higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(First paper)

NQF LEVEL 3

(10401023)

31 October 2022 (X-paper)
09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 10 pages and 1 answer sheet.

007Q1N2231

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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. Start each question on a new page.
5. Show all the calculations clearly.
6. Round off answers according to the given context. In all cases where the context is not specific, round off answers to TWO decimals.
7. Answer QUESTION 4.3.4 on the ANSWER SHEET (attached). Write your EXAMINATION NUMBER on the ANSWER SHEET, detach it from the question paper and hand it in with the ANSWER BOOK.
8. Indicate units of measurement where applicable.
9. Diagrams are not necessarily drawn to scale.
10. Write neatly and legibly.

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QUESTION 1

1.1 Calculate each of the following without using a calculator. Show all calculations.

1.1.1 $(69\ 273 - 6\ 398) + (1\ 701 \div 63)$ (2)

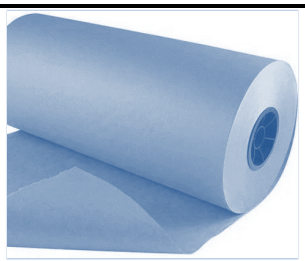
1.1.2 $\sqrt{256} + \sqrt[3]{27}$ (2)

1.1.3 $2\frac{2}{3} - 3\frac{1}{5} + 1\frac{1}{4}$ (3)

1.2 The COVID-19 cases in 2020 were 9,1 per 100 000 people.

How many COVID-19 cases were there in total if the total population of South Africa at the time was 39 million? Show all calculations. (4)

1.3 A small company stocks paper sheet rolls for manufacturing of goods. There are two options to buy sheet rolls. They are sold in 200m and 300m rolls as shown in the picture below.



Option A:
300m sheet roll cost R375,00

Option B:
200m sheet roll cost R275,00

1.3.1 Calculate cost of sheet per metre or each option. (4)

1.3.2 Which of the two options is the better buy? (2)

1.4

The South African Covid-19 vaccination 2021 report found that of the total number of people vaccinated, 5,6 million men and 5,59 million women used the J&J vaccine. The highest growth in the vaccination process is seen in the following cities: Johannesburg (55%), Cape Town (44%), Pretoria (49%) and Nelspruit (40%).

1.4.1 What is the difference between the number of vaccinated men and women who used the J&J vaccine? Write down your answer in thousands. (2)

1.4.2 Write down the percentage growth of Cape Town as a proper fraction in the simplest form. (2)

1.4.3 Round off 5,59 million to the nearest million. (2)

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1.5 Thengwe TVET Campus hired a bus for a trip. The journey started at 10:00 and ended at 13:00. The bus accommodated 62 students and the college was charged R3 751 to use the bus.

1.5.1 What is the cost per hour to use the bus? (2)

1.5.2 What is the cost per student to use the bus? (2)

1.5.3 If the bus took 27 min to reach the zoo which was 23 km away, how fast was the bus travelling in km/h? Round off the answer to the nearest whole number.

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

(3)
[30]

QUESTION 2

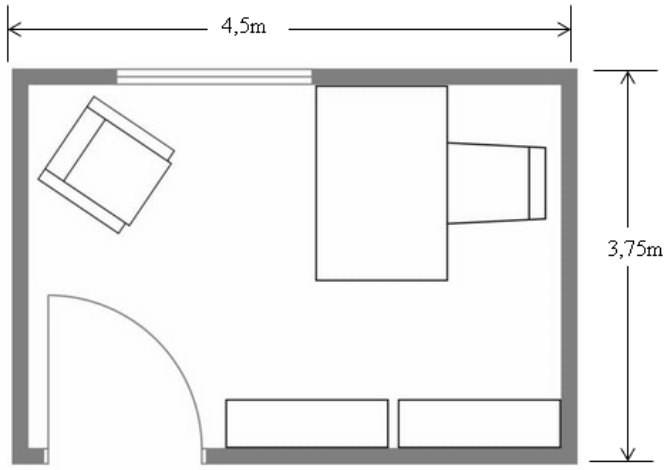
2.1 Choose a description from COLUMN B that matches a term in COLUMN A. Write only the letter (A–F) next to the question number (2.1.1–2.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1.1	Cylinder	A	a round ball-shaped solid
2.1.2	Rectangular prism	B	a regular solid with six square faces
2.1.3	Sphere	C	two hexagons and six rectangles/squares
2.1.4	Circumference	D	a three-dimensional shape, having six faces, all six faces are rectangles
2.1.5	Cube	E	the linear distance around a circle
		F	a three-dimensional solid figure which has two identical circular bases

