higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(Second paper)

NQF LEVEL 2

(10401012)

28 November 2022 (Y-paper)
13:00–16:00

Drawing instruments, including rulers, pairs of compasses and protractors may be used.
Approved calculators may be used unless stated otherwise.

This question paper consists of 9 pages and a 3-page answer sheet.

583Q2N2228

Copyright reserved

TIME: 3 HOURS
MARKS: 150

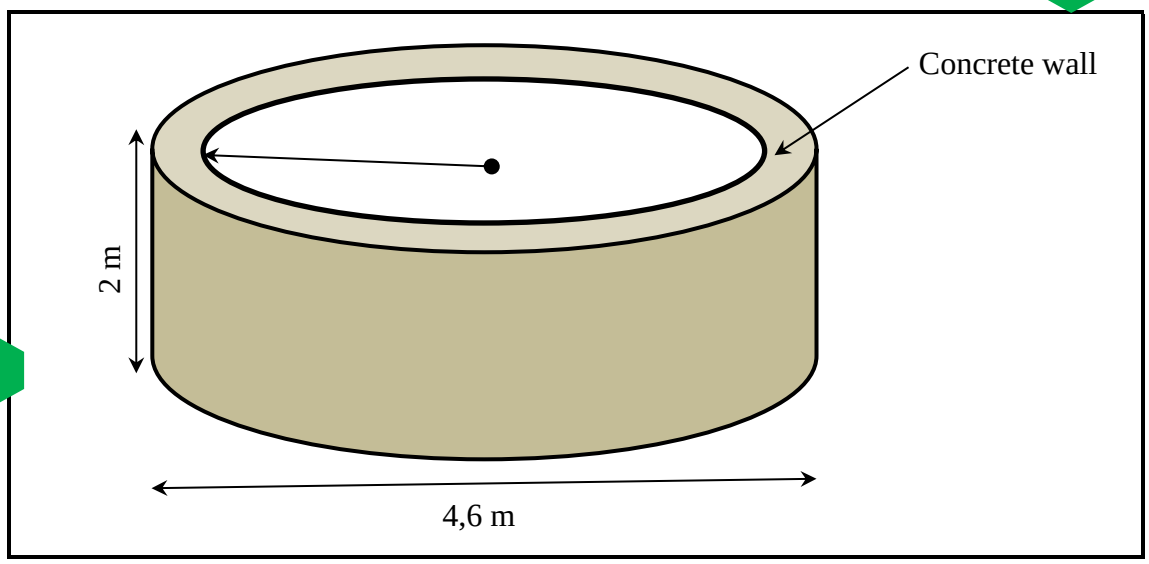
INSTRUCTIONS AND INFORMATION

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, diagrams, graphs, et cetera, used in determining the answers.
5. Approved calculators may be used unless stated otherwise.
6. Round off the answers to TWO decimals, unless stated otherwise.
7. Use π = 3,14. Learners will be penalised if any other value is used.
8. Drawing instruments, including rulers, pairs of compasses and protractors may be used.
9. Answer QUESTION 2.2 and QUESTION 3.3.1 on ANSWER SHEET 1, QUESTION 4.1.3 on ANSWER SHEET 2 and QUESTION 4.2.3 on ANSWER SHEET 3.
10. Diagrams are not necessarily drawn to scale.
11. Start each question on a new page.
12. Use only a blue or black pen.
13. Write neatly and legibly.

Copyright reserved

QUESTION 1

1.1 Mr Mathipa has a farm and decided to build a water tank using concrete and stone. The sketch of the tank shown below has an outside diameter of 4,6 m and a height of 2 m. The water from the tank runs into a trough.



1.1.1 What is the geometrical name given to the shape of the water tank? (1)

1.1.2 Determine the outer radius of the water tank? (3)

1.1.3 If the concrete wall is 0,15 m thick, determine the inner radius of the water tank. (2)

1.1.4 Calculate the volume of the water tank using the inside radius.

Formula: Volume of the tank $= \pi \times r^2$ x h, π = 3.14 (3)

1.1.5 Calculate the volume of the concrete used to build the tank. (6)

1.1.6 If the tank is filled right to the top, calculate the amount of water (in litres) that is in the tank.

1 m^3 = 1 000 litres. (3)

1.1.7 The farm uses 1900 litres of water per day. Mr Mathipa and his family want to go on holiday for a full two weeks (14 days). He filled the tank to the top.

