



**higher education  
& training**

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL CERTIFICATE (VOCATIONAL)**

**MATHEMATICAL LITERACY**

**(Second paper)**

**NQF LEVEL 4**

**(10401034)**

**23 November 2020 (X-paper)**

**09:00–12:00**

**Calculators may be used.**

**This question paper consists of 11 pages and 2 answer sheets.**

**025Q2N2023**

<p><b>TIME: 3 HOURS</b> <b>MARKS: 150</b></p>
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### 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. Show all the calculations.
  5. All answers must be rounded off accurately to TWO decimal places unless stated otherwise.
  6. Drawings are not drawn to scale.
  7. Answer QUESTION 2.1.2 and QUESTION 3.1.1 on the ANSWER SHEETS (attached).
  8. Use only a black or blue pen.
  9. Write neatly and legibly.
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**QUESTION 1**

- 1.1 Nandipa is a netball player who lives in Durban. She is going on tour with her team to Johannesburg and she draws up the budget shown below to plan for the tour. She managed to balance the income with the expenses.



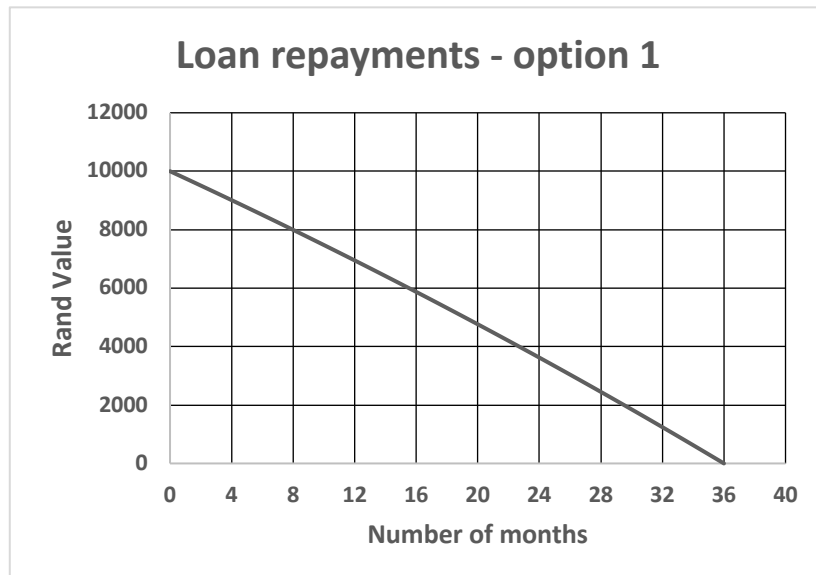
<b>INCOME</b>	
Sponsorship from Sports World	15 000
Sponsorship from Netballers	10 000
Parent's contribution	<b>A</b>
Club contribution	4 000
<b>TOTAL</b>	
<b>EXPENSES</b>	
Transport	21 850
Accommodation	7 500
Uniforms	3 150
Entry fee	4 200
Insurance	1 800
Other	2 500
<b>TOTAL</b>	

- 1.1.1 Calculate the value of A (Parent's contribution). (4)
- 1.1.2 Due to economic uncertainty, the sponsorship from Sports World for the next year is expected to reduce by half and the sponsorship from Netballers is expected to reduce by 15%. Determine the expected income from sponsorships if the reduction takes place.  (4)
- 1.1.3 After the tour, Nandipa calculates the actual costs. Transport showed a variance of -R1 250.
- (a) Explain what this means.  (1)
- (b) Calculate the actual transport cost. (2)

- 1.2 Nandipa's club needs to buy new equipment and they get a loan from the bank for which they make a monthly payment of R316,17.