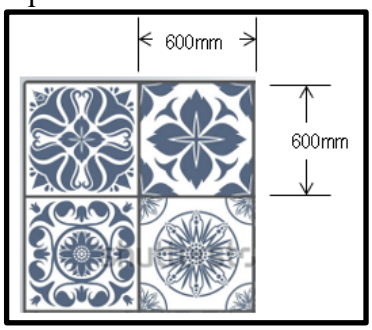
(5 × 1) (5)

2.2 The sketch below shows a floor plan of an office space with its dimensions. The floor must be covered with square tiles with a side length of 600 mm each.

Office Floor Plan



Square Tiles



Use the information on the sketch to answer the questions that follow:

2.2.1 What is the shape of the office floor plan? (1)

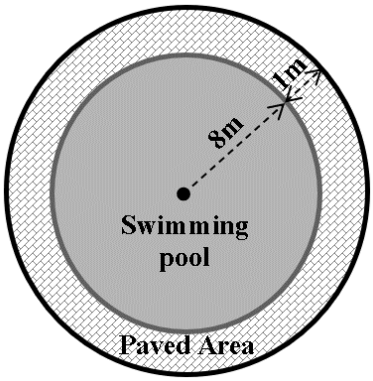
2.2.2 Convert 3,75 m to millimetres (mm). (2)

2.2.3 Determine the area of the floor in square metres (m^2).

Area = length × breadth
A = l × b (3)

2.2.4 How many tiles will she need to cover the floor? Show all calculations. (4)

2.3 The sketch below shows a circular swimming pool with a radius of 8 metres. The sketch also shows a paved area around and up to 1 metre away from the swimming pool.



Use the information on the sketch to answer the questions that follow:

2.3.1 Calculate the perimeter of the pool.

Formula: Circumference = 2×π×radius where π = 3,14 (2)

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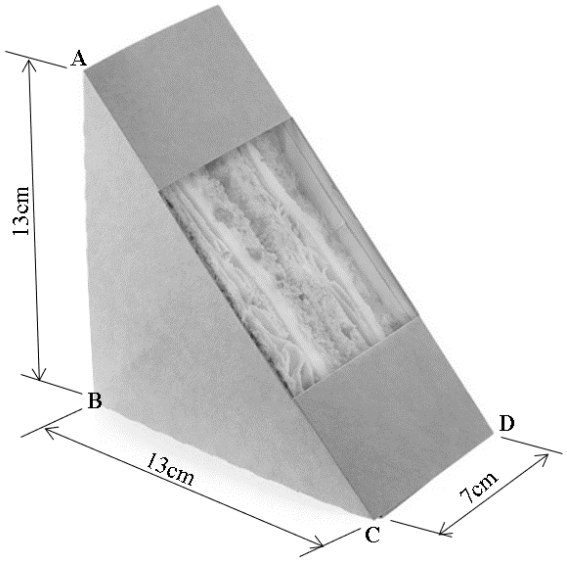
2.3.2 Calculate the paved area.

Formula: Area of a circle = $\pi \times (\text{radius})^2$ where $\pi = 3{,}14$ (3)

2.4 An entrepreneur wanted to start a small business that manufactures sandwich packaging container with paper and plastic. The picture below shows a design of a right-angled triangular sandwich packaging container to be manufactured.



