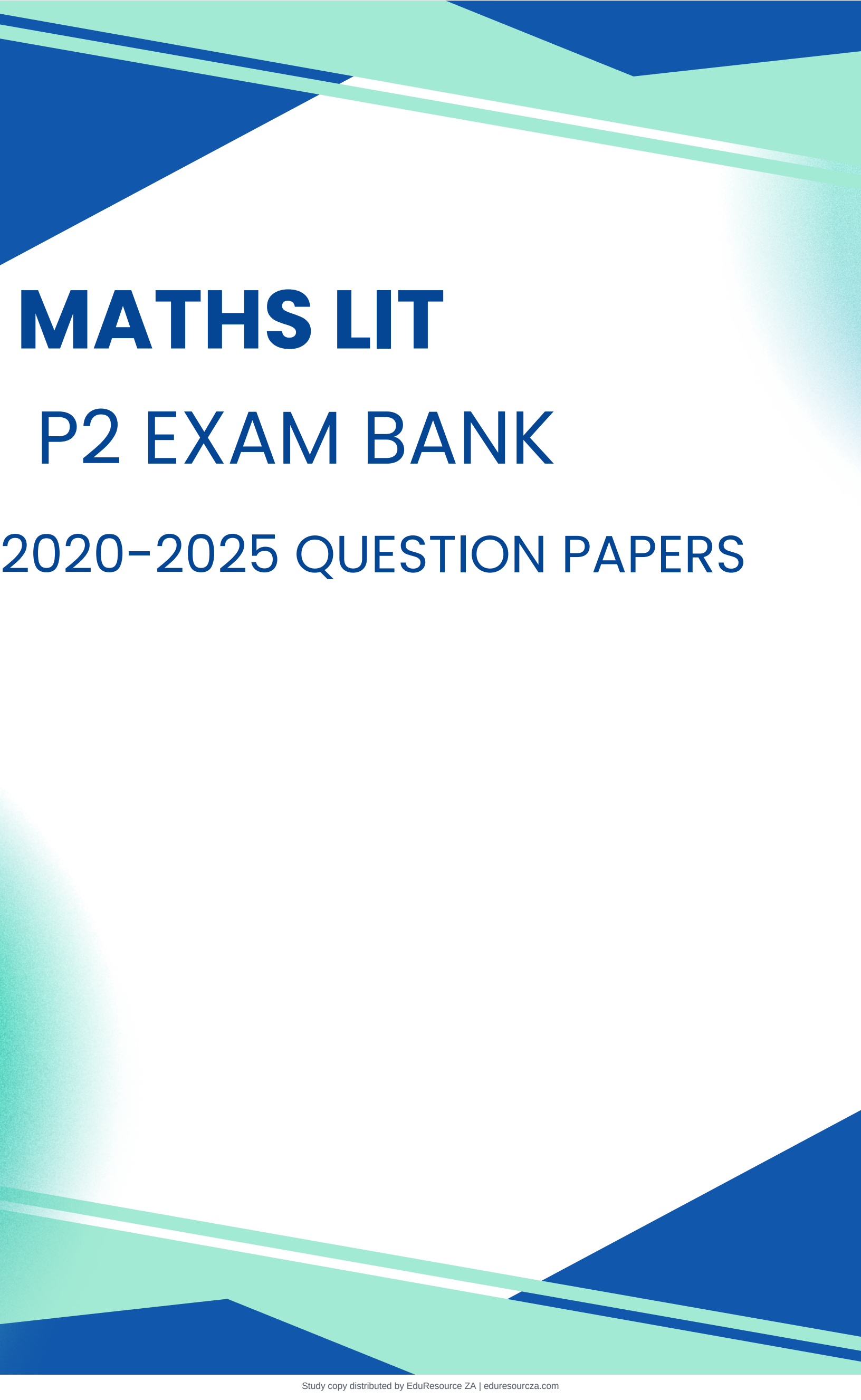




MATHS LIT

P2 EXAM BANK

2020–2025 QUESTION PAPERS



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE/ NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2020

MARKS: 150

TIME: 3 hours

**This question paper consists of 10 pages,
1 answer sheet and an addendum with 4 annexures.**

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. 2.1 Use the ANNEXURES in the ADDENDUM to answer the following questions:
 - ANNEXURE A for QUESTION 2.1
 - ANNEXURE B for QUESTION 2.2
 - ANNEXURE C for QUESTION 3.2
 - ANNEXURE D for QUESTION 4.1
- 2.2 Answer QUESTION 4.2 on the attached ANSWER SHEET.
- 2.3 Write your centre number and examination number in the spaces 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.

QUESTION 1

1.1 Lindiwe is interested in early childhood education. She researched the number of learners enrolled in early childhood education in selected countries.

TABLE 1 shows the number of learners that were enrolled in early childhood education in selected countries.

TABLE 1: NUMBER OF LEARNERS ENROLLED IN EARLY CHILDHOOD EDUCATION BY COUNTRY FROM 2014 TO 2016

COUNTRY	2014	2015	2016
Bulgaria	240 622	241 123	232 025
Denmark	300 278	291 683	284 655
Germany	2 970 436	3 014 046	3 090 459
Ireland	78 056	71 096	82 245
Greece	231 155	225 596	214 109
Cyprus	N	29 669	30 505
Slovenia	83 700	84 750	85 407
Serbia	189 304	192 005	199 790
Turkey	1 064 190	1 158 826	1 221 165
Slovakia	158 195	161 906	163 740
United Kingdom	1 596 803	2 035 420	2 248 162
	-	-	-

[Adapted from appso.eurostat.ec/Europa.eu]

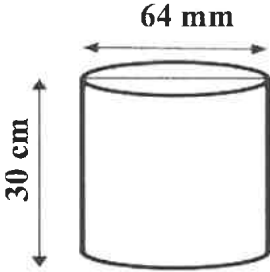
Use TABLE 1 to answer the questions that follow.

- 1.1.1 Determine the difference in the number of learners enrolled in Slovakia in 2015 and 2016. (3)
- 1.1.2 The range of the number of learners enrolled for 2014 is 2 947 664.
Calculate the value of N which represents the lowest number of learners enrolled for 2014. (3)
- 1.1.3 Describe the trend shown by the number of learners enrolled in Greece. (2)
- 1.1.4 Determine whether Turkey or the United Kingdom had the largest percentage increase from 2014 to 2016 regarding the number of learners enrolled in early childhood education. Show ALL your calculations. (6)
- 1.1.5 Determine (as a decimal fraction) the probability of randomly selecting a country in this table which shows a decline in enrolment from 2015 to 2016. (3)
- 1.1.6 The cost per child for early childhood education in Denmark in 2016 was €520,83 per month, while the comparative cost in Slovenia was €350 per month.

Lindiwe stated that the ratio of the total amount spent for all the learners enrolled in 2016 in Denmark compared to Slovenia is more than 5 : 1.

Verify her statement. (6)

1.2 Lindiwe bought two bags of dirty marbles from her neighbour at R30,00 per bag. Each bag contained 100 marbles. She intends to wash the marbles before selling them to her friends at school. She uses a cylindrical container to wash the marbles in, as shown in the diagram below.

DIAGRAM OF A CYLINDRICAL CONTAINER	BAG OF MARBLES
 (Not drawn to scale)	
Inner diameter = 64 mm Inner height = 30 cm	Volume of a single marble = 2 cm ³

You may use the following formulae:

Volume of a cylinder = 3,142 × radius² × height

Circumference of a circle = 3,142 × diameter

NOTE: 1 000 cm³ = 1 litre

Use the above information to answer the questions that follow.

- 1.2.1

Lindiwe made a profit of 120% from selling one bag of marbles.

Calculate, in rand, the selling price of EACH marble.

(4)
- 1.2.2

To wash the marbles, Lindiwe placed all the marbles from both bags into the cylindrical container. She then filled the container with water.

Lindiwe stated that more than half a litre of water was required to fill the cylindrical container with the marbles already inside it.

Verify, showing ALL calculations, whether the statement is valid.

(9)
- 1.2.3

Calculate, in cm, the outer circumference of the cylindrical container used to wash the marbles if the container is made of metal 0,5 mm thick.

(3)

[39]

QUESTION 2

2.1

After an examination, a total of 2 808 Mathematical Literacy scripts were marked at a particular marking centre.

TABLE 2 in ANNEXURE A shows data about the marking team, hours worked, tariffs and the amounts claimed for the marking and moderation of these scripts.

The marking process was planned as follows:

- The first day of marking was a Monday, starting at 14:00.
- Thereafter marking started at 08:00 and ended at 20:00 on a full marking day.
- Paid working hours excluded tea, lunch and supper breaks.

The marking team was paid a travel allowance of R3,26 per km for a total of 11 542 km travelled.

TABLE 3 below shows the times for actual marking and breaks for a full day.

TABLE 3: TIMES FOR ACTUAL MARKING AND BREAKS

START	TEA 1	LUNCH	TEA 2	SUPPER	FINISH
8:00	10:00–10:15	13:15–14:00	15:15–15:30	17:45–18:30	20:00

Use the above information and ANNEXURE A to answer the questions that follow.

- 2.1.1

Determine the total amount claimed by the chief moderator (CM) and the internal moderator (IM).

(3)
- 2.1.2

Calculate the value of **A** in TABLE 2.

(2)
- 2.1.3

Markers are allowed a maximum number of marking hours based on the following formula:

$$\text{Number of marking hours} = \frac{\text{Total number of scripts} \times 28}{\text{Number of markers} \times 60}$$

(a)

Using the above formula, determine the expected time and the day on which the markers are likely to finish marking.

(6)

(b)

Determine the actual day and time when markers finished, according to the hours claimed, if marking started at 14:00 on Monday.

(4)

(c)

Give ONE possible reason why the markers finished before the expected time.

(2)
- 2.1.4

A total amount of R400 000 was budgeted for the marking team at this particular marking centre.

Verify whether this amount would be sufficient to pay the team for transport, marking and moderation of the scripts.

(6)

2.2

The IM and CM were allocated tables with semicircular-shaped table tops, as shown in the picture below. Lumka, the centre manager, explained that two semicircular table tops are made from one square piece of wood.

TABLE WITH A SEMICIRCULAR TOP



The information on how the semicircular tops are cut from the square piece of wood is in ANNEXURE B. The dimensions of the wood are 2,7 m × 2,7 m with a thickness of 38 mm.

You may use the following formulae:

Area of a square = side × side

Area of a semicircle = $\frac{3,142 \times \text{radius}^2}{2}$

Volume of a rectangular prism = length × width × height

Use the information above and ANNEXURE B to answer the questions that follow.

2.2.1 Lumka stated that 2,01 m² of the wood is cut off when making two semicircular-shaped table tops from one piece of wood.

Verify, showing calculations, whether Lumka's statement is valid. (8)

2.2.2 The wood used is sold for R1 215 per cubic metre, excluding VAT at 15%.

Calculate the total cost, including VAT, of the wood to make 12 semicircular table tops. (7)

[38]

QUESTION 3

3.1 A group of students at a nursing college wrote two tests for the same course. TABLE 4 shows the test scores, as percentages, of the students.

TABLE 4: TEST RESULTS, AS PERCENTAGES, OF THE STUDENTS

TEST	STUDENTS																	
	Paul	Oscar	Helen	Elsie	Fiona	Ian	Linda	Beauty	Charl	Rose	Kevin	Danie	Neo	Joan	Goitse	Mangi	Zena	Anita
1	89	90	87	90	83	83	94	73	88	Y	97	95	95	86	73	73	84	63
2	50	52	57	61	61	63	65	65	66	67	67	68	70	71	75	78	79	79

[Adapted from www.sanc.gov.za]

A student who scores 85% or more for a test is awarded a distinction.

Use the information in TABLE 4 to answer the questions that follow.