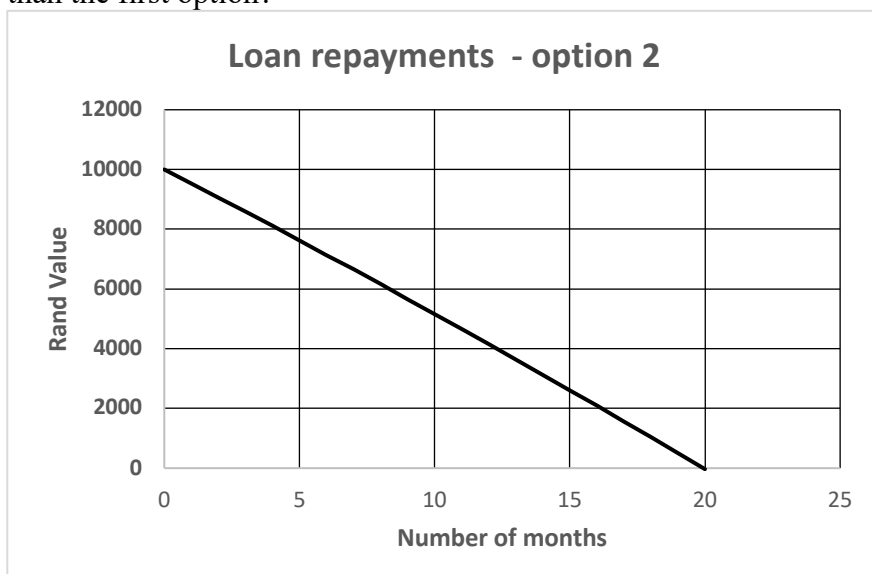


The payments over time for this first option are shown in the graph below.



- 1.2.1 Use the graph to determine the total loan amount and the number of years that it will take to repay the loan amount. (2)
- 1.2.2 (a) Calculate the total amount that the club pays over the full period. (2)
- (b) Calculate the amount of interest paid. (2 × 2) (4)
- 1.2.3 The club wants to pay the same monthly amount but reduce the repayment period. How could this be achieved? (2)

- 1.3 The graph below shows the same loan amount but the club increases the monthly payment to R540. How much interest would Nandipa's club save by choosing this second option rather than the first option?



(4)

- 1.4 Nandipa attends netball practice three times per week and takes a bus to get there and back home.

Use the table below to help her choose which ticket option would be the cheapest for her. Show all the calculations to justify your decision.

TICKET TYPE	
Daily (one way)	R12
Weekly (maximum 10 trips)	R100
Monthly (maximum 44 trips)	R340



(7)

- 1.5 Nandipa's husband is 32 years old and has an annual taxable income of R386 000. His monthly tax deduction for the last year was R6 241 per month.

Study the tax rate table to answer the questions.



2020 TAX YEAR (1 MARCH 2019 - 29 FEBRUARY 2020)	
ANNUAL TAXABLE INCOME (R)	RATES OF TAX (R)
0 – 195 850	18% of taxable income
195 851 – 305 850	35 253 + 26% of taxable income above 195 850
305 851 – 423 300	63 853 + 31% of taxable income above 305 850
423 301 – 555 600	100 263 + 36% of taxable income above 423 300
555 601 – 708 310	147 891 + 39% of taxable income above 555 600
708 311 – 1 500 000	207 448 + 41% of taxable income above 708 310
1 500 001 and above	532 041 + 45% of taxable income above 1 500 000

TAX REBATE	2020
Primary	R14 220
Secondary (65 and older)	R7 794
Tertiary (75 and older)	R2 601

[Source: [www.sars.gov.za](http://www.sars.gov.za)]

- 1.5.1 Calculate how much annual tax Nandipa's husband should have paid. (6)
- 1.5.2 (a) What is the difference in what he actually paid compared to what he should have paid? (4)
- (b) Does he owe money to SARS or will they refund him? (1)
- [41]

**QUESTION 2**

- 2.1 Nandipa's club wants to present a netball clinic during the school holidays and need to hire additional courts. Nandipa does some research and finds the following 2 options:

Option 1: R1 100 per day

Option 2: R1 500 deposit plus R900 per day



Nandipa draws up the following table:

No. of days	0	3	A	8	10	12	15
Option 1	0	3 300	5 500	B	11 000	13 200	16 500
Option 2	1 500	4 200	6 000	8 700	10 500	C	15 000

- 2.1.1 Calculate the values of A, B and C in the table above. (3 × 2) (6)

- 2.1.2 Draw TWO graphs on the same set of axes on the ANSWER SHEET (attached) showing the two options in the table. Label the axes and give the graph a suitable heading.



Write your EXAMINATION NUMBER in the space provided on the ANSWER SHEET and hand it in with the ANSWER BOOK.