Use the information on the picture to answer the questions that follow:

2.4.1 Use the theorem of Pythagoras to calculate the length AC on the picture.

AC = $\sqrt{AB^2 + BC^2}$ (3)

2.4.2 Calculate the space capacity of the packaging in cm^3. Use the formula provided below:

Volume = $\frac{1}{2} \times base \times height \times width$ (4)

2.4.3 One sandwich packaging container can fit only 4 halves of a slice of bread. Determine the number of containers required to fit 100 slices of bread. (3)

[30]

QUESTION 3

3.1 The bank statement of a business account below shows the transactions at the beginning of November.

Date	Transaction Description	Amount
01 November	Opening balance	R18 750,50
03 November	Credit: Credit card payment by client	R2 550,75
03 November	Debit: Payment to Service Company	R6 500,00
04 November	Electronic Fund Transfer: Payment to local municipality for rates and taxes	R10 000,00
05 November	Credit: Cash deposited into account	R4 360,00
05 November	Debit: Bank Charges	R300.00
06 November	Credit: Electronic Fund Transfer by client	R10 000,00
07 November	Cash withdrawal	R7 000,00
07 November	Closing balance	

Use the information provided in the bank statement to answer the questions that follow.

3.1.1 Calculate the closing balance at the end of 07 November. (10)

3.1.2 On which day was the account overdrawn? (2)

3.2 A car is sold for R60 000 at BB motors and a salesperson receives a payment of 3% commission of the sale.

Calculate how much did a salesperson receive in commission. (2)

3.3 Belinda works for 40 hours in a week and her basic rate is R15 per hour.

Calculate Belinda's total wage for the week. (2)

3.4 Josephine receives a gross salary of R15 975 per month. The following deductions are made: R159,75 for UIF; R1 597,50 for personal tax; R399,38 for pension contribution; R1 650 for medical aid.

Calculate her net yearly salary if rates of deductions remain constant for the entire year.

Formula: Net salary = Gross salary – deductions. (6)

3.5 A furniture store sells a coffee table at a cost of R1 450 inclusive of VAT of 15%.

3.5.1 Calculate the VAT amount paid. (4)

3.5.2 Calculate the original price before VAT was included. (2)

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3.6 A furniture store purchased a light delivery vehicle at a cost of R300 000,00 at the beginning of the year.

Calculate the cost of the light delivery vehicle at the end of the year if its value depreciated by 20%. (2)

[30]

QUESTION 4

4.1 The table below shows the number of minutes spent on the internet and the amount paid.

Number of minutes	1	2	3	4	5	6	**B**
Cost	R3,50	R7,00	R10,50	**A**	R17,50	R21,00	R28,00

Use the information provided in the table to answer the questions that follow.

Formula: Cost = R3,50 × number of minutes spent surfing.

4.1.1 What proportion does the relationship represent? (2)

4.1.2 Which is the independent variable? (2)

4.1.3 Which is the dependent variable? (2)

4.1.4 Use the given formula to calculate the value of A and B in the table. (2 × 2) (4)

4.2 A taxi driver makes an average of R35/h. He works for 10 hours per day.

4.2.1 Calculate his average daily income. (2)

4.2.2 Write down an equation to determine the average amount of money a taxi driver will make on a given number of days. (4)

4.3 A mobile motor car wash dealer charges R50,00 per car and a fee of R30 for callout. A formula to calculate the cost for mobile car wash dealer is given below.

Cost = R30,00 + (R50,00 × Number of cars)
Cost = R30 + R50n

4.3.1 Copy and complete the missing values A and B in the table below:

Number of Cars (n)	0	1	2	3	4	**B**
Cost in Rand(y)	30	80	130	180	**A**	380

(4)

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4.3.2 Determine the cost for a mobile car wash dealer if you called and decided not to wash on his/her arrival. (2)

4.3.3 Determine the number of cars washed if the dealer was called and was paid R730,00. (3)

4.3.4 Draw a line graph on the ANSWER SHEET (attached) that represents the information tabulated in QUESTION 4.3.1. (5)

[30]

QUESTION 5

5.1 A pathologist recorded the types of fatal accidents that occurred at home between boys and girls and represented the information in a frequency table given below.