- 3.1.1 Explain, giving a reason, whether the above data is discrete or continuous. (3)
- 3.1.2 Determine the median score for Test 2. (3)
- 3.1.3 The mean score for Test 1 was 84%. Calculate the value of Y. (4)
- 3.1.4 Identify the candidates whose test scores in both tests differed by 30%. (3)
- 3.1.5 Calculate the value of the interquartile range for Test 2. (4)
- 3.1.6 Express, in simplified fractional form, the probability of randomly selecting a candidate who did not get a distinction for Test 1. (3)
- 3.1.7 Determine the modal test score for Test 1. (2)

3.2 Mangiwe, one of the students at the nursing college, visited the Ambleside town centre and stayed at the Queens Hotel for one week.

The Ambleside town centre map is given in ANNEXURE C.

Use ANNEXURE C to answer the questions that follow.

3.2.1 Identify the road in which parking is not allowed. (2)

3.2.2 Mangiwe travels from Keswick to Rydal Road.

Give ONE reason why she cannot turn right into Compston Road. (2)

3.2.3 Give the general direction of the Queens Hotel from the tennis courts. (2)

3.2.4 On the map, **X** is a point at the information centre and **Y** is a point at the University of Cumbria.

Use the scale on the map to calculate, in yards, the straight-line distance from **X** to **Y**. (4)

3.2.5 Mangiwe parked in Church Street from 12:00 to 15:25. A traffic officer who monitors the area issued her with a fine.

NOTE: A fine is the amount of money that someone has to pay if there is an offence.

(a) Write down for which offence the traffic officer issued her with a fine. (2)

(b) Mangiwe was fined £79,75 by the traffic officer.

Calculate, to the nearest £, the rate per hour for this fine. (5)
[39]

QUESTION 4

4.1 Keitumetse is a South African student who is on holiday in Australia. He went to the Lawrence Theatre to attend a musical concert.

ANNEXURE D shows the seating arrangements of the Lawrence Theatre.

TABLE 5 shows the single ticket prices for a visit to the theatre, in Australian dollar (inclusive of Australian VAT of 10%).

TABLE 5: COST OF A SINGLE TICKET IN AUSTRALIAN DOLLAR

FRIDAY AND SATURDAY		THURSDAY AND SUNDAY	
Adult	\$34,70	Adult	\$28,60
Student	\$30,50	Student	\$26,40
Children (14 and younger)	\$17,60	Children (14 and younger)	\$17,60

[Adapted from: <https://www.theatrelawrence.com>]

Use ANNEXURE D and the above information to answer the questions that follow.

4.1.1 Determine, as a percentage, the probability of randomly selecting an odd numbered seat for a disabled person from all the seats in the theatre. (3)

4.1.2 Identify the row and seat number for a person who is seated as follows: (2)

- In Section B
- Fourth row from the stage
- In the middle seat

4.1.3 Keitumetse is seated in D7 of Section A. He has to assist his friend in A11 after the show. (4)

Describe the shortest possible path he would follow to reach A11.

4.1.4 Sections A to C had the following number of people attending on a Thursday.

	ADULTS	STUDENT	CHILDREN (14 AND YOUNGER)
Section A	53	15	9
Section B	57	32	15
Section C	40	10	9

There was a claim that an amount of exactly \$5 796, excluding Australian VAT, was collected on that day.

Verify, with calculations, whether this claim is CORRECT. (8)

4.1.5 Keitumetse bought a ticket for a Friday show.

Calculate how much the ticket costs in South African rand.

Use the exchange rates below.

EXCHANGE RATE		
1 Australian dollar (AUD)	=	0,71 United States dollar (USD)
1 United States dollar (USD)	=	14,43 South African rand (ZAR)

(3)

4.2

While in Australia, Keitumetse studied the inflation rate.

The attached ANSWER SHEET shows graphs and data regarding the monthly inflation rate for 2017 and 2018 in Australia.

NOTE: The 2017 graph is incomplete; however, the 2018 graph is complete.

Use the information on the ANSWER SHEET to answer the questions that follow.

4.2.1 Complete the FIVE missing bars for 2017 on the ANSWER SHEET. (5)

4.2.2 Comparing 2017 with 2018, state the month in which the difference in the inflation rate was the greatest and calculate this difference. (3)

4.2.3 Keitumetse noted the trend in the inflation rate from the end of October 2018 to the end of December 2018.

He then stated that a car costing AUD156 831,36 at the end of October 2018 would cost AUD6 500 more in January 2019.

Verify, showing ALL calculations, whether his statement is CORRECT. (6)
[34]

TOTAL: 150



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

2021

MARKS: 150

TIME: 3 hours

This question paper consists of 11 pages and an addendum with 3 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
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ANNEXURE B for QUESTION 3.2
ANNEXURE C for QUESTION 4.2
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QUESTION 1

1.1

Aggie and 14 friends started a stokvel in order to buy groceries. The grocery items bought will be shared equally among all the members of the stokvel. Aggie sourced prices from two wholesalers, **A** and **B**, for the items they intend buying.

TABLE 1 below shows the comparison of the prices, excluding VAT, of items she needs to buy. (Some values have been omitted.)

TABLE 1: PRICES OF ITEMS AT WHOLESALERS FOR JANUARY 2020

ITEM DESCRIPTION (packaging detail)	QUANTITY (as per packaging detail)	WHOLESALER A	WHOLESALER B
		TOTAL AMOUNT	TOTAL AMOUNT
Cake flour (12,5 kg)	15	R1 274,85	R1 334,25
Maize meal (5 kg)	30	R689,70	R659,70
Rama 125 g (48 in a packet)	15	R4 154,85	R3 899,85
# Rice (10 kg)	15	R1 679,85	R1 814,85
# Canned fish (12 cans × 400 g)	10	R1 559,50	R1 699,00
# Long-life milk (6-pack of 1 ℓ)	15	R1 049,85	R1 154,85
Spice (10 × 50 g)	15	R1 499,85	R1 439,85
VAT (15%)		...	R1 100,05
Total including VAT		...	R13 102,40

NOTE: # – means items that are VAT exempted
1 ℓ ≈ 1 kg

Use the information and TABLE 1 above to answer the questions that follow.

- 1.1.1

Write down how many cans of fish each member of the stokvel will receive.

(3)
- 1.1.2

Aggie stated that she could load all these items onto her half-ton bakkie without overloading it.

Verify, showing ALL calculations, whether her statement is valid.

(7)
- 1.1.3

Determine, showing ALL calculations, which wholesaler (**A** or **B**) will be cheaper if she buys all the items (including VAT) from one wholesaler.

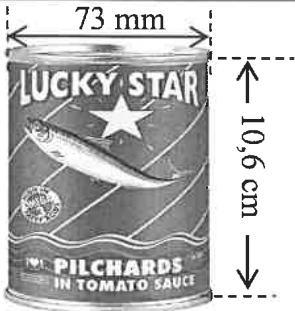
(7)
- 1.1.4

The food inflation rate was 5,17% in January 2021 and is estimated to be 5,3% in January 2022.

Calculate the total amount for 5 kg of maize meal from Wholesaler **B** at the end of January 2022.

(5)

1.2 Below is a picture of a cylindrically shaped 400 g can of fish. The can is fully covered by a label with dimensions as shown in the picture.

Picture of the label on a can of fish	Dimensions of the label on the can
	Diameter = 73 mm Height = 10,6 cm

You may use the following formulae:

Circumference of a circle = diameter × 3,142
Surface area of the label around the can = circumference × height

Use the information above to answer questions that follow.

- 1.2.1

(a)

Calculate (in cm²) the surface area of the label around the can.

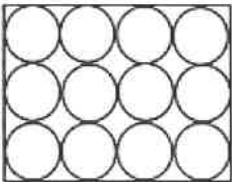
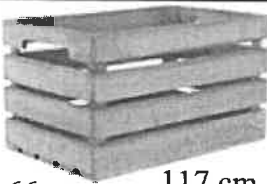
(4)

(b)

Determine the total length of a label if an overlap of 0,6 cm is needed for it to be glued around a can.

(2)
- 1.2.2

Some of the cans of fish are imported by ship. The cans of fish are wrapped in packs of 12.

Wrapped pack of 12 cans of fish	Top view of a pack of 12 cans	Shipping crate
		

- Dimensions of a pack of 12 cans:
- Length: 29,2 cm
 - Width: 21,9 cm
 - Height: 10,8 cm

The mass of an empty can is 40 g.
The mass of a fully packed shipping crate with cans of fish is 280 kg.
The inner dimensions of a shipping crate are 117 cm by 66 cm by 50 cm.
Packs of cans are placed lengthwise (length to length) in the shipping crates.

Aggie stated that an empty shipping crate has a mass of less than 20 kg.

Verify, with calculations, if her statement is valid.

(9)
[37]

QUESTION 2

2.1

Tumi received a bursary to study at the University of Victoria in Canada. She travelled from the University of Victoria to Victoria Downtown.

ANNEXURE A shows the map and two routes she could have used to travel on.

A summary of the route via Cadboro Road and Pandora Avenue [12 min. (6,8 km)] she used (with some information missing) is listed below.

SUMMARY OF THE ROUTE

Section	Description of her journey
1	Head ... on Cedar Hill Cross Road towards Crestview. Drive 190 m.
2	Turn right onto Cadboro Road. Drive 3,2 km.
3	Continue onto Fort Street. Drive ... km.
4	Slight right onto Pandora Avenue. Drive 2,1 km. You have reached your destination.

Use ANNEXURE A and the information above to answer the questions that follow.

- 2.1.1

In which general direction did she head from Cedar Hill Cross Road towards Crestview?

(2)
- 2.1.2

Determine the distance that she travelled on Fort Street.

(3)
- 2.1.3

Name the road she travelled on after crossing Flower Street.

(2)
- 2.1.4

Calculate (in km/h) the average speed she travelled.

You may use the formula:

Distance = Speed × Time

(4)
- 2.1.5

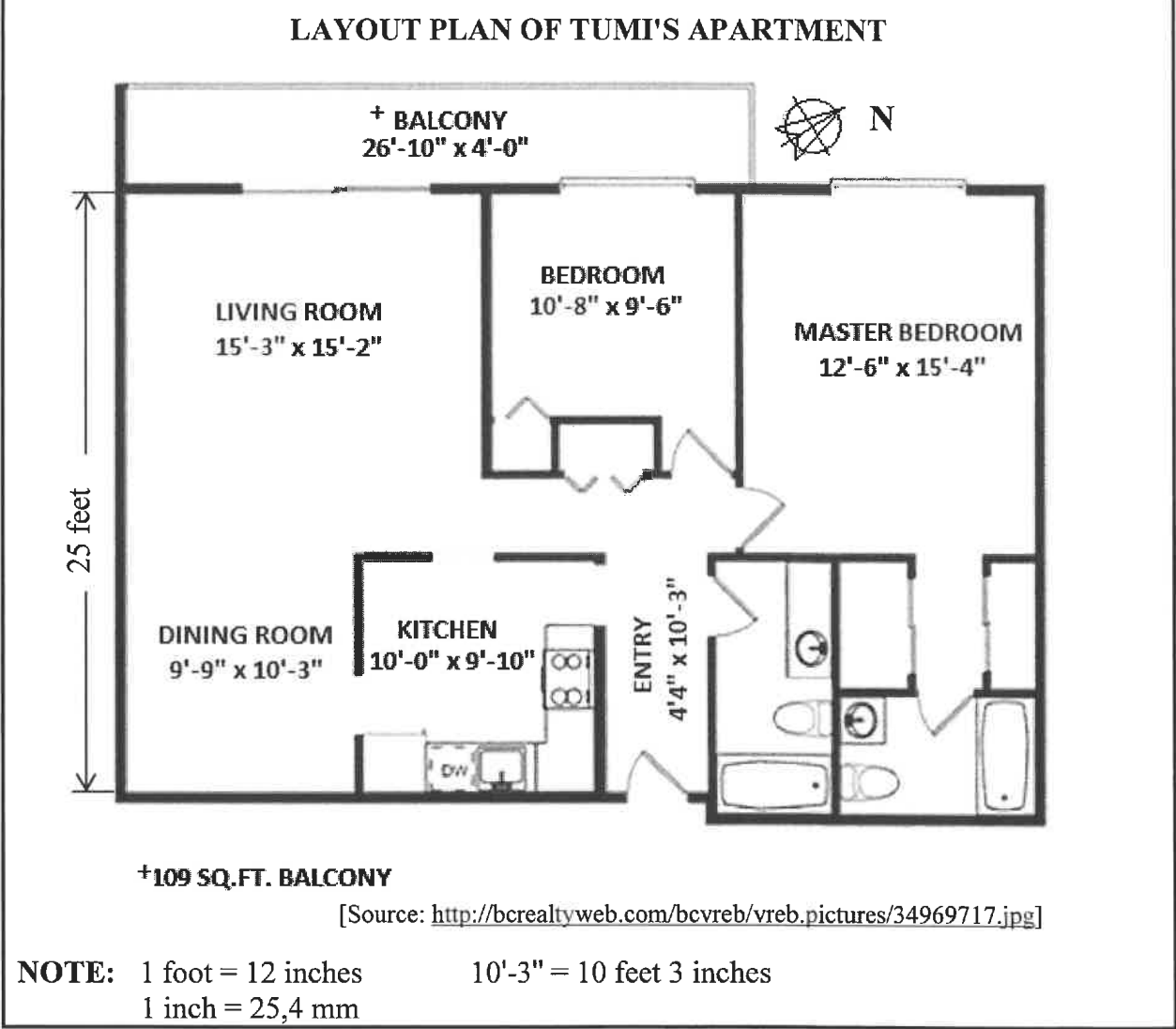
On another day, Tumi travelled from the University of Victoria to Victoria Downtown via Shelburne at an average speed of 36,5 km/h.