(10)

- 2.1.3 Write a formula that can be used to calculate cost using Option 1. (2)

- 2.1.4 Write a formula that can be used to calculate cost using Option 2. (3)

- 2.1.5 From the graph, complete the following sentence by writing the answer next to the letter (a) and (b) in the ANSWER BOOK.

For less days than (a) ... days it will be cheaper to use option (b) ...

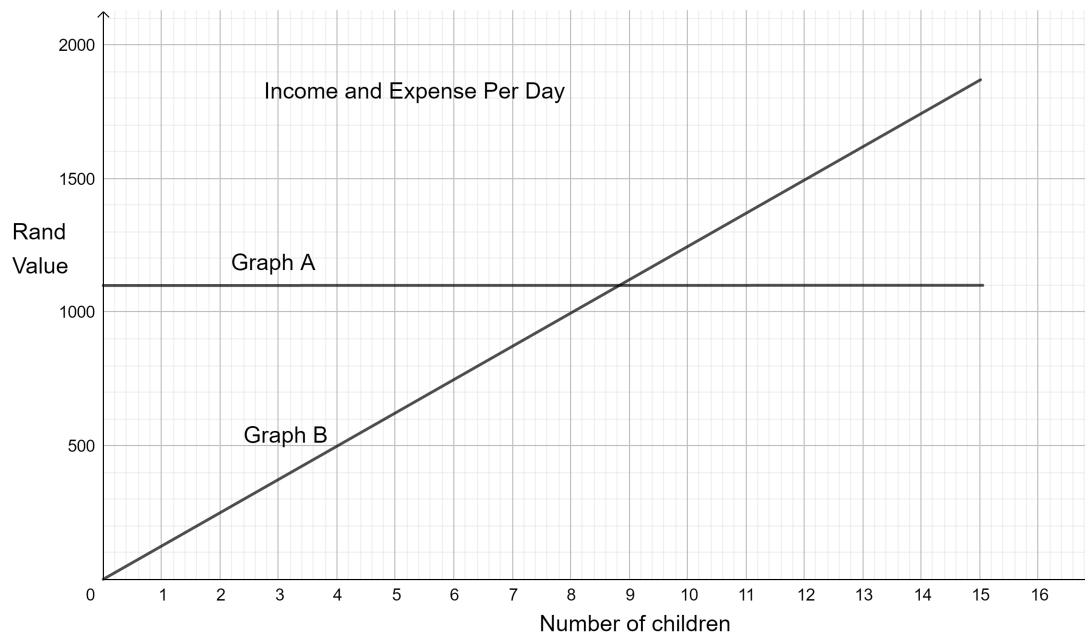




(2)

- 2.2 Nandipa decides to do some calculations using Option 1 to see how much profit they would be able to make for 1 day, and how many children they would need to have. The horizontal axis represents the number of children and the vertical axis represents the amount in rand. The two graphs drawn represents the income and expenses for one day.



She draws up the following graph to help her.



- 2.2.1 Name the graph which represents the expenses and give a reason for your answer.  (3)
- 2.2.2 Calculate the amount of the income per child from graph B. (3)
- 2.2.3 Determine the minimum number of children that would have to participate for this day for Nandipa to make a profit? (2)
- 2.2.4 Calculate how much profit Nandipa would make if she had 15 children. Show ALL the calculations.  (4)
- [35]

**QUESTION 3**

- 3.1 Nandipa keeps a record of the number of children that attend the netball clinic during the first 2 weeks of the holiday and draws up the following table to help analyse the attendance:

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Week 1	12	14	18	20	19	25
Week 2	17	16	22	22	26	30

- 3.1.1 Draw a double bar graph on the ANSWER SHEET (attached) to show the number of children for each day of the 2 weeks. Label the axes and give the graph a suitable heading.



Write your EXAMINATION NUMBER in the space provided on the ANSWER SHEET and hand it in with the ANSWER BOOK.

(6)

- 3.1.2 Calculate the difference in the percentage of children that attended on a Saturday compared to a Monday.

(6)

- 3.1.3 What conclusion can Nandipa draw based on the above information?

(2)

- 3.1.4 Statistical calculations can be classified as measures of *central tendency* and *spread*.



Copy the following table into the ANSWER BOOK and write the statistical terms given in the following list under the correct heading.

mean; median; range; mode
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CENTRAL TENDENCY	SPREAD

(4)

- 3.1.5 (a) Calculate the *mean* and *mode* of each week.

