higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(First Paper)
NQF LEVEL 2

(10401012)

5 November 2019 (Y-Paper)
13:00–16:00

Non-programmable calculators and drawing instruments may be used.

This question paper consists of 11 pages and 1 addendum.

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TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Read ALL the questions carefully.
2. Answer ALL the questions.
3. Number the answers according to the numbering system used in this question paper.
4. Clearly show ALL calculations, diagrams, graphs, et cetera, that will be used in this paper.
5. Round the answers to TWO decimal places where necessary, unless stated otherwise.
6. Drawing instruments, including rulers, pairs of compasses and protractors may be used.
7. Diagrams are not necessarily drawn to scale.
8. Answer QUESTIONS 4.2.5 and 5.1.1 on the ADDENDUM (attached). Hand in the addendum with the ANSWER BOOK.
9. Write neatly and legibly.

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QUESTION 1

1.1 Calculate the following:

1.1.1 $\frac{1}{2} + 10 \times 40$

1.1.2 $(20 - 6) - (50 - 36)$

1.1.3 $8^2 + \sqrt{36}$

(3 × 1) (3)

1.2 Arrange the following temperatures from the hottest to the coldest:

−20 ºC ; −4 ºC ; 19 ºC ; 0 ºC (2)

1.3 Rafael achieved $\frac{20}{25}$ for his Electronics test. What percentage did he achieve? (2)

1.4 A bus leaves the station at 8:15 am and arrives at its destination at 14:28.

1.4.1 Write 8:15am in 24-hour clock (digital time). (1)

1.4.2 How long did the trip take? (3)

1.5 Convert 2 341 grams to kilograms. Round off your answer to ONE decimal place. (3)

1.6 Adam and Jenna divide R500 in the ratio 8:12.

1.6.1 Write 8:12 in its simplest form. (2)

1.6.2 How much money will Adam receive? (3)

1.7 The price of a television is R5 250. How much would you pay if you get a 20% discount? (3)

1.8 Chicken costs R39,75 per kilogram.

1.8.1 Estimate how much you would pay for 3 kg of chicken. Show ALL calculations. (3)

1.8.2 Calculate the actual cost of 3 kg of chicken. (2)

1.9 The exchange rate is £1 = R18,85.
Convert £600 to rands. (3)

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QUESTION 2

2.1 Farmers use windmills to pump water from under the ground into circular dams or containers to provide water for their livestock.

[Source: *http://moziru.com*]

Study the sketch above and answer the questions.

2.1.1 What kind of three-dimensional shape does the dam represent? (1)

2.1.2 Calculate the radius of the multi-bladed wheel. (2)

2.1.3 Calculate the circumference of the multi-bladed wheel.

Use the formula: C = $2\pi r$ or C = πd where π = 3,14 (3)

2.1.4 Calculate the volume of water, in m^3 that the dam can hold if the radius of the dam is 2 m and the height is 300 cm.

Use the formula: V = $\pi r^2 h$ where π = 3,14 (3)

2.2 Below is the grid map of Junk Food Island. Study the grid map and answer the questions.

[Source: *http://mcwdn.com*]

2.2.1 Name the junk food that can be found in grid D2? (1)

2.2.2 In which grid can you find Pizza Hut? (2)

2.2.3 In which direction is the Snickers from the Classic Coke? (2)

2.2.4 The scale of the map is 1:500 000. Calculate the real distance between Doritos and Twizzles if the measurement on the map is 4,5 cm. Give your answer in km. (5)

2.3 Below is a floor plan of The Wokingham Theatre Auditorium.

[Source: *http://www.Wokingham-theatre.org.uk/*]

Study the floor plan above and answer the questions.

2.3.1 Which row is closest to the stage? (1)

2.3.2 How many fire exits are indicated on the floor plan? (1)

2.3.3 Does the auditorium have space available for persons in wheelchairs? Give a reason for your answer. (2)

2.3.4 How many rows are in the auditorium? (1)

2.3.5 How many seats are available in the auditorium? Do not consider the spaces for persons in wheelchairs. (2)

2.3.6 A group of 7 people book seats to watch a play in the auditorium. The group will be seated in consecutive seats (next to one another) in row A, starting at seat A4. In which seat would the 7th person be seated? (1)

2.3.7 The breadth of the stage is 15 m and the length is 4 m. Calculate the area of the stage.

Use the formula: A = length × breadth. (3)

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QUESTION 3

Study the information below regarding Ben's monthly income and expenditure and answer the questions.

3.1

Part-time job = R4 500
Cell phone = R300
Loan repayment = R1 000
Pocket money from parents = R1 500
Rent = R2 500
Groceries = R2 000

3. 1.1 Copy the table below into your ANSWER BOOK and sort the list above into the correct columns.