Calculate (in metres) the difference between the distances of the two routes.

(3)

2.2 Tumi rented a 1 045 square feet apartment while she was studying.

Below is a layout plan of the apartment. The dimensions are given in feet and inches.



Use the information above to answer the questions that follow.

2.2.1 Verify, showing ALL calculations, whether the balcony with dimensions 26 feet 10 inches by 4 feet is greater or less than 109 square feet.

You may use the formula:

Area of a rectangle = length × width (6)

2.2.2 The southwest-facing wall, excluding the balcony, is 25 feet. Measure this distance on the layout plan to determine the scale in the form 1 cm : ... feet. (3)

2.2.3 Tumi's monthly rent for her apartment is C\$2 188,71 (C\$ is Canadian dollar).

Calculate the rental rate per square feet. (3)

2.3

A rental price ratio is used to calculate whether it is cheaper to rent or buy a property.

This ratio is calculated as follows:

$$\text{Rental price ratio} = \frac{\text{Average property price}}{\text{Average annual rent}}$$

This ratio is generally classified into three categories:

- **Low (15 and below):** better to buy than to rent
- **Moderate (15,1 to 20):** usually better to rent than to buy
- **High (20,1 and above):** definitely better to rent than to buy

Use the above information to answer the questions that follow.

2.3.1

The average house price is C\$300 000 and the price to rent is C\$6 000 per quarter.

Advise Tumi, showing ALL calculations, whether she should rent or buy a property.

(4)

2.3.2

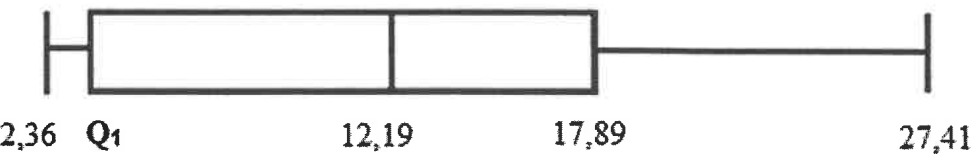
The following are rental price ratios of selected **North American** cities:

2,11	3,62	4,24	4,24	4,68	5,62	5,87
6,44	6,52	7,20	7,59	7,64	7,64	7,69
8,32	8,41	8,72	9,11	11,08	13,85	15,26

The following are rental price ratios of selected **South Asian** cities:

16,68	12,00	42,80	12,55	7,00	10,82
8,55	13,56	7,07	29,86	27,71	6,84

The rental price ratios of selected cities in **Africa** are illustrated in the box and whisker plot below.



Use the above information to answer the questions that follow.

- (a)
- Determine, in simplified fractional form, the probability of randomly selecting a South Asian city classified as high.
- (3)
- (b)
- Determine the value of Q_1 (the 1st quartile) if the interquartile range (IQR) for Africa is 14,25.
- (3)
- (c)
- Comment on the possibility of owning a property in these areas by comparing the minimum, maximum and median values for North America and Africa.
- (5)

[41]

QUESTION 3

3.1

TABLE 2 shows data for South African assessed taxpayers for the 2018 tax year.

TABLE 2: TAXPAYERS BY INCOME GROUP AS ASSESSED FOR 2018

Taxable income group	Taxpayers		Taxable income		Tax assessed	
	Number	%	Amount (R million)	%	Amount (R million)	%
Less than R1	127 428	2,6%	-16 302	-1%	2	0,0%
R1 to R70 000	400 133	8,1%	15 030	0,9%	16	0,0%
R70 001 to R350 000	2 856 043	58,1%	577 196	34,8%	59 961	16,8%
R350 001 to R500 000	717 157	14,6%	297 012	17,9%	55 464	15,6%
More than R500 000	816 268	16,6%	783 526	47,3%	240 756	67,6%
Total	4 917 029		C		356 199	

[Adapted from SARS and BusinessTech.co.za]

Use the above data to answer the questions that follow.

3.1.1 Calculate missing value C. (2)

3.1.2 Determine, to THREE decimal places, the probability of randomly choosing an assessed taxpayer if South Africa's population was 57,73 million in 2018. (4)

3.1.3 Calculate, in rand, the mean monthly taxable income per taxpayer in the R70 001 to R350 000 taxable income group. (5)

3.1.4 In the table, the percentage for tax assessed is 0,0% for the taxable income group R1 to R70 000.

Explain, showing calculations, how this percentage was obtained. (4)

3.2

Emily earns a monthly gross salary of R26 904,22. She pays 7,5% of her gross salary towards her pension fund. In South Africa, taxable income is gross income minus payments towards a pension fund.

3.2.1 Calculate Emily's annual taxable income. (4)

3.2.2 The VAT rate in March 2018 was 14%. This rate was increased to 15% in April 2018.

Emily bought an item, including VAT, for R172,50 in April 2018.

Calculate the March 2018 price of this item, including VAT. (4)

3.2.3 ANNEXURE B shows the distribution of assessed taxpayers and income tax per province represented by arrows.

Use ANNEXURE B to answer the questions that follow.

(a) Arrange the provinces in descending order of tax assessed. (4)

(b) Give a reason why all these arrows have different lengths. (2)

(c) Emily stated that when comparing the lengths of the arrows of the North West and Free State, they varied proportionally according to the tax-assessed percentage.

Verify whether her statement is valid. (3)
[32]

QUESTION 4

4.1

The South African taxi association, Transaction Capital, published its results for the current state of the South African minibus taxi industry for the year ended September 2019. A summary of the results are as follows:

- 250 000 minibus taxis are currently doing business in South Africa.
- The net worth of the minibus taxi industry is R50 billion a year.
- Minibus taxis are responsible for 15 million commuter trips daily.
- Minibus taxis travel 19 billion kilometres a year.

[Source: TCP HY19 Results analysis booklet]

Transaction Capital is interested in entering the European market.

Below are two exchange rates quoted at different times of the day:

Exchange Rate A: 1 euro = 15,97 ZAR

Exchange Rate B: 1 euro = 15,966728 ZAR

Use the information above to answer the questions that follow.

4.1.1 It is given that there is one bus for every 13,2 minibus taxis on the road.

Determine, to the nearest thousand, the number of buses needed to replace the minibus taxis.

(3)

4.1.2 Transaction Capital plans to present a business model to a group of European businessmen.

(a) Calculate (in euros) the difference in net worth of the minibus taxi industry using exchange rates A and B.

(6)

(b) Justify which exchange rate (A or B) they should use when doing the presentation to their European clients.

(3)

4.1.3 The ratio of the number of daily commuter trips is given as follows:

train : bus : minibus taxi is 4 : 5 : 75

Calculate the number of commuters who do NOT use a minibus taxi daily.

(4)

4.1.4 The average distance between the moon and Earth is 384 402 km.

A minibus taxi owner stated that the distance travelled by minibus taxis in one year is more than 24 000 trips to the moon and back.

Verify, showing ALL calculations, whether the statement is valid.

(5)

4.2

Transaction Capital is listed on the Johannesburg Securities Exchange (JSE).

(A securities exchange is a place where investors buy and sell the shares of a company in a regulated and legitimate space.)

ANNEXURE C shows the share price of Transaction Capital for the period 9 January 2015 to 3 January 2020.

(Shares are units of ownership interest in a company or financial asset that provide for an equal distribution of profits.)

Use ANNEXURE C and the information above to answer the questions that follow.

- 4.2.1 Write down the total number of days covered by the period shown in ANNEXURE C. (4)
- 4.2.2 Determine (in cents) the value of a share on 9 January 2015 if it was R12,68 less than the amount shown on 3 January 2020. (2)
- 4.2.3 Verify, showing calculations, whether the following statements are CORRECT:
- (a) Transaction Capital's share price went down by 3,51% for the day ending 3 January 2020. (5)
- (b) At the beginning of each year 80% of the time, share prices went down. (3)
- 4.2.4 Calculate (in rand) the profit a person will make if he/she bought 5 000 shares at the 52-week lowest price and sold them when the price was at its highest. (5)
- [40]
- TOTAL: 150**



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Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

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GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2021

MARKS: 150

TIME: 3 hours

This question paper consists of 14 pages and an addendum with 4 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

ANNEXURE A for QUESTION 2
ANNEXURE B for QUESTION 4.1
ANNEXURE C for QUESTION 4.3.3
ANNEXURE D for QUESTION 5.1
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 drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1

Gadibolae bought Pringles (chips in a cylindrical container) on promotion at a shop. The promotion advertisement is shown below, together with a diagram of the Pringles container with dimensions.

PROMOTION ADVERTISEMENT FOR PRINGLES

6 Pringles for R100,00



**Pringles
110 g each**

Promotion available:
From 11 Jan. 2021 to 31 Mar. 2021

**DIMENSIONS OF THE
CYLINDRICAL PRINGLES
CONTAINER**



Diameter = 64 mm
Height = 230 mm

[Source: guzzle.co.za]

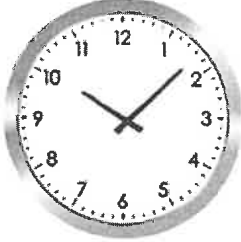
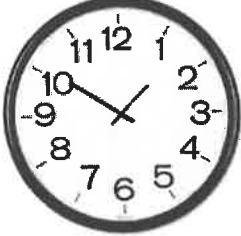
Use the information above to answer the questions that follow.

- 1.1.1 Determine (in grams) the total mass of the Pringles promotion bought for R100. (2)
- 1.1.2 Write down the radius of a single Pringles container. (2)
- 1.1.3 Choose the letter of the answer that will make the following statement TRUE.
- The unit to calculate the inner volume of a Pringles container is:
- A. mm^3
B. mm^2
C. $64 \times 23 \text{ mm}^2$ (2)
- 1.1.4 Determine the total number of days this promotion is available. (3)
- 1.1.5 Calculate the price of two 110 g Pringles containers in this promotion. (2)

- 1.2
- Paul has entered a motorcycle race. The digital clock in QUESTION 1.2.1 shows the time he finished the race.

The odometer in QUESTION 1.2.2 shows the reading as the motorcycle crossed the finishing line.

Choose an item from COLUMN B to complete the statements in COLUMN A. Write only the letter (A–E) next to the question numbers (1.2.1 and 1.2.2), e.g. 1.2.3 F.