(7)

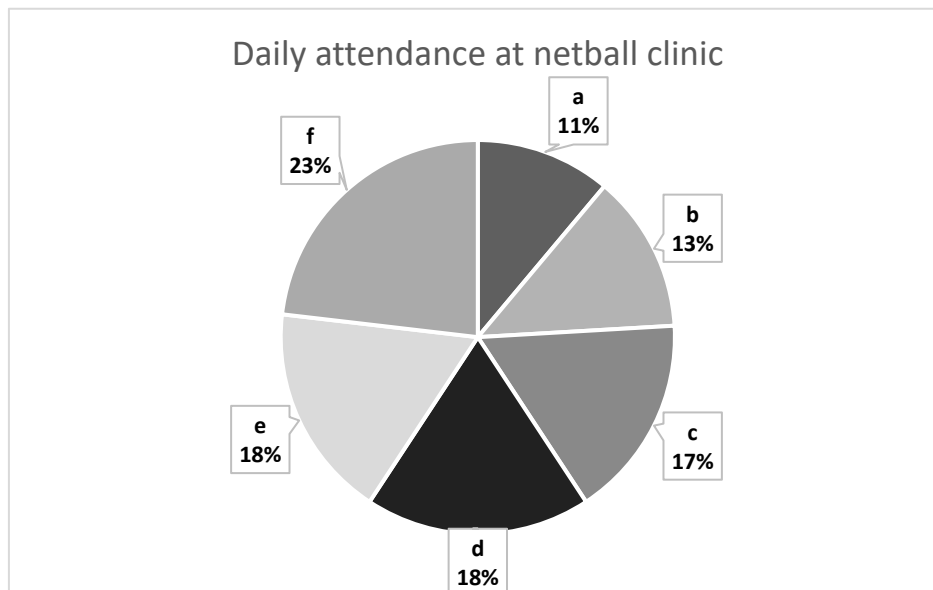
- (b) Is the mean or the mode the more meaningful calculation for Nandipa? Give a reason for the answer.

(2)





- 3.2 Nandipa draws up the following pie chart for 6 days of the netball clinic. Use the chart and answer the questions.

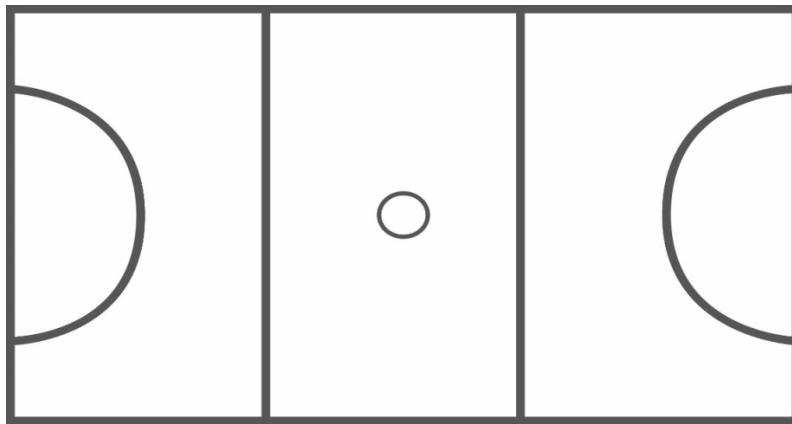


- 3.2.1 Which day is represented by section 'f' of the chart? Give a reason for the answer. (3)
- 3.2.2 What does this pie chart show that the bar graph does not show? (2)
- 3.2.3 Calculate the number of degrees for the slice of the pie chart marked 'a'. (3)
- [35]



### QUESTION 4

- 4.1 The diagram below shows the layout of a netball court. Study the diagram and answer the questions.