Use calculations to determine whether the full tank will last for two weeks. Show all your steps clearly. (4)

Copyright reserved

1.2 Study the map of South Africa and answer the questions below.



1.2.1 If the scale on a map is 1 cm:250 km. Explain in your own words what a scale of 1 cm:250 km means? (2)

1.2.2 What is the direction of Durban from Nelspruit? (2)

1.2.3 The actual distance between Durban and Pretoria is 625 km. Use the given scale to calculate the map distance. (4)

1.2.4 Durban and Upington are 4,8 cm apart on the map.

Calculate the actual distance between Durban and Upington. (4)

1.2.5 Tom took exactly 10 hours to drive 625 km from Durban to Pretoria for a rugby match.

(a) Calculate Tom's average speed for the trip in km/h.

Use the formula: Speed = Distance ÷ Time

(b) Tom's car used 50 litres of fuel to travel from Durban to Pretoria.

Determine the fuel consumption of Tom's car.

(2 × 3) (6)

[40]

QUESTION 2

2.1 A nurse at your college health clinic has recorded her daily consultations of students. She dealt with the following categories: wounds, general illness, contraception, sexually transmitted infections (STIs) and testing.

Given below is the record sheet that was completed by the nurse on a particular day:

STIs	STIs	STIs	General illness	General illness
Contraception	STIs	STIs	Wound	Wound
Contraception	Wound	Contraception	Contraception	STIs
Contraception	Contraception	STIs	STIs	Contraception
Wound	STIs	STIs	Wound	STIs
STIs	Wound	Contraception	STIs	Wound
General illness	Testing	Contraception	STIs	STIs
Wound	Contraception	STIs	Contraception	Contraception
General illness	Testing	General illness	General illness	General illness
General illness	Contraception	Testing	Testing	Contraception

2.1.1 How many students visited the college clinic on that day?

2.1.2 How many students had wounds?

2.1.3 How many students had an STI problem?

2.1.4 Give TWO disadvantages of representing data in a table as given above.

2.1.5 Write down any other TWO types of graphs that can be used to represent the same data.

(5 × 2) (10)

2.2 Use the above table to complete a frequency tally table found on ANSWER SHEET 1 (attached). (6)

2.3 Miss Buthelezi wants to compare the masses of boys to girls in her level 2 mathematical literacy class. The table below shows the weights of the boys and girls in the class.

MASS OF STUDENTS IN MISS BUTHELEZI'S CLASS			
BOYS		GIRLS	
Student No.	**Mass (in kgs)**	**Student No.**	**Mass (in kgs)**
1	60	1	27
2	48	2	71
3	82	3	60
4	42	4	52
5	46	5	78
6	60	6	50
7	50	7	54
8	64	8	31
9	46	9	72
10	66	10	73
11	36	11	90
12	60	12	98

2.3.1 What is the modal mass of boys? (2)

2.3.2 Determine the median mass of girls. Show all calculations. (4)

2.3.3 Calculate the difference between the *mean mass of the boys* and the *mean mass of the girls.* (7)

2.3.4 Determine the range of boys and the range of girls. (2 × 2) (4)

2.3.5 Miss Buthelezi claims that boys are healthier and better than girls.

Give ONE reason to support Miss Buthelezi's claim. (2)

[35]

Copyright reserved

QUESTION 3

3.1 Study the following financial document below and answer the questions.

TAX INVOICE

Invoice number: 43-06072013

Appliance Queen
611 Industrial Road
Fabricia, Kimberley, 8301

Tel 053 123 4567
VAT no. 560798

Ms M. Taetso
16 Home Street
Kimberley, 8300
Tel (H): 053 456 7890

Payment to be made on delivery of goods.
Cash and credit cards accepted.
No cheques.
Goods are guaranteed for 12 months from the date of purchase.