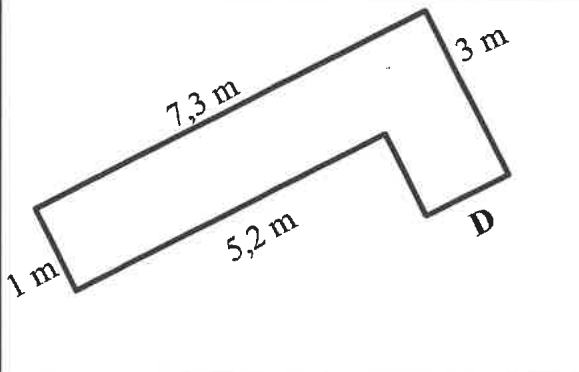
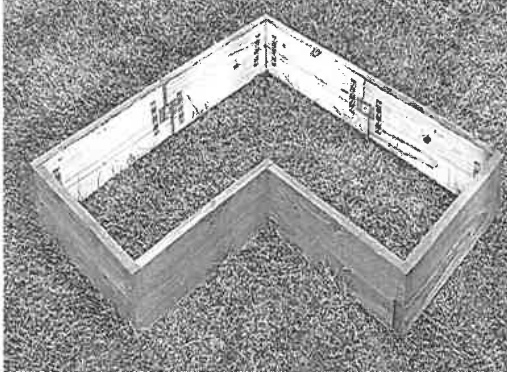
COLUMN A	COLUMN B
1.2.1 The analogue clock that shows the same time as the digital clock below, is ... 	A  B 
1.2.2 Given the following odometer:  Paul's speed is ...	C 55 km/h D 60 km/h E 680 003 km/h

(2)

(2)

1.3

A wooden L-shaped flower bed is filled with soil. Below is the L-shaped flower bed with dimensions, with **D** as a missing length.

DIMENSIONS OF THE L-SHAPED FLOWER BED	PICTURE: L-SHAPED FLOWER BED
	

[Source: plantsforafrica.com]

NOTE: All corners are right angles.

Use the information above to answer the questions that follow.

1.3.1 Convert the longest dimension of the L-shaped flower bed to cm. (2)

1.3.2 Calculate the missing length, **D**. (2)

1.3.3 The volume of the flower bed with materials can be calculated as follows:

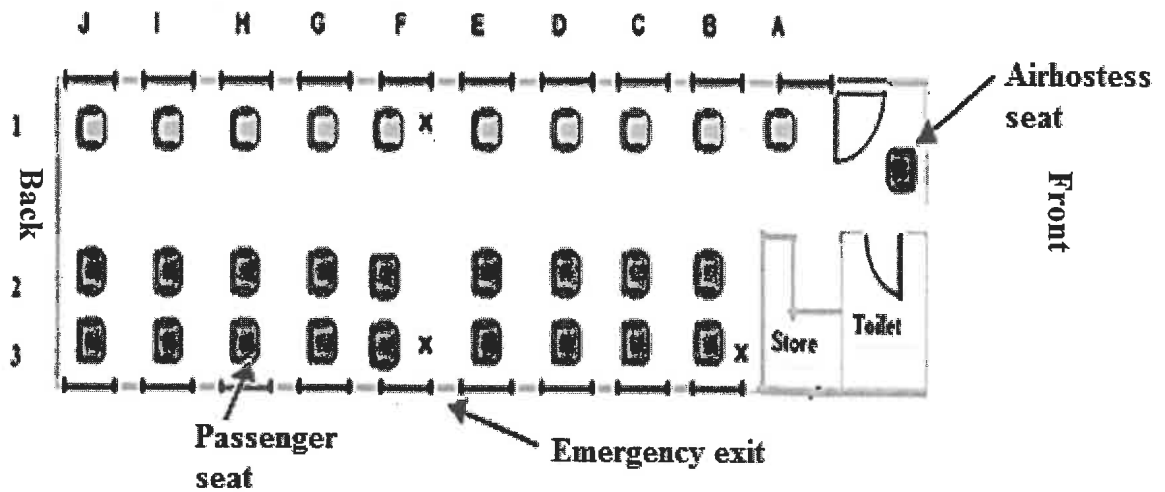
$$\text{Volume} = (2,1 \text{ m} \times 3 \text{ m} \times 0,5 \text{ m}) + (5,2 \text{ m} \times 1 \text{ m} \times 0,5 \text{ m})$$

$$= 3,15 \text{ m}^3 + 2,6 \text{ m}^3 = 5,75 \text{ m}^3$$

State which value in the above calculation represents the height of the flower bed. (2)

1.4

Below is the layout plan of the inside cabin of a small aeroplane. All the passenger seats face the front except the seat of the airhostess. On all flights there will be an airhostess.

[Adapted from www.airlink.com]

Use the information above to answer the questions that follow.

- 1.4.1 Explain the meaning of a *layout plan*. (2)
- 1.4.2 Calculate the maximum number of passenger seats available in this aeroplane. (2)
- 1.4.3 Stofile is seated in D1. He gets out of his seat and walks past his seat and two more seats towards the back to talk to his friend who is seated on Stofile's right-hand side.
- Using the same notation as Stofile's seat, write down the seat number of his friend. (2)
- 1.4.4 During the flight, passengers are allowed to choose a light snack and a drink. The choices are as follows: a muffin or a sandwich with a cola, a juice or bottled water.
- Write down the number of options they can choose from. (2)

[29]

QUESTION 2

ANNEXURE A shows the floor plan of Jan's house, with a veranda*, in South Africa.

**A veranda, also known as a porch or 'stoep', is an open area with a roof over it.*

The following is an artist's drawing of one of the elevations of Jan's house.



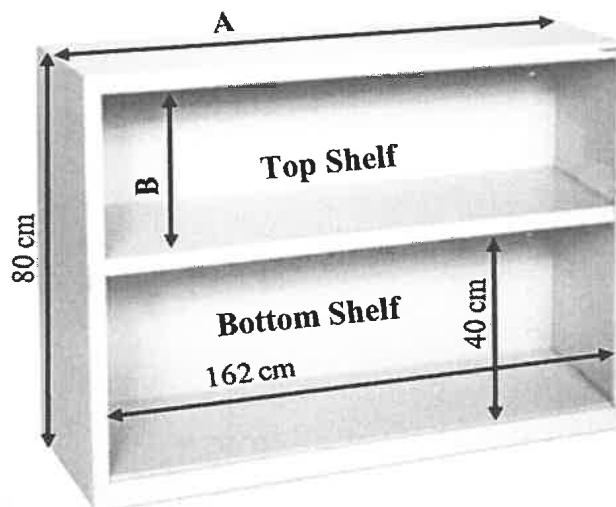
Use ANNEXURE A and the information above to answer the questions that follow.

- 2.1 Write down the number of bedrooms on the floor plan. (2)
- 2.2 Which room will be the first room you will enter from the veranda? (2)
- 2.3 In which general direction does the master bedroom window face? (2)
- 2.4 One of the door locks needs to be changed.
Write down the probability, in simplified fractional form, that it is NOT one of the interior doors. (4)
- 2.5 Jan remarked that the kitchen gets a lot of sunlight.
Critically comment on his remark. (3)
- 2.6 Give ONE reason why the windows shown in the above drawing do NOT represent the windows of the kitchen and the dining room. (2)

- 2.7 The scale used for the floor plan is 1 cm representing 1 000 mm in real life.
- 2.7.1 Write the given scale in number scale format. (2)
- 2.7.2 Measure the inner length of bedroom 2 and use the given scale to calculate the actual length (in m) of bedroom 2. (4)
- 2.7.3 Jan stated that the given scale is NOT very accurate to use if photocopies were going to be made of the plan.
- Critically comment on his statement and give a reason for your answer. (3)
- [24]**

QUESTION 3

Tsidi needs a bookshelf to store her files. She decides to buy a second-hand wooden bookshelf with two shelves, as illustrated below.

**DIMENSIONS:**

Inside width 162 cm

Total outside height 80 cm

Inside height of the
bottom shelf 40 cm

NOTE:

Area of a rectangle = length $\times$ width

Use the information above to answer the questions that follow.

3.1 The top shelf has a thickness of 1,5 cm all around.

3.1.1 Determine A, the outside length of the bookshelf.

(3)

3.1.2 The base of the bottom shelf is 4,5 cm thick.

Determine B, the inside height of the top shelf.

(3)

3.2 The total outside height of the bookshelf is 31,496 inches.

Determine (rounded to TWO decimal places) the conversion factor for the height in the form **1 inch = ... cm**.

(3)

3.3 Tsidi bought the bookshelf at a discounted price because the backboard which covers the entire width and height of the bookshelf, needed painting. She decides to do the following:

- Remove the backboard.
- Paint the back of the backboard with a single coat of paint.
- Paint the front of the backboard with two coats of paint.
- Nail the backboard to the bookshelf.

3.3.1 Calculate (in cm^2) the area of one side of the backboard.

(2)

3.3.2 Convert the answer in QUESTION 3.3.1 to m^2 .

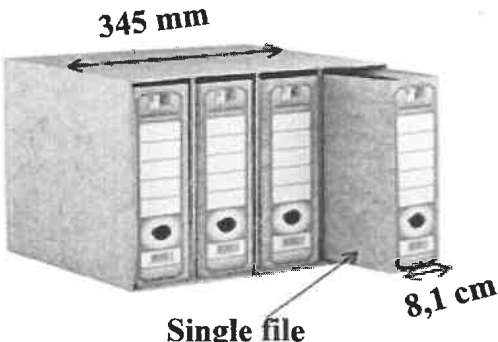
(2)

- 3.3.3 One litre of paint covers $6,9\text{ m}^2$.

Determine (rounded to TWO decimal places) the number of litres of paint required to paint the backboard completely. (5)
- 3.3.4 Tsidi stated that one 500 ml can of paint is sufficient to paint the backboard completely.

Verify, with calculations, whether her statement is valid. (3)

3.4

Tsidi wants to organise her documents in files. She was informed that you can store files separately (single files) or in a filing box as shown in the picture below.	
PICTURE OF A FILING BOX WITH FILES  345 mm 8,1 cm Single file	MEASUREMENTS A single file has a width of $8,1\text{ cm}$. The width of the filing box is 345 mm

Use the information above to answer the following questions.

- 3.4.1 Determine the maximum number of filing boxes that could fit on one shelf, which is 162 cm wide. (4)
- 3.4.2 Calculate the difference in the number of files that she can place on one shelf if she packs the shelf with single files rather than the filing boxes. (5)
- 3.4.3 Give a possible reason why Tsidi would prefer the filing boxes. (2)
- 3.4.4 Tsidi bought filing boxes to pack the top shelf completely. She could not remember in which file she placed a document. She randomly chooses one of the files out of the filing boxes. Determine, as a percentage to TWO decimal places, the probability that the file she chooses will contain the document she is looking for. (3)
- [35]

QUESTION 4

4.1

Mr Venter bought a farm in order to sell chickens and vegetables.
On ANNEXURE B is the layout plan of the farmyard.

Use ANNEXURE B to answer the questions that follow.

4.1.1 Name the feature on the layout plan which has an irregular shape. (2)

4.1.2 The letter J on the map represents Jojo tanks.

Give a reason why it is important to have a water tank at one's house. (2)

4.1.3 Jojo tanks are usually filled with rainwater.

Write down TWO structures where the water to fill a Jojo tank could possibly come from. (2)

4.1.4 Calculate (in m²) the area of the garden expansion.

You may use the following formula:

$$\text{Area of a triangle} = \frac{1}{2} \times \text{base} \times \text{height} \quad (3)$$

4.1.5 Mr Venter decides to replace the fence around the circular chicken site.
The circumference of the circular site is 18,852 m.

TWO COST OPTIONS FOR THE WIRE MESH	
OPTION A R1 154 for a 10 m roll	OPTION B R127,30 per running metre
 Picture of wire mesh	

By means of calculations, advise Mr Venter which option is more economical. (5)

4.2

One of the Jojo tanks on his farm has a 5 000 ℓ capacity. The height of the tank is 220 cm.

