%
NORTHERN CAPE	66,0%	71,4%	5,4%
LIMPOPO	68,2%	66,7%	-1,5%

[Adapted from www.insideeducation.co.za]

Use the information and the TABLE 3 above to answer the questions that follow.

3.2.1 Calculate the missing value **F**. (2)

3.2.2 Determine the median percentage difference. (3)

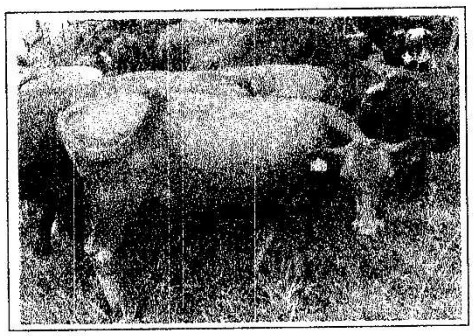
3.2.3 Calculate the country's mean percentage pass rate for 2021. (4)

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QUESTION 4

4.1 In the Zulu culture the bride groom is expected to pay lobola by sending 11 cows to the bride's family. Siyacela invested R60 000 at the end of December 2018 at 9,8% per annum simple interest to raise money for lobola.

He hopes to pay lobola end of December 2024. On average the current (2022) cost of a lean cow is R8 500. The projected livestock inflation rates for 2023 and 2024 are 11,8% and 9% respectively.



[Adapted from www.ultralyx.com]

Use the given information above to answer the questions that follow.

4.1.1 Calculate manually the total interest earned on the investment will be at the end of 2024. (4)

4.1.2 Use the projected livestock inflation rates to calculate the cost of each lean cow in 2024. (7)

4.1.3 Show with calculations whether Siyacela will have enough money to buy the 11 cows in 2024. (5)

4.1.4 Siyacela's sister wants to donate $1 450 to assist him with lobola. This amount is equivalent to R21 117,51. Determine the exchange rate in the form: **$1 = R ...** (2)

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4.2 People prefer to buy lean cows because they are cheaper. The buyer will have to feed them for a certain period of time. The frequency table below shows the masses of lean cows in a nearby cattle farm.

TABLE 4: MASSES OF LEAN COWS IN KILOGRAMS

INTERVAL (KG)	FREQUENCY	CUMULATIVE FREQUENCY
220 – 229	15	15
210 – 219	28	43
200 – 209	9	52
190 – 199	12	64
180 – 189	7	71
170 – 179	10	81
160 – 169	20	101
159 – 159	7	108
140 – 149	11	119
130 – 139	4	123
120 – 129	2	125

Use the TABLE 4 above to answer the following questions.

4.2.1 Which statistical cycle stage is shown by the table above? (2)

4.2.2 Determine the number of cows that weighed less than 170 kg. (2)

4.2.3 Calculate the percentage of cows that weigh more than 180 kg. (3)

4.3 The two-way table below shows the Mathematical Literacy test results from 1 550 learners in one of the districts in KZN.

TABLE 5: MATHEMATICAL LITERACY TEST RESULTS

	PASS	FAIL	TOTALS
BOYS	350	**G**	460
GIRLS	820	270	**H**
TOTALS	1 170	380	1 550

Use TABLE 5 above to answer the questions that follow.

4.3.1 Calculate the missing values of **G** and **H**. (4)

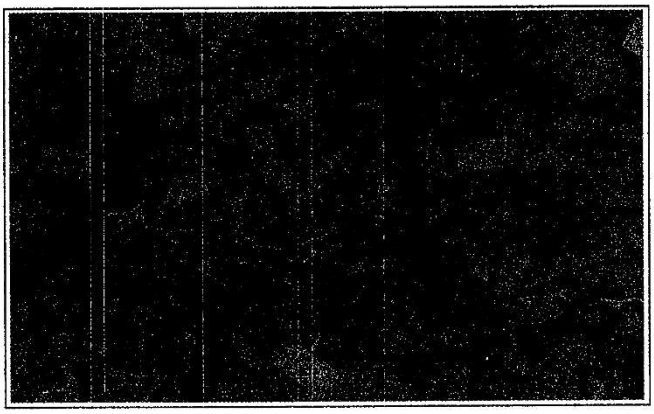
4.3.2 Use the two-way table above to determine the probability that a learner chosen at random is a boy that passed the test. Write the answer as a fraction in its simplest form. (3)

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QUESTION 5

5.1 Nomsa grows and sells amadumbe (yams) to raise extra cash to support her family. She sells amadumbe in 5 kg packs for R30 per pack. Each empty red mesh bag costs her R5. The total fix cost is R500 per month excluding the red mesh bags.



Use the information above to answer the questions that follow.

5.1.1 The formula below is used to calculate Nomsa's total cost for the month.

Total Cost (R) = R500 + R5 × number of mesh bags

TABLE 3: TOTAL COST/INCOME FOR AMADUMBE PACKS

NUMBER OF AMADUMBE PACKS	0	20	40	Q	80
TOTAL COST (R)	500	P	700	825	900
TOTAL INCOME (R)	0	600	1 200	1 950	2400

(4)

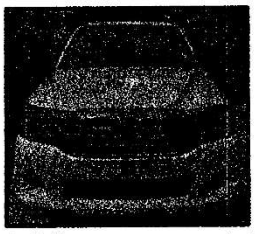
Use the given formula above to calculate the values of **P** and **Q**.