Length of court = 30,5 m

Width of court = 15,25 m

Radius of semicircle = 4,9 m

Area of centre circle = 0,64 m<sup>2</sup>

*Area of circle* =  $\pi r^2$

*Circumference* =  $2\pi r$

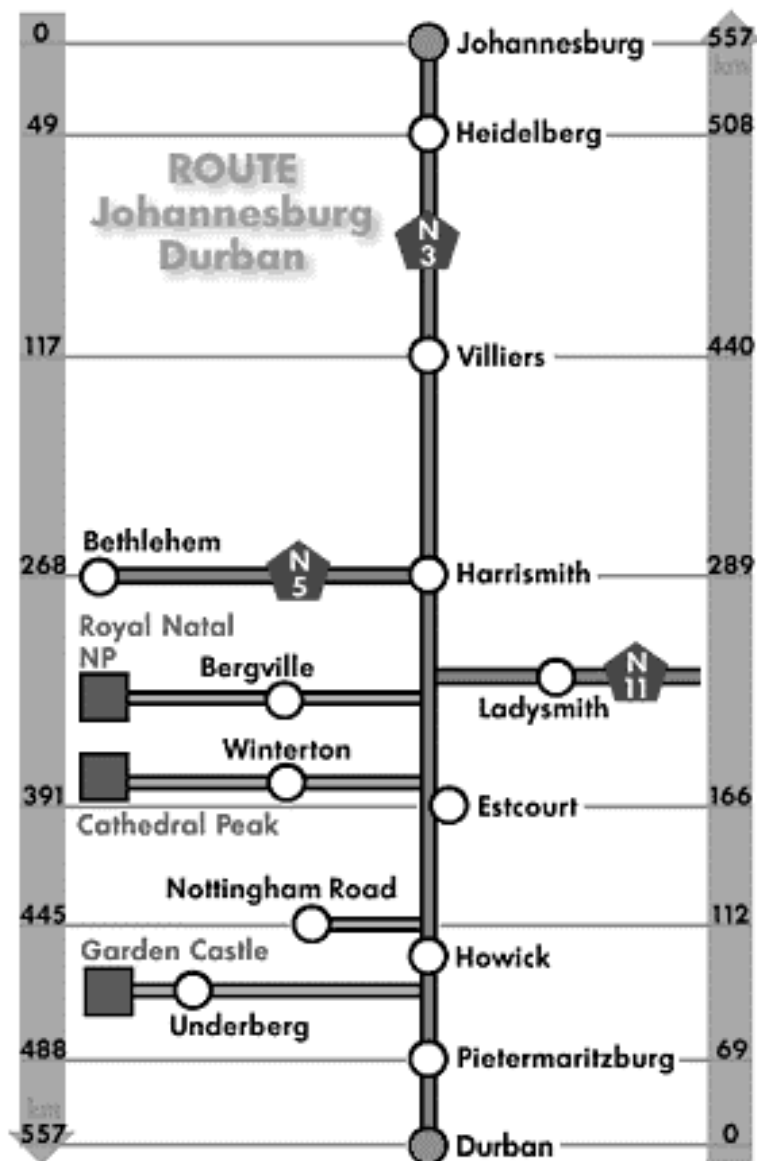
$\pi = 3,14$

- 4.1.1 (a) Calculate the radius of the centre circle (round off to 2 decimal places). (3)
- (b) Calculate the circumference of the centre circle. (2)
- 4.1.2 Calculate the length of lines to be painted if all the lines need to be painted. (6)
- 4.1.3 The club budgets R1 500 to paint the lines. Determine, by showing calculations, if the budgeted amount will be enough using the following information: (8)
- 1 litre of paint will cover 15 m
  - Paint is sold in 5 litre tins which cost R485 each.
- 4.1.4 In the diagram of the netball court, the court has a length of 12,2 cm and the actual length is 30,5 m. Calculate the scale of the diagram. Give the answer in ratio format. (5)
- 4.1.5 The chairs positioned on one side of the length of the court are 45 cm wide and there are 3 rows of chairs. (5)
- (a) Calculate the number of chairs that will fit along the length of the netball court. (5)
- (b) Calculate the total number of chairs that will be on one side of the length of the court? (2)

4.2 The strip map shows the route between Johannesburg and Durban.



Study the map and answer the questions.



- 4.2.1 Nandipa's bus leaves Durban at 08:00 and travels at an average speed of 96 km/h.  
What time will they reach Harrismith?

HINT:  $speed = \frac{distance}{time}$



(5)

- 4.2.2 How much further do they have to travel to reach Johannesburg?

(3)

[39]



**TOTAL: 150**

ANSWER SHEET

EXAMINATION NUMBER:

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QUESTION 2.1.2

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ANSWER SHEET

EXAMINATION NUMBER:

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QUESTION 3.1.1

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