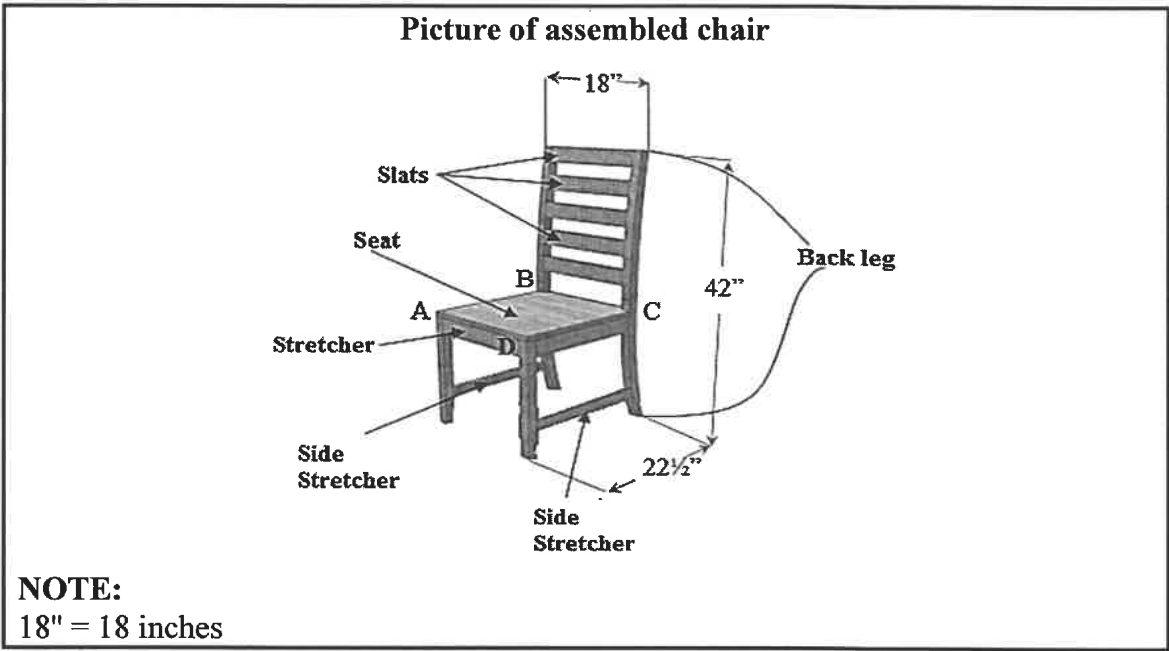
NOTE: 1 000 cm³ = 1 ℓ

Calculate (in cm) the radius of the tank.

You may use the following formula:

$$\text{Volume of a cylindrical tank} = 3,142 \times (\text{radius})^2 \times \text{height} \quad (6)$$

4.3 Mr Venter bought a chair which still has to be assembled. Below is a picture of the assembled chair showing different parts with some dimensions (in inches).



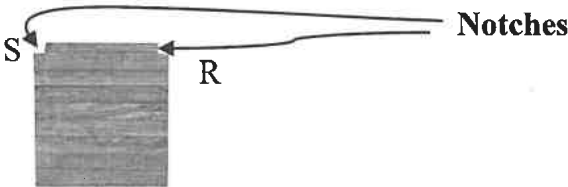
Use the information above to answer the questions that follow.

4.3.1 Write the following as a simplified ratio:
Width of the chair : height of the chair (2)

4.3.2 Convert the height of the chair to mm.
You may use the following conversions:
1 000 mm = 3,28084 feet and 12 inches = 1 foot (3)

4.3.3 ANNEXURE C shows pictures and written instructions for the first steps to assemble the chair.
Choose an assembly instruction from COLUMN B that matches a picture in COLUMN A. Write only the letter ((i) to (iii)) next to the question numbers (4.3.3(a) to 4.3.3(c)) in the ANSWER BOOK. (3)

4.3.4 State whether **P** or **Q** represents the side stretcher.
P  **Q**  (2)

4.3.5 The seat is shown in the sketch below.


Describe how you would position the seat so that it is attached to the rest of the structure. (Use the given letters A, B, C, D on the picture and S, R on the sketch).

(3)
[33]

QUESTION 5

5.1

Noah is a travelling salesman who lives in the United States of America (USA). He uses a map to estimate his travelling time between cities.

On ANNEXURE D is a partial map which shows the following:

- Various cities
- Distances (in miles) between cities
- Average travelling times (in hours and minutes) between these cities

Use ANNEXURE D to answer the questions that follow.

5.1.1 Choose ONE letter (W, X, Y or Z) that will make EACH of the following statements below TRUE.

- (a) The average time (in hours) to travel between Lee and Springfield is ...

W $\frac{50}{60}$

X $\frac{50}{100}$

Y 0,5

Z 41

(2)

- (b) Which city lies southeast of Boston?

W Providence

X Lowell

Y Gloucester

Z Plymouth

(2)

5.1.2 Noah found that the same time 01:05 is estimated for travelling from Providence to Boston and from Springfield to Worcester.

- (a) Write down the actual distances (in miles) from Providence to Boston and from Springfield to Worcester.

(3)

- (b) Give ONE possible reason why the map indicates the same travelling time for these two different distances.

(2)

5.1.3 Noah travelled from Portland passing three cities (A, B and C in the table) to reach his destination city, D.

TABLE 1 below shows the time taken to travel between various unknown cities indicated by A, B, C and D.

TABLE 1: TIME TAKEN BETWEEN CITIES

START CITY	DESTINATION CITY	TIME TAKEN BETWEEN CITIES
Portland	A	01:35
A	B	$\frac{1}{2}$ hour
B	C	00:35
C	D	1 hour

Name cities A, B, C and D. (4)

5.1.4 The fuel tank of Noah's car has a capacity of 23 gallons. Noah claims that in South Africa it will cost him less than R1 400 to fill up his fuel tank to capacity.

NOTE:

- 1 gallon = 3,785 litres
 - Fuel cost R15,97/ ℓ
- [Source: AA Petrol price on 2 March 2021]

Verify, with calculations, whether his claim is valid. (4)

5.1.5 Noah stays in Greenfield and travels to Fitchburg and back, from Monday to Friday. He fills his car's fuel tank on Monday morning. The fuel consumption of his car is 18 miles per gallon. He refuels his car to capacity as soon as he does not have enough fuel to complete a trip between the two cities.

Determine the number of gallons of fuel left in his car's tank on arrival in Greenfield on Friday afternoon. (8)

5.2 A temperature reading of -7°C was displayed on the screen on the dashboard of Noah's car. Determine (to the nearest ten) the temperature in degrees Fahrenheit.

Use the formula: $^{\circ}\text{C} = \frac{5}{9} \times (^{\circ}\text{F} - 32)$ (4)
[29]

TOTAL: 150



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REPUBLIC OF SOUTH AFRICA

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GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2022

MARKS: 150

TIME: 3 hours

This question paper consists of 14 pages and an addendum with 5 annexures.

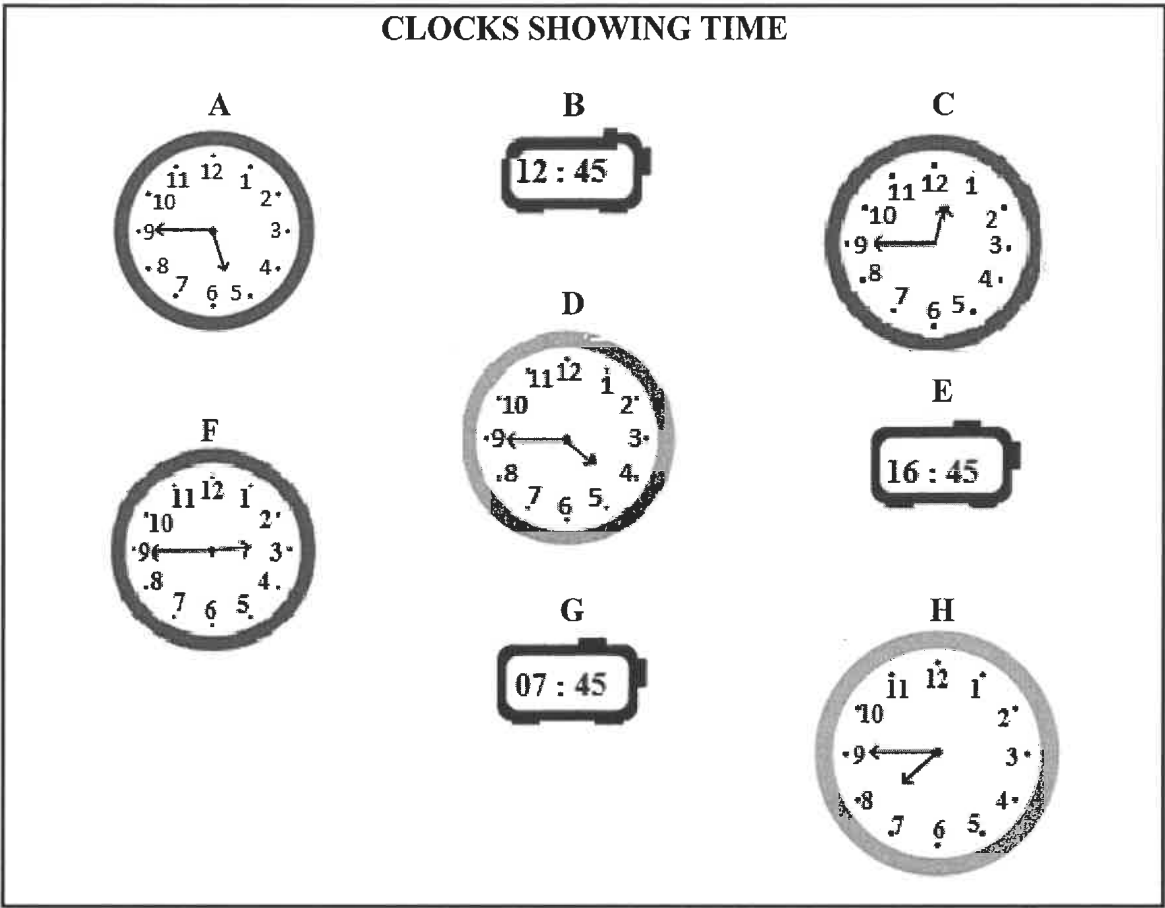
INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

ANNEXURE A for QUESTION 2.1
ANNEXURE B for QUESTION 2.2
ANNEXURE C for QUESTION 4.1
ANNEXURE D for QUESTION 4.3
ANNEXURE E for QUESTION 5.1
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 drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 Various clocks indicating time are shown below.

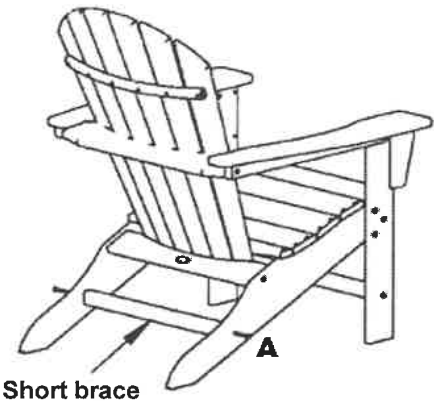


Use the information above to answer the questions that follow.

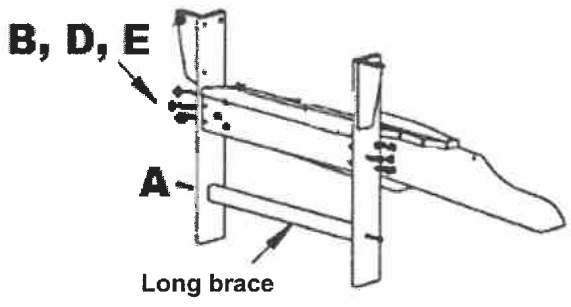
- 1.1.1 Which ONE of the following (X, Y or Z) best describes the time displayed on EACH clock?
- X Nine minutes to the next hour
- Y Forty-five minutes to the next hour
- Z A quarter to the next hour (2)
- 1.1.2 Name the TWO time formats used to display time on the clocks. (3)
- 1.1.3 Write down, in words, the time displayed on clock B. (2)
- 1.1.4 Write down the number of clocks that clearly indicates a time in the afternoon. (2)
- 1.1.5 Convert 16 hours and 45 minutes to minutes. (2)

1.2 Illustrated below are steps and some instructions to assemble a deck chair. To assemble the deck chair, the wooden pieces are joined together using fasteners (screws, bolts, washers and nuts). There are 32 pieces in the packet of fasteners. Each bolt is secured by a nut and a washer.