Fatal type of accident at occurred at home	Number of girls	Number of boys	Total
Falls, including stairs and windows	~~////~~	~~////~~	10
Fires	////	~~////~~	**A**
Poisoning	//	///	5
Suffocating and choking	///	/	4
Strangulation	//	//	**B**
Drowning	~~////~~	~~////~~	10

Use the information provided in the frequency table to answer the questions that follow.

5.1.1 How many fatal accidents occurred because of poisoning and drowning? (2)

5.1.2 Determine the values for A and B. (2 × 2) (4)

5.1.3 Which is the most fatal type of accident that occurred at home? (2)

5.1.4 What is the total number of fatal accidents recorded for girls? (2)

5.1.5 What is the total number of fatal accidents recorded for boys? (2)

5.1.6 Calculate the total number of fatal accidents recorded by the pathologist. (2)

5.1.7 What percentage of the total fatal accidents were caused by suffocating and choking? (3)

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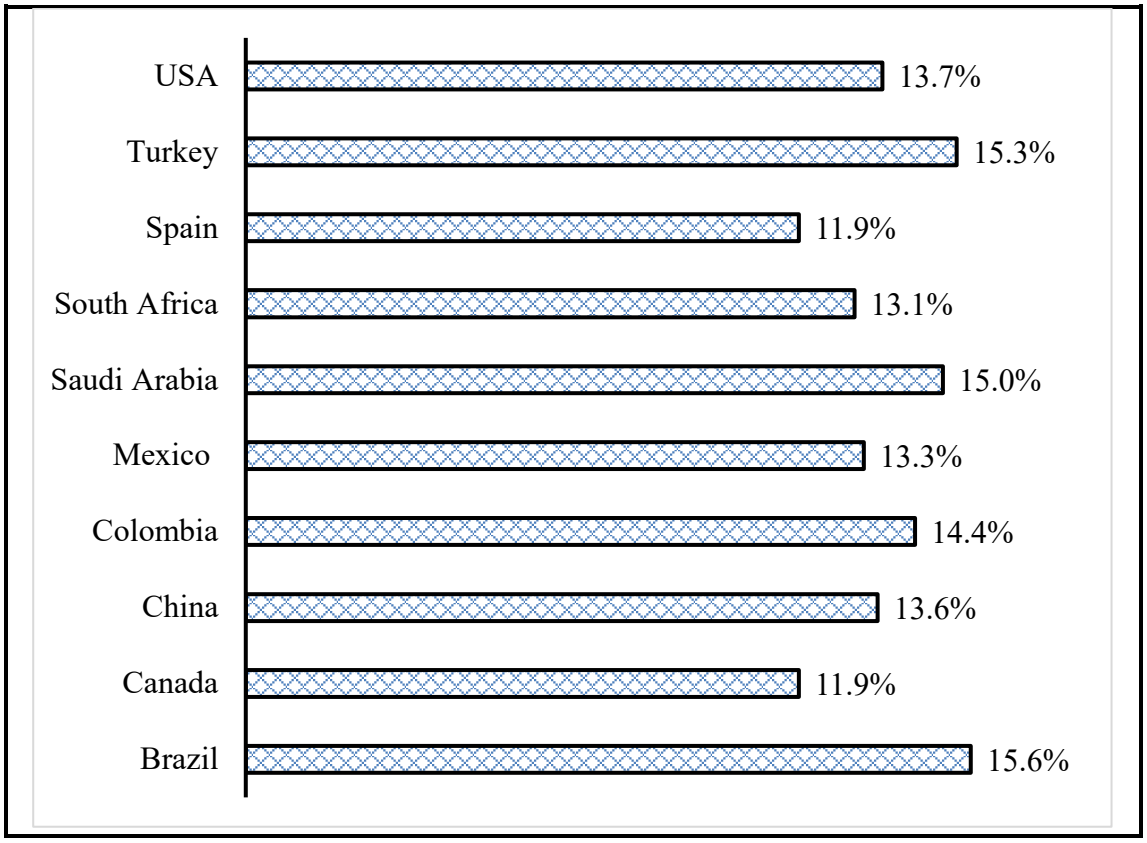
5.2 Cybercrime is impacting users across the globe. As individuals and businesses increasingly rely on internet-connected devices, malicious attackers continue to take advantage. The column graph below shows the percentage budget allocated to security by country.