Invoice date: 6 July 2018

Description	Unit cost	Amount owed
1 top loader washing machine	R8 504,39	R8 504,39
VAT amount included		R1 044,39
	Invoice total	**R8 504,39**

3.1.1 What type of financial document is represented above? (2)

3.1.2 Who is the recipient of the document? (2)

3.1.3 (a) In which town is the company Appliance Queen located? (1)

(b) State TWO reasons to substantiate your answer (2)

3.1.4 Calculate the price of the washing machine before tax. (3)

3.1.5 What is the tax charged on the washing machine as a percentage? (4)

3.1.6 What will happen to the machine if it breaks down within six months? Substantiate your answer. (2)

Copyright reserved

3.2 Appliance Queen company has three payment options as shown on the pamphlet below.



Appliance Queen

14kg top-loader washing machine

- Cash:R8 504,39 vat incl.
- Layby: R8800
- Credit: Deposit 10%
  Plus R400 x 36

3.2.1 What was the CASH price of the washing machine including tax? (1)

3.2.2 If a person chose to buy the machine on credit how much would they have paid in total after 3 years? (4)

3.2.3 Express as a percentage how much more a person will pay on credit, compared to paying cash. (4)

3.2.4 Give TWO reasons why people still buy on credit even though it is more expensive. (2)

3.3 Lesley (an employed student) is doing Level 4 at a TVET College. He kept a record of his earnings and all the payments made during last month.

NASFAS bursary	R2 400
Parents allowance	R2 000
Rent to landlord	R1 500
Transport expenses	R500
Water/electricity	R200
Groceries	R1 300
Clothing	R1 200
Salary	R3 500

3.3.1 Complete Lesley's income and expenditure statement on ANSWER SHEET 1 (attached). (10)

3.3.2 Advise Lesley on THREE ways in which he could use his money more wisely. (3)

[40]

Copyright reserved

QUESTION 4

4.1 The college nurse was tasked to coordinate the Covid-19 vaccination programme for students at your college. The table below shows the number of vaccinating teams and the number of students they vaccinate per day.

Number of vaccinating teams	0	1	4	10	15	C
Number of students vaccinated per day	0	25	A	250	B	625

4.1.1 Name the dependent variable and the independent variable. (2)

4.1.2 Determine the values of A, B and C. (3)

4.1.3 Use the table to draw a straight-line graph on the grid on ANSWER SHEET 2 (attached). Give the graph a suitable heading and label both axes correctly. (8)

4.1.4 Write down the formula to calculate the number of students vaccinated per day in the form:

The number of students vaccinated = … × … (2)

4.1.5 If only 3 vaccinating teams were available to vaccinate students, how long will it take to vaccinate 340 registered students? (3)

4.1.6 Is the relationship between the number of vaccinating teams and the number of students vaccinated per day direct or indirect? Give a reason for your answer. (2)

4.2 The nurse completed the following table that shows the number of vaccinating teams compared to the number of days taken to vaccinate all students.

Number of vaccinating teams	1	2	3	6	9	**B**	18	36
Number of days taken to vaccinate all students	36	18	**A**	6	4	3	2	1

4.2.1 Determine the values of **A** and **B**. (2)

4.2.2 Explain the relationship between the number of vaccinating teams and the number of days taken. (2)

4.2.3 Use the table to draw a graph on the grid on ANSWER SHEET 3 (attached). Give the graph a suitable heading and label both axes correctly. (9)

4.2.4 The vaccinating teams failed to achieve their expected target of the number of students vaccinated.

Suggest TWO possible reasons why they failed to reach these targets. (2)

[35]