STEP 4
COMPLETED CHAIR



STEP 1



Long brace

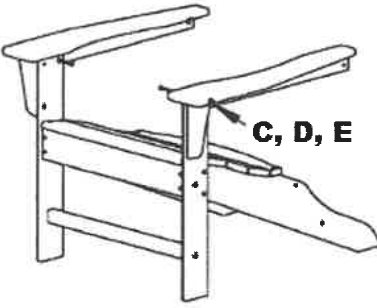
Attach the seat using bolts (B), nuts (E) and washers (D) to the two front legs.
Attach the long brace using the screws (A).

STEP 3



Attach the back to the seat and arms using the screws (A).

STEP 2



Attach the arms to the two front legs using the bolts (C), nuts (E) and washers (D).

TYPE OF FASTENER				
A Screw	B Bolt	C Bolt	D Washer	E Nut
				
Quantity	8	6	...	8

[Adapted from www.bin.com]

Use the information above to answer the questions that follow.

1.2.1 Determine the number of type C bolts used to assemble the deck chair. (2)

1.2.2 State the number of nuts left over after step 1 is completed. (2)

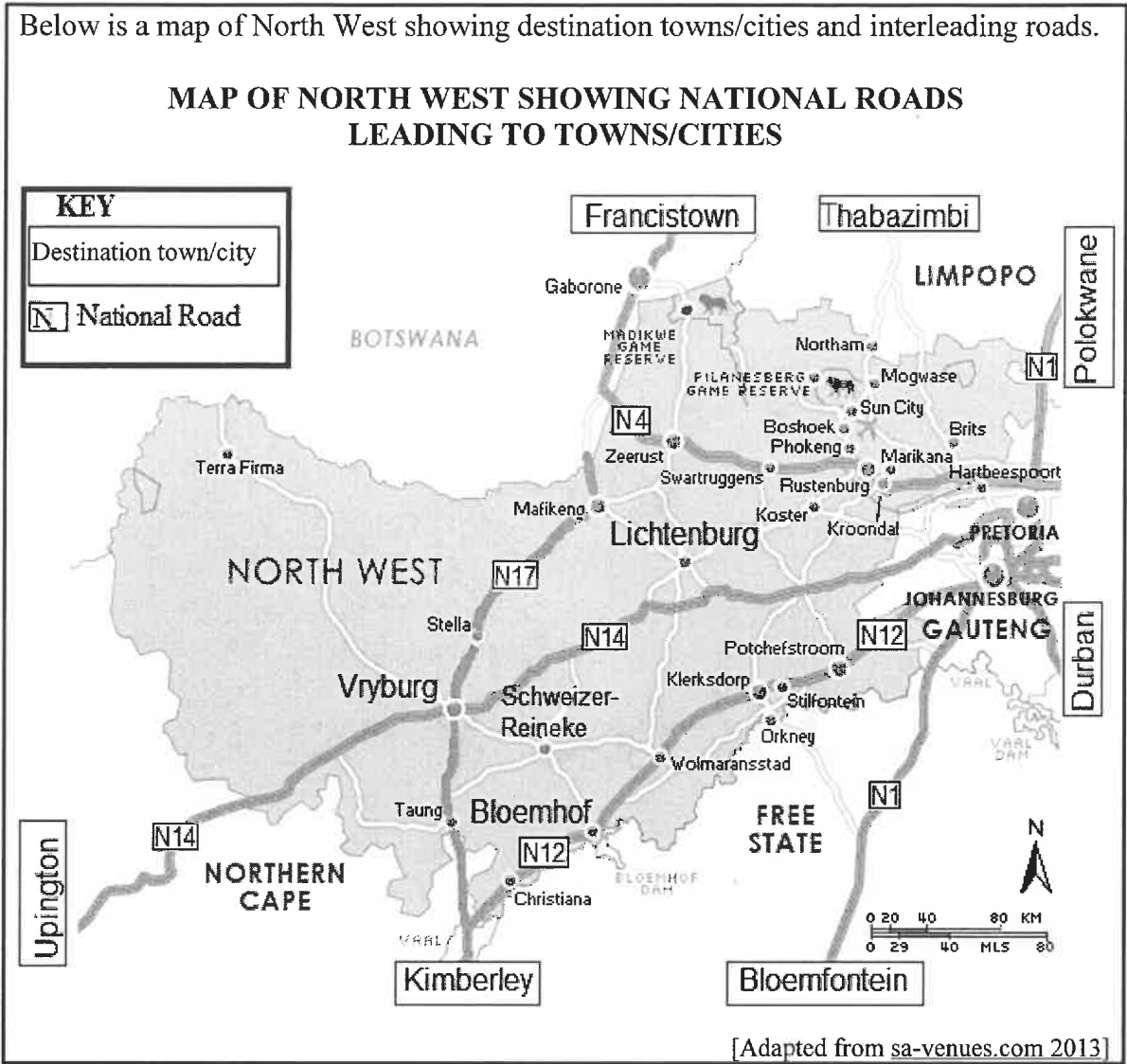
1.2.3 Name the last piece required to complete the assembly of the deck chair. (2)

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1.3 Below is a map of North West showing destination towns/cities and interleading roads.



Use the map above to answer the questions that follow.

- 1.3.1 Identify the type of scale used in the map. (2)
- 1.3.2 Name the province that lies east of North West. (2)
- 1.3.3 Identify the national roads passing through Vryburg. (2)
- 1.3.4 Write down the number of destination towns/cities shown on the map. (2)
- 1.3.5 Measure, in mm, the direct distance (as the crow flies) from Bloemhof to Lichtenburg. (2)
- [27]

QUESTION 2

2.1 ANNEXURE A shows a restaurant's seating plan for customers.

Use the information on ANNEXURE A to answer the questions that follow.

2.1.1 Give ONE possible reason why this restaurant has so many windows. (2)

2.1.2 Calculate the maximum number of chairs available for customers. (3)

2.1.3 Determine the number of seats directly facing the wall on the south side. (2)

2.1.4 Give ONE reason why the restaurant has couches at the entrance. (2)

2.1.5 A person at table 18 leaves her seat and walks towards her friend at table 4. She uses the arrow path shown on the seating plan.

Use compass directions to describe her path from table 18 to table 4. (3)

2.1.6 Norma claims that there are less than 21 tables for customers in this restaurant.

State, with a reason, whether her claim is valid. (3)

2.2 ANNEXURE B shows the choices on the set menu for a function at the restaurant.

Customers can choose:

- One protein: chicken (C), beef (B) or fish (F)
- One side order: vegetables (V) or a salad (S)
- One dessert: ice cream (I) or malva pudding(M)

Use the information on ANNEXURE B to answer the questions that follow.

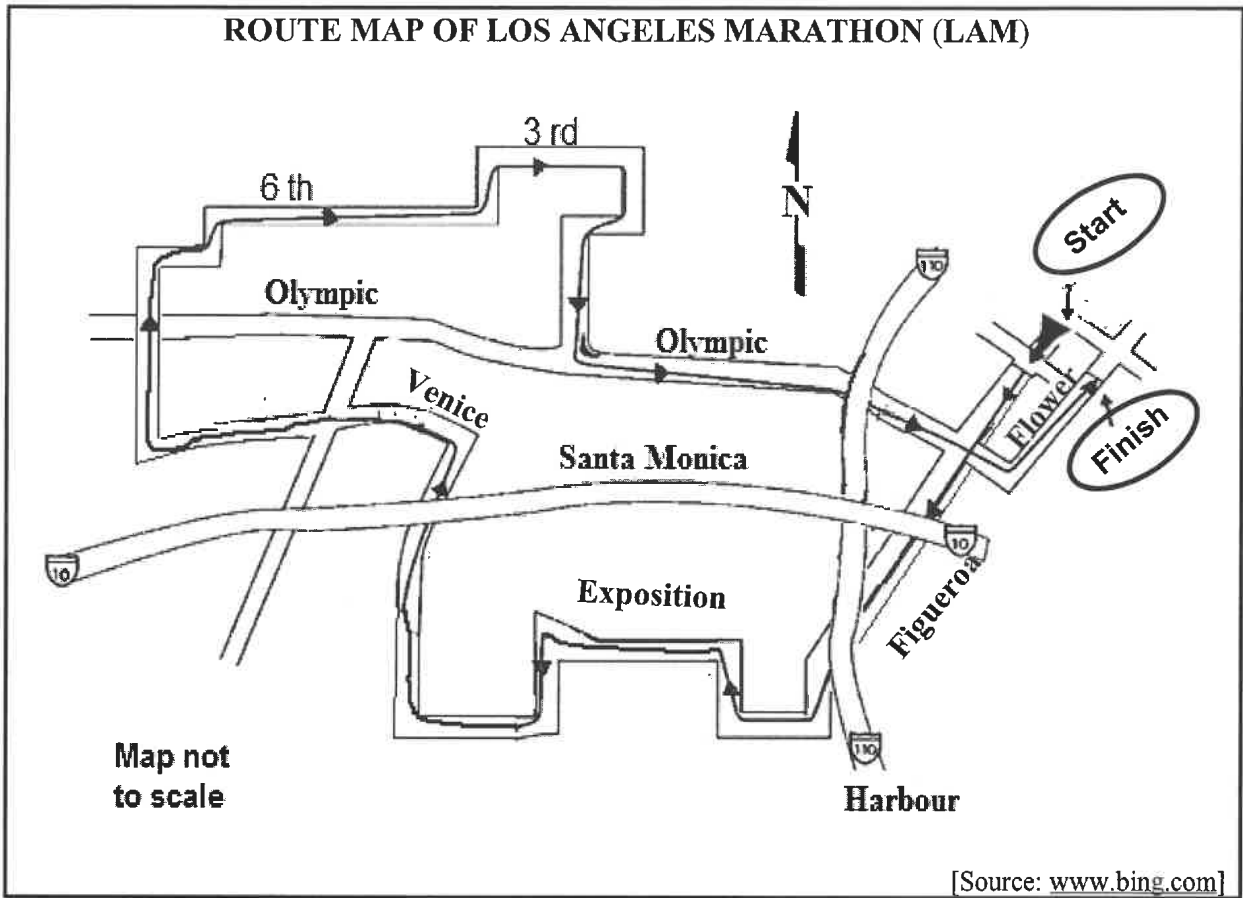
2.2.1 Name the type of diagram illustrated on ANNEXURE B. (2)

2.2.2 Write down the missing outcome at 2.2.2(a) and the protein choice at 2.2.2(b). (4)

2.2.3 State the number of combinations with beef as the protein. (2)

2.2.4 Determine, as a percentage, the probability of randomly selecting a meal with malva pudding as the dessert. (3)

2.3 Below is a simplified route map of the Los Angeles Marathon (LAM) in the United States of America. The LAM route is 26,2 miles.



Use the information above to answer the questions that follow.

- 2.3.1

Explain the meaning of *route map*.

(2)
- 2.3.2

Describe what is meant by 'Map not to scale'.

(2)
- 2.3.3

The runners in the Los Angeles Marathon have to pass underneath a bridge at certain points during the marathon.

(a)

Explain how this is indicated on the route map.

(2)

(b)

Write down the number of times that a runner who completes the marathon will pass underneath a bridge.

(2)
- 2.3.4

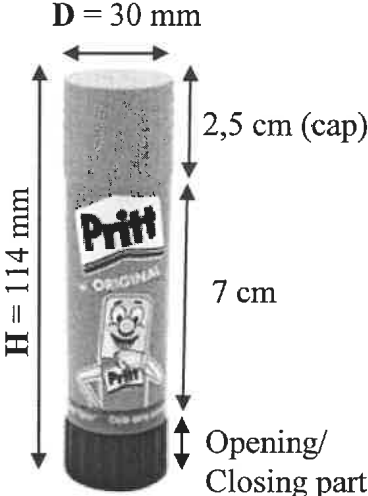
Write down the general direction in which the runners will face when they start in Flower Street.