BEN'S BUDGET

INCOME	**R**	**EXPENSES**	**R**
TOTAL INCOME		TOTAL EXPENSES	

(8)

3.1.2 Is rent a fixed or a variable expense? Give a reason for your answer. (2)

3.1.3 Calculate the difference between Ben's income and expenses and state whether it is a surplus or a deficit. (3)

3.1.4 Imagine that Ben had a surplus of R500. Give Ben some sensible advice as to how he should use this surplus of money. (1)

3.2 Vodacom is introducing a new way of billing calls. Below is a breakdown of how this billing system will work.

vodacom	**ANYTIME PER SECOND** **Pay a low 2c per second all day to any network** **Pay only R1,20 per minute billed per second** There are no 'peak' or 'off-peak' rates • Get FREE night shift: 60 minutes free calls between midnight and 5 am for 7 days with every recharge of R12 or more

3.2.1 How much would a person pay per second for a call? (1)

3.2.2 Is it correct to claim that a call is charged at R1,20 per minute if you charge 2c per second? Show your calculations. (2)

3.2.3 How much would you pay for a call that lasts 3 minutes and 20 seconds? (3)

3.2.4 Is there a difference in rates for 'peak' and 'off-peak' calls? (1)

3.2.5 The price of a new cell phone is R2 600 (excluding VAT of 15%).

Calculate the price of the cell phone after VAT was added. (4)

3.3 Below is an extract from one of Mrs Petersen's bank statements. Study the bank statement and answer the questions.

DATE	DESCRIPTION	REFERENCE	AMOUNT (Rand)	BALANCE (Rand)
14 March	Opening balance			941,32Cr
15 March	Biolife	180241	86,80	854,52Cr
15 March	Biolife	180241	340,46	514,06Cr
22 March	RENCONNECT	S245136	8 567,00Cr	9 081,06Cr
23 March	Nedbank account	NA45128721	6 600,00	2 481,06Cr
26 March	Talkbusy	365TB86	196,00	2 285,06Cr
29 March	Charity	2458714	57,00	2 228,06Cr
31 March	Monthly account fee		**A**	2 147,56Cr
3 April	RENCONNECT	S245136	1176,71	**B**
7 April	Monthly account fee		24,50	946,35Cr

3.3.1 What was the opening balance of the bank statement?

3.3.2 What was the reference of Talkbusy on 26 March?

3.3.3 On 22 March there was an amount of R8 567,00Cr from RENCONNECT. What is the meaning of the 'Cr' after the amount?

3.3.4 Calculate the monthly account fee on 31 March. (Value of **A**)

3.3.5 What is the balance of this statement on 3 April? (Value of **B**)

(5 × 1) (5)

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QUESTION 4

4.1 PURE BLISS is a company that sells bottled water. They have a production line where a machine fills the bottles with water. The following graph indicates how many bottles can be filled within a specific time.

Answer the following questions by making use of the graph above:

4.1.1 Copy the following table into your ANSWER BOOK and complete:

Time in hours	0	1				
Number of bottles	0		400			

(8)

4.1.2 Name the independent variable in the table. (2)

4.1.3 Name the dependent variable in the table. (2)

4.1.4 Is the graph an example of a direct or indirect/inverse relationship? Give a reason for your answer. (3)

4.2 Grapes are transported to shops in boxes. It takes one worker 60 minutes to fold 30 boxes. The following table investigates how long it will take to complete the task if more workers are used.

Number of workers (x)	1	**A**	3	4	5
Number of minutes (y)	60	30	20	**B**	12

4.2.1 How long will it take 3 workers to complete the task? (1)

4.2.2 Calculate the value of **A**.
Hint: Use $x \times y = 60$ (2)

4.2.3 Calculate the value of **B**.
Hint: Use $x \times y = 60$ (2)

4.2.4 Name the independent variable. (2)

4.2.5 Use the table to draw a graph on the ADDENDUM (attached). Provide suitable labels for your graph. (5)

4.2.6 Is the graph an example of a direct or indirect/inverse relationship? Give a reason for your answer. (3)

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QUESTION 5

5.1 The stationery shop at a college sells school supplies to students. Below is a graph that indicates the different items that they sold on a specific day.

[*www.mathscore.com*]

Study the graph and answer the questions.

5.1.1 Make use of the graph and complete the tally and frequency table on the ADDENDUM (attached). (7)

5.1.2 How many binders were sold? (1)

5.1.3 Which school supply had the lowest number of items sold? (1)

5.1.4 Which TWO school supplies had the same number of items sold? (2)

5.1.5 What was the total number of items sold? (2)

5.1.6 If a notebook is sold for R25, calculate how much money was received for selling notebooks. (3)

5.2

The World Championship for eating the most hotdogs in one minute takes place on Coney Island, USA, every year. In 2017, Joey Chestnut set a new world record by eating 72 hotdogs in one minute. The following table shows how many hotdogs the winners ate from 2008 to 2017.

YEAR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NUMBER	59	68	54	62	68	69	61	62	70	72

[*https://nathansfamous.com*]

5.2.1 Calculate the average amount of hotdogs the winners ate from 2008 to 2017. (3)

5.2.2 Calculate the range of hotdogs the winners ate from 2008 to 2017. (3)

5.2.3 Calculate the mode of hotdogs the winners ate from 2008 to 2017. (2)

5.2.4 Calculate the median of hotdogs the winners ate from 2008 to 2017. (3)

5.2.5 An observation method was used to determine the amount of hotdogs the winners ate each year. Do you think that was a suitable method to use to collect the data? Give a reason for your answer. (3)

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TOTAL: 150

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ADDENDUM

QUESTION 4.2.5

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

QUESTION 5.1.1

SCHOOL SUPPLY ITEM	TALLY	FREQUENCY
Binder		
Notebook		
Highlighter		
Folder		
Crayon		
Clipboard		
	TOTAL:	

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