TOTAL: 150

Copyright reserved

ANSWER SHEET 1

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

QUESTION 2

2.2

REASON FOR CONSULTING	TALLY	FREQUENCY
STIs		
WOUNDS		
CONTRACEPTION		
GENERAL ILLNESSES		
TESTING		
TOTAL		

6

QUESTION 3

3.3.1

INCOME	**AMOUNT**	**EXPENDITURE**	**AMOUNT**
TOTAL INCOME		**TOTAL EXPENDITURE**	
SURPLUS/DEFICIT			

9

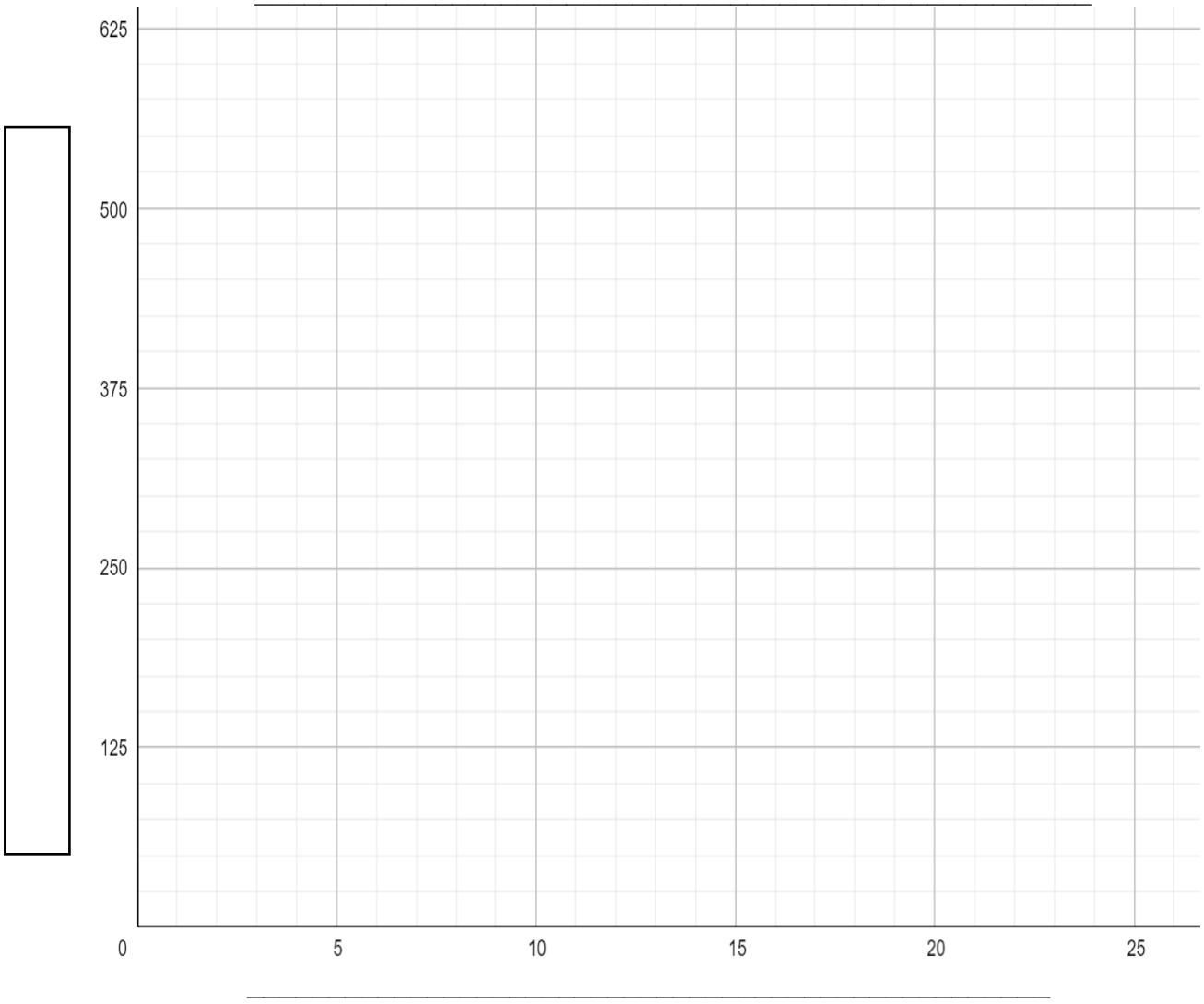
Copyright reserved

ANSWER SHEET 2

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

QUESTION 4

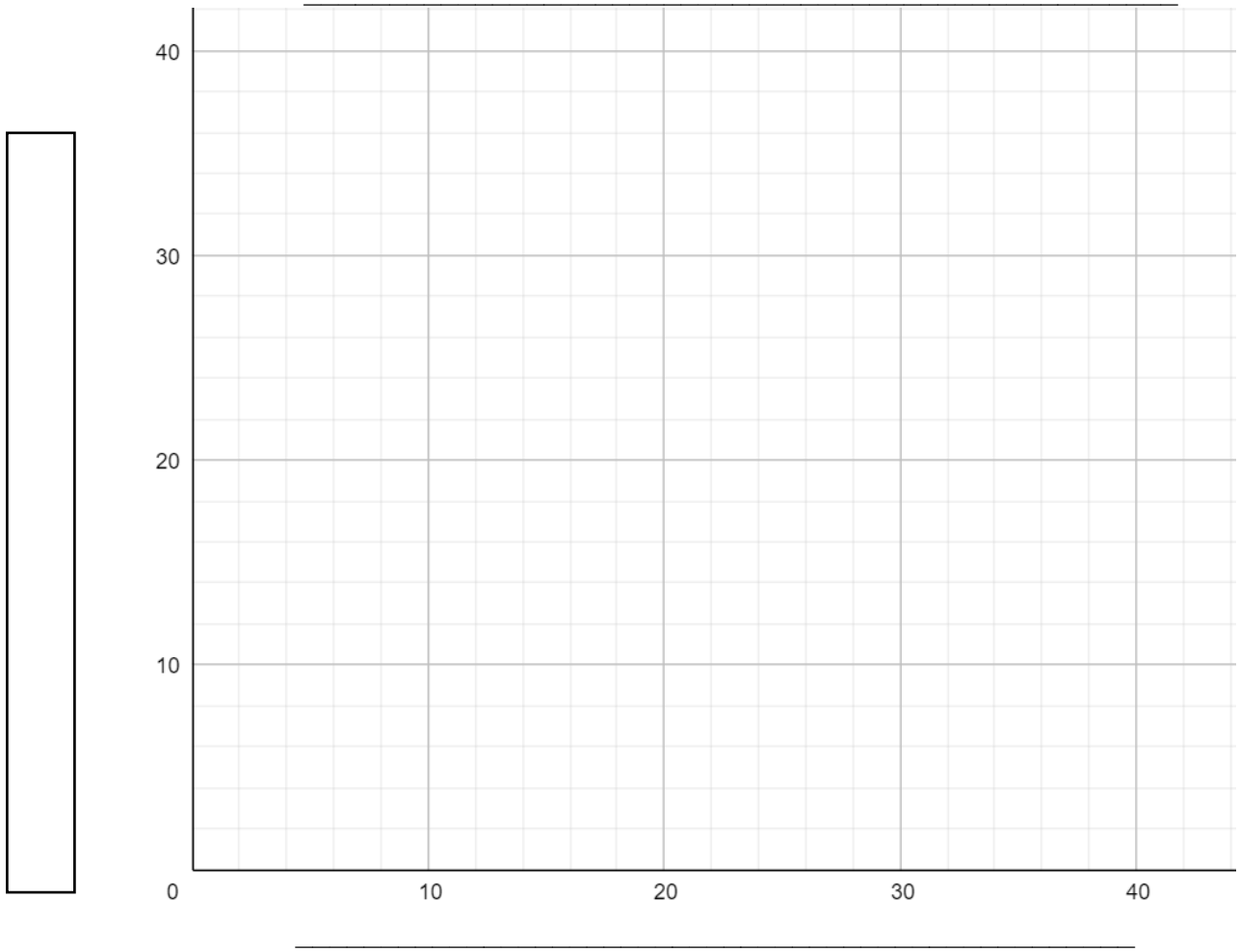
4.1.3



8

ANSWER SHEET 3

4.2.3



9

Copyright reserved