(2)
- [36]

QUESTION 3

3.1 Every learner in a Technology class is expected to have Prestik and Pritt (glue stick). The Prestik is packed in a rectangular-shaped sleeve and the Pritt in a cylindrical container.

The dimensions of the rectangular face of the Prestik sleeve and the cylindrical Pritt container are given below.

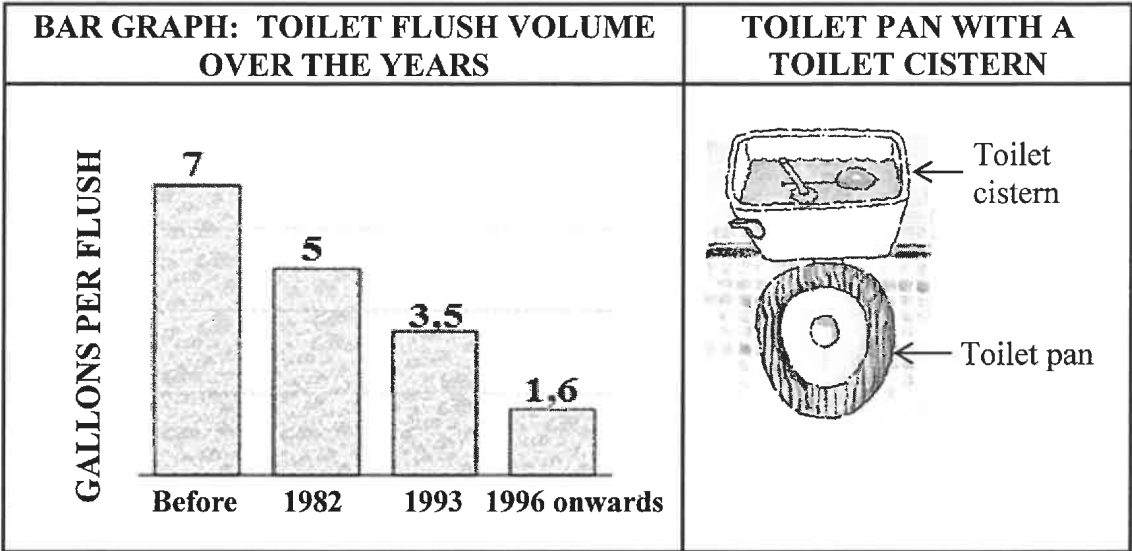
FRONT DIMENSIONS OF THE PRESTIK SLEEVE	DIMENSIONS OF A CYLINDRICAL PRITT CONTAINER
 Where L = length and W = width	 Where D = diameter and H = height

[Source: plastilon.co.za and mcsofficesupplies.co.za]

Use the information above to answer the questions that follow.

- 3.1.1 Calculate the perimeter of the front of the Prestik sleeve.
You may use the formula: **Perimeter = 2 × (length + width)** (3)
- 3.1.2 Calculate, in cm, the height of the opening/closing part of the Pritt container. (3)
- 3.1.3 The actual height of the glue in the Pritt container is 8,5 cm and the volume of the glue, rounded to THREE decimal places, is 52,346 cm³.
(a) Show how the volume of the glue was calculated if the diameter of the glue is 28 mm.
You may use the formula: **Volume = 3,142 × radius² × height** (4)
(b) Determine (rounded to the nearest gram) the mass of the glue in the Pritt container, if the density of the glue is 0,82 g/cm³.
You may use the formula: **Density = Mass ÷ Volume** (4)

3.2 Water is a scarce resource in South Africa. The graph below shows how the volume of water in a toilet cistern has been reduced over the years. The picture next to the graph shows a toilet pan with a toilet cistern.



NOTE: 1 gallon = 3,785 litres

Use the information above to answer the questions that follow.

- 3.2.1

Calculate (in litres) the volume of water used during February 2022 by a family of five, if each person flushed the toilet an average FOUR times a day during the month.

(3)
- 3.2.2

State ONE way in which a person can save water in this context.

(2)

3.3 Ouma intends baking two milk tarts for her friends who will be arriving at 17:30. She uses the ingredients and information below. She can only bake one milk tart at a time. While the first milk tart is in the oven, she prepares the second milk tart in order to put it in the oven the moment the first one is taken out.

INGREDIENTS AND INFORMATION FOR ONE MILK TART

Preparation time 30 minutes	Cooking time 40 minutes	Temperature 325 °F
---------------------------------------	-----------------------------------	------------------------------

Serves 8 people

3 tablespoons butter, melted
1 cup white sugar
3 egg yolks
1 cup cake flour
 $\frac{1}{4}$ teaspoon salt
1 teaspoon vanilla extract
 $4\frac{1}{4}$ cups of milk

[Adapted from allrecipes.com]

NOTE: 1 cup = 250 ml

Use the information above to answer the questions that follow.

3.3.1 Ouma would like the second milk tart to be taken out of the oven 15 minutes before her friends arrive.

Determine the time Ouma must place the first milk tart in the oven. (3)

3.3.2 Convert the baking temperature to degrees Celsius (°C), rounded to the nearest 10 degrees.

You may use the following formula: $^{\circ}\text{C} = (^{\circ}\text{F} - 32^{\circ}) \times \frac{5}{9}$ (3)

3.3.3 Determine how many litres of milk Ouma needs to bake the two milk tarts. (4)

[29]

QUESTION 4

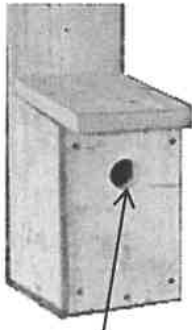
4.1

Itumeleng makes and sells birdhouses at a local flea market.

ANNEXURE C shows the diagram of the parts of the birdhouse and the assembly instructions.

He uses a single board that is 14 cm wide and 20 mm thick to make one birdhouse.

Picture of a completed birdhouse



Front exposed (part with hole)

Use the information above and ANNEXURE C to answer the questions that follow.

4.1.1

Show (rounded to the nearest hundred) that the length of the board needed for a single birdhouse is 1 500 mm.

(3)

4.1.2

Itumeleng stated that in Step 2, the 10 cm side of the floor will go against the back.

Verify, showing all calculations, whether his statement is CORRECT.

(4)

4.1.3

The front part of the birdhouse has a circular hole with a diameter of 4,2 cm drilled into it.

Calculate (in cm²) the exposed surface area of the front part of the birdhouse.

You may use the following formulae:

Area of a rectangle = length × width

Area of a circle = 3,142 × (radius)²

(6)

4.2

Itumeleng paints the exposed exterior surface area of the birdhouse.

The total surface area of the birdhouse that will be painted is 0,2888 m².

He applies three coats of paint according to the spread rate instructions on the paint tin, as follows:

- First coat: 10 m²/litre
- Subsequent coats: 14 m²/litre

Itumeleng stated that he will be able to paint seven birdhouses with 500 mℓ of paint.

Verify, showing ALL calculations, whether his statement is CORRECT.

(8)

4.3

Itumeleng has the following expenses for his birdhouse business:

- Rental of the stall at the flea market, R250 per week
- Transport, R100 per week
- Wooden boards, R287,40 for a bundle of six boards
- Paint, R21,40 per birdhouse
- Sundries, R10,70 per birdhouse

ANNEXURE D shows the graph representing Itumeleng's weekly income and expenses for his birdhouse business.

Use ANNEXURE D and the information above to answer the questions that follow.

4.3.1 The equation to calculate his weekly expenses can be written as follows:

Expenses = R350 + p × number of birdhouses made,
where p = variable cost for each birdhouse made

(a) Show how the value of R350 (his fixed weekly cost) was calculated. (2)

(b) Calculate the value of p , the variable cost of making one birdhouse. (3)

4.3.2 Explain *break-even point* in this context. (2)

4.3.3 During one of the weeks, Itumeleng made 15 birdhouses, but only sold 12.

Show, by means of calculations, if he made a profit or a loss for that week. (4)
[32]

QUESTION 5

Danny and Susan are on their way to visit some of the tourist locations in Japan.

ANNEXURE E shows a road infographic of their planned tour with the various tourist locations that would be visited.

Use the information above and ANNEXURE E to answer the questions that follow.

- 5.1 The tourist location details (in random order) for the tour are given below.
- (a) Start in Tokyo
 - (b) Visit Mount Fuji
 - (c) Visit the world's largest aquarium to see the different types of fish in Osaka
 - (d) At Nara they plan to visit the large wooden temple and the deer park.
 - (e) The trip will end at Itsukushima which is known for the Great Torii Gate that is standing in water at high tide.
 - (f) Drive though Kamakura at a speed not exceeding 40 km/h

Complete the table below by inserting the tourist location details in the correct order.

NOTE: Location details for 01 and 06 have been given in the table.

Location	Tourist location details
01	a
02	...
03	...
04	...
05	...
06	e

(4)

- 5.2 Mount Fuji is an active volcano. The last volcanic eruption was on 16 December 1707 and it followed several weeks after an earthquake on 11 November 1707.

- 5.2.1 Calculate how many decades ago Mount Fuji erupted. (3)
- 5.2.2 Write down the total number of days between the earthquake and the last volcanic eruption. (3)

5.3 In Tokyo they will visit the Tokyo tower which is a communication and observation tower. The tower is 1 092,1916 feet tall and has two viewing decks. The main deck is 150 m above the ground and the top deck is 250 m above the ground.

Some of the ticket prices per person are as follows:

TOKYO TOWER VIEWING DECKS		
	MAIN DECK	TOP DECK
Adult (19 years and older)	1 200 yen	3 000 yen
High school (16 to 18 years old)	1 000 yen	2 800 yen
Group reservation for main deck (group of 20 people or more, but less than 50)		
Adult	1 080 yen	
High school	900 yen	
Group reservation for main deck (group of 50 people or more)		
Adult	960 yen	
High school	800 yen	

Use the information above to answer the questions that follow.

- 5.3.1 Write, in simplified form, the ratio of the height above the ground of the main deck to the top deck. (2)
- 5.3.2 Convert, in metres, the height of the tower if 1 m = 3,281 feet. (2)
- 5.3.3 Danny stated that if they had been in a group of 60 people observing from the main deck, they could have received 30% discount on an adult ticket.

Verify whether his statement is CORRECT showing ALL calculations. (6)

5.4 On their return journey Danny and Susan took a train from Hiroshima to Tokyo.

- The train left Hiroshima station at 08:06.
- It stopped at eight stations en route for 4 minutes at a time.
- It reached Tokyo at 12:03.
- The distance the train travelled is 816 km.

Calculate the average speed at which this train travelled.

You may use the formula: **Distance = speed × time** (6)
[26]

TOTAL: 150



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SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

2022

MARKS: 150

TIME: 3 hours

This question paper consists of 13 pages and an addendum with 4 annexures.

INSTRUCTIONS AND INFORMATION

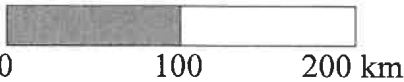
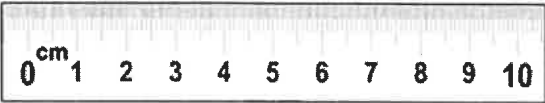
1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:
 - ANNEXURE A for QUESTION 2.1
 - ANNEXURE B for QUESTION 2.2
 - ANNEXURE C for QUESTION 4.1
 - ANNEXURE D for QUESTION 5.2
3. Number the answers correctly 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.

QUESTION 1

- 1.1
- Sifiso is a builder who uses building plans and measuring instruments.

Some measuring instruments and scales used by builders are shown below.

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–G) next to the question numbers (1.1.1 to 1.1.5) in the ANSWER BOOK.