Use the information provided in the graph to answer the questions that follow.

5.2.1 Calculate the mean budget allocated to security by countries. (2)

5.2.2 Name the modal countries. (2)

5.2.3 Determine the range budget allocated to security by country. (2)

5.2.4 What is the median of the given data set? (2)

5.2.5 Do you think the average budget allocated to security by countries in QUESTION 5.2.1 is accurate? Give a reason for the answer. (3)

5.2.6 Determine the sample size of the survey. (2)

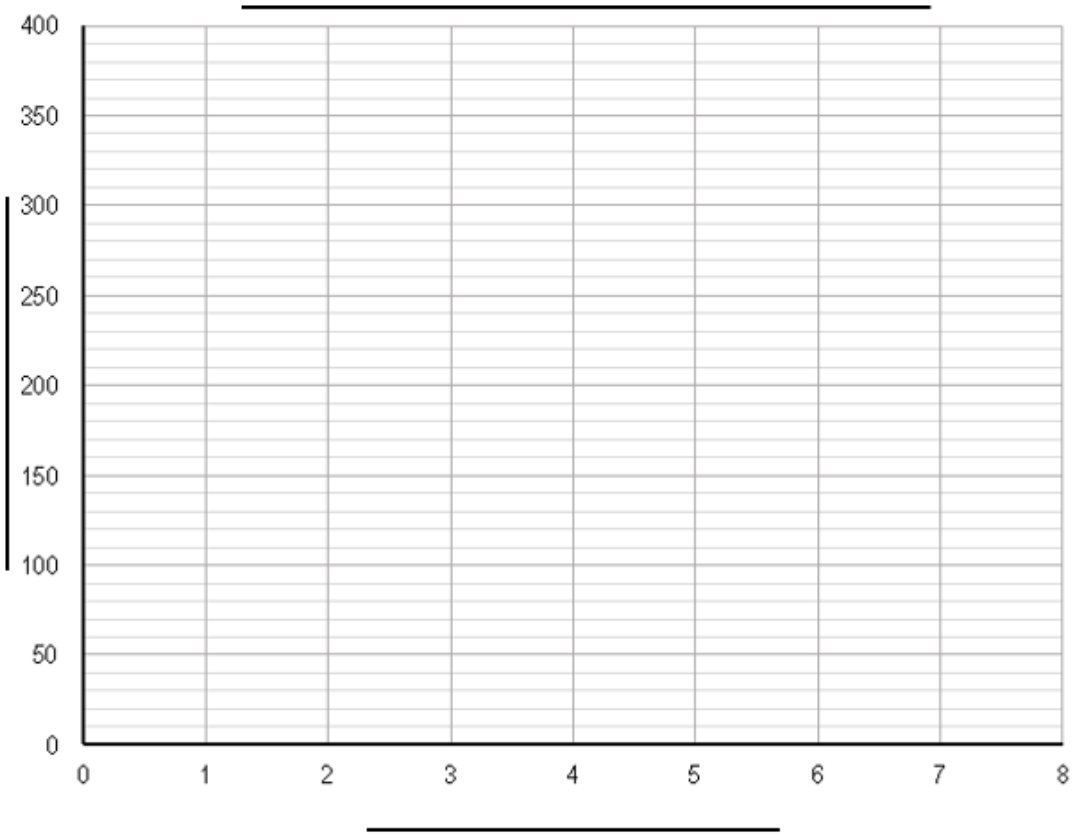
[30]

TOTAL: 150

ANSWER SHEET EXAMINATION NUMBER:

QUESTION 4

4.3.4



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