5.1.2 The graph for total cost is drawn on the ANSWER SHEET provided. On the same set of axes draw the graph for total income. (4)

5.1.3 Explain the importance of understanding the break-even point in the given context. (2)

5.2 Nomsa wants to buy a used bakkie. She viewed an Autotrader on the internet as shown below.

Retail price: R150 000
Deposit: R30 000
Repayment period: 6 years
Monthly instalment: R2 208,00
Estimated interest rate: 9,75% p.a



[Adapted from www.autotrader.co.za]

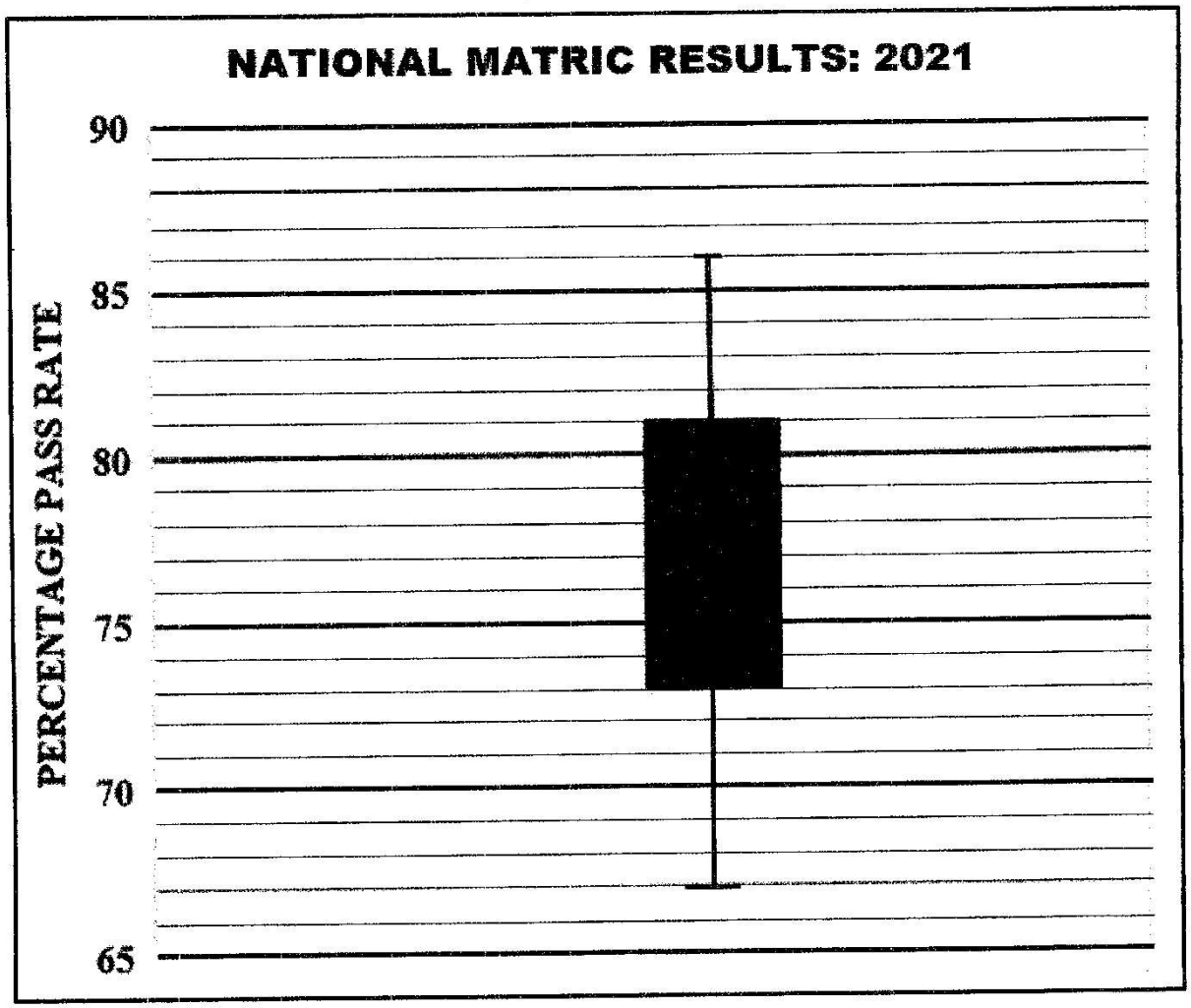
5.2.1 Calculate the real cost of the loan.
You may use the formula:

Real cost of the loan = monthly repayment × total number of months. (3)

5.2.2 Show how the total interest of **R38 976,00** was calculated. (4)

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5.3 The box-and-whisker plot below shows the 2021 matric pass rates for the nine provinces rounded off to the nearest whole numbers.



[Adapted from www.careersportal.co.za]

Use the box-and-whisker plot and the information above to answer the following questions.

5.3.1 Write down the minimum and maximum pass rates. (2)

5.3.2 One Mathematical Literacy learner stated that the difference between the range and the Inter-Quartile Range (IQR) is 12%. Verify, using calculations whether the statement is correct.

You may use the formula: $\mathbf{IQR = Q_3 - Q_1}$ (6)

5.3.3 Free State Province had the highest pass rate for 2021 matric results. If 35 055 Grade 12 learners wrote, calculate the number of learners who failed. (4)

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TOTAL MARKS: 150

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