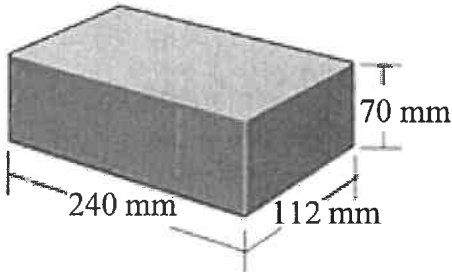
COLUMN A	COLUMN B
1.1.1 The most appropriate scale to draw a map of South Africa	A 
1.1.2 The instrument most suited to measure the circumference of a dinner plate	B 
1.1.3 The most appropriate scale to draw a plan of a house	C 
1.1.4 The instrument most suited to measure the width of a soccer field	D 1 : 50 000
1.1.5 The instrument most suited to measure the length of a pencil	E 
	F 
	G 1 cm = 1 m

(5 × 2)

(10)

1.2

The sketch below shows a standard brick, with dimensions, used in South Africa.

SKETCH OF A STANDARD BRICK	DIMENSIONS OF THE BRICK
	Height = 70 mm Width = 112 mm Length = 240 mm

Use the information above to answer the questions that follow.

1.2.1 State which formula (**A**, **B** or **C**) below can be used to calculate the total surface area (TSA) of the given brick.

A $TSA_{\text{(brick)}} = \text{Area of front side} + \text{Area of right-hand side} + \text{Area of top}$

B $TSA_{\text{(brick)}} = (2 \times 240 \times 70 + 2 \times 240 \times 112 + 2 \times 112 \times 70) \text{ mm}^2$

C $TSA_{\text{(brick)}} = (240 \times 70 + 240 \times 112 + 112 \times 70) \text{ mm}^2$ (2)

1.2.2 State the unit of measurement for the volume of this brick. (2)

1.2.3 Convert the length of this brick to metres. (2)

1.2.4 Determine the maximum number of rows of bricks that can be stacked height-wise to a height of 2 100 mm. (3)

1.3 Maria uses the recipe below to bake scones.

Ingredients (makes 1 dozen)	Picture of the scones
75 g butter 2 large eggs 75 g sugar 4 teaspoons baking powder 230 ml milk 500 g flour 1 cup raisins	
Baking Instruction	
Bake for 15 minutes at 200 °C.	

Use the information above to answer the questions that follow.

- 1.3.1 Convert the mass of the flour to kilograms. (2)
- 1.3.2 Determine the number of large eggs needed to make **30** scones. (2)
- 1.3.3 Each scone has an average diameter of 7 cm.
Write down the average radius of EACH scone. (2)
- 1.3.4 Calculate how many full dozen scones can be made with 500 g of butter. (3)
- 1.3.5 The scones were placed in the oven to bake at 14:10.
Write down, in words, the time the scones were placed in the oven. (2)
- [30]

QUESTION 2

- 2.1 Busisiwe participated in a Vhi Women's Mini Marathon. ANNEXURE A shows the route for the mini-marathon.

Use ANNEXURE A and the information above to answer the questions that follow.

- 2.1.1 Write down the starting time of the mini-marathon using the 24-hour format. (2)
- 2.1.2 Determine the number of places where an ambulance can be found. (2)
- 2.1.3 State which mode of transport is NOT allowed on the mini-marathon route. (2)
- 2.1.4 The distance of a standard marathon is 42,2 km.
- (a) Determine, in simplified form, what fraction of a standard marathon the Vhi Women's Mini Marathon is. (4)
- (b) Give ONE reason why the Vhi Women's Mini Marathon is called a mini-marathon. (2)
- 2.1.5 Choose the answer and write only the letter (A–C) next to the question number (2.1.5).
- The probability of a runner crossing the railway line during the mini-marathon is ...
- A definite.
- B 0%.
- C 100%. (2)

2.2

Busisiwe lives in Irene.

ANNEXURE B shows the layout plan of Irene. Some streets end in a cul-de-sac¹. The arrows on some streets show the traffic flow in one direction only (one-way streets).

NOTE:

¹Cul-de-sac – a street ending in a dead end, that is, having only one entry/exit

Use ANNEXURE B and the information above to answer the questions that follow.

- 2.2.1 Write down the place of interest that is situated at the corner of Krige Street and Bruce Street. (2)
- 2.2.2 Give the general direction from Bastion Guest House to the Station & Shopping Centre. (2)
- 2.2.3 Name the street that the railway lines cross. (2)
- 2.2.4 Give the name of the church found in King Street. (2)
- 2.2.5 Busisiwe gives David the following travelling instructions to meet her:
- Drive from Irene Pre-Primary east along Crawford Street.
 - Turn left into Queen Street.
 - Take the first right into Stanley Street and continue to King Street.
 - Turn right into King Street, pass five streets and then turn left.
 - Continue across the first street. Before the next intersection Busisiwe will be waiting for David.
- Identify the place where Busisiwe will be waiting for David. (3)
- 2.2.6 The actual straight-line distance (as the crow flies) from the entrance of Irene Pre-Primary to the entrance of Irene Primary School is 1,9 km.
- Determine, rounded to the nearest thousand, the scale of the layout plan in the form 1 : ... (5)
- 2.2.7 Explain why a driver travelling along King Street cannot turn right into Bruce Street. (2)

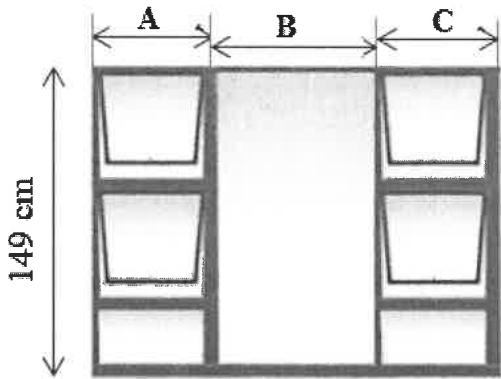
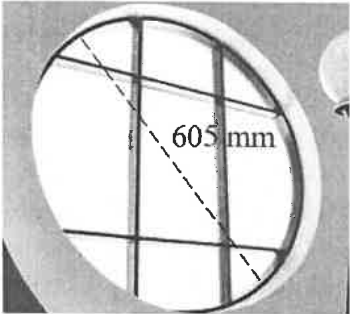
[32]

QUESTION 3

3.1 Tshego is renovating her home. She is removing the wooden-framed windows and is replacing them with aluminium-framed windows.

The dimensions and the shape of two of the window frames are given below.

In the rectangular window frame, four windows can open. It has three sections: A, B and C. The circular window frame has no windows that can open.

RECTANGULAR WINDOW FRAME	CIRCULAR WINDOW FRAME
 Outer dimensions of the window frame: Length A = 55 cm, B = 99 cm and C = 55 cm. Width = 149 cm	 Inner diameter = 605 mm

[Source: www.premiumaluminium.co.za]

The following formulae may be used:

- Area of a rectangle = length × width
- Area of a circle = 3,142 × (radius)²
- Perimeter of a rectangle = 2(length + width)
- Circumference of a circle = 3,142 × diameter

Use the information above to answer the questions that follow.

- 3.1.1

Determine the perimeter of the rectangular window frame.

(3)
- 3.1.2

Calculate the inner area in cm² of the circular window frame.

(4)
- 3.1.3

One of the windowpanes of the rectangular window frame broke.
- Write the probability, as a decimal, that it is NOT one of the windowpanes that can open.

(3)

3.2

Tshego also intends tiling the dining room and lounge floors.

The dimensions of the lounge floor are 4 m by 5 m and of the dining room floor 3 m by 4 m.

Information and cost:

- Tshego intends using tiles that are 35 cm by 35 cm.
- One box of 4 tiles costs R143,84.
- Tile cement costs R99,90 per 20 kg bag, which covers 3 m².
- She needs 4 bags of tile grout at R89,90 per 5 kg bag.
- The cost of labour is R2 500.
- Tshego's total budget for the tiling project is R15 000.

Use the information above to answer the questions that follow.

3.2.1 Show that the total floor area to be tiled is 32 m².

You may use this formula:

Area of a rectangle = length × width (2)

3.2.2 Determine how many boxes of tiles Tshego will need if an extra 10% of the number of tiles must be added for cutting and breakages. (9)

3.2.3 Show by means of calculations if Tshego's budget is enough to finish the tiling project. (8)
[29]

QUESTION 4

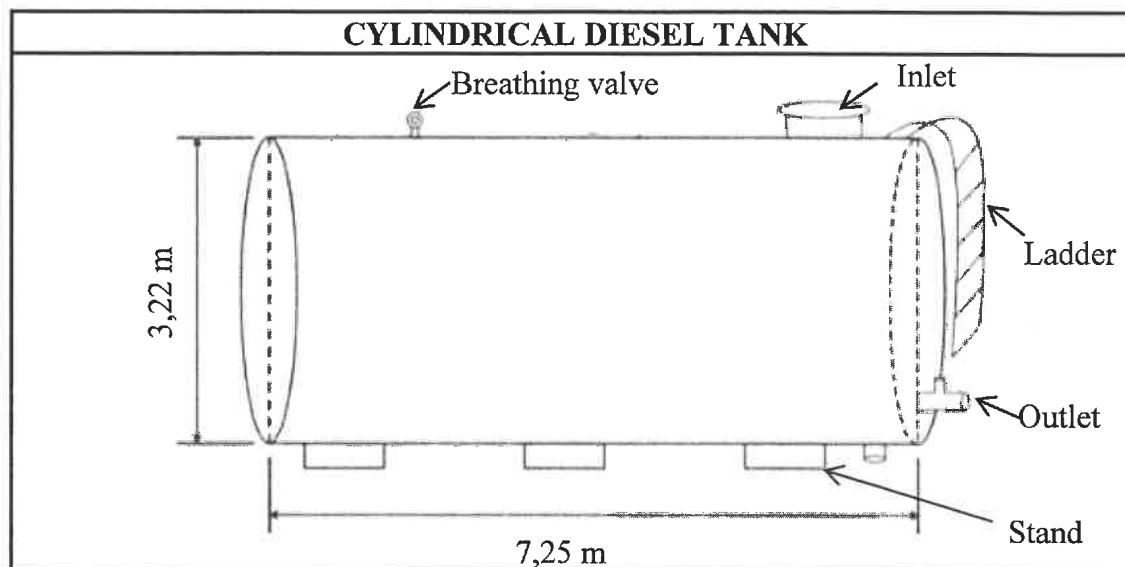
- 4.1 ANNEXURE C shows the seating plan for a cinema during the Covid-19 pandemic. Seats marked with an 'X' need to be left vacant in order to comply with social distancing regulations.

Use ANNEXURE C and the information above to answer the questions that follow.

- 4.1.1 On which side of the cinema is seat E4 from seat E15 when a person is facing the screen? (2)
- 4.1.2 Assume that pre-Covid-19 conditions apply and all the seats are occupied.
- (a) Name the row and seat number of the middle seat in the 8th row from the screen. (2)
- (b) Write down the ratio of the number of wheelchair spaces to the number of seats for patrons NOT in wheelchairs. (3)
- 4.1.3 On Friday evenings, pre-Covid-19, all the seats in the cinema (excluding the wheelchair spaces) were always occupied.
- Calculate the percentage income lost due to social distancing during the pandemic if ALL the tickets for the seats are equally priced. (3)

4.2

The cinema owners use a generator to continue showing movies during load shedding. The diesel for the generator is stored in a cylindrical diesel tank, as shown below.



[Source: abovegroundstorage tanks.com]

INFORMATION:

- The stand and all external attachments are made of stainless steel and will not be painted.
- The base area of these external attachments is 1 m^2 .
- $1 \text{ m}^3 = 1\,000 \text{ l}$
- All dimensions shown are outer measurements.

Use the information above to answer the questions that follow.

4.2.1 State the purpose of the breathing valve on the tank. (2)

4.2.2 The steel used to make the tank is 5 mm thick all around. For safety reasons, the tank is filled to 95% of its capacity.

(a) Show that the inner diameter of the tank is 3,21 m. (2)

(b) Calculate the maximum litres of diesel that this tank can hold according to safety regulations.

You may use this formula:

$$\text{Volume of a cylinder} = 3,142 \times (\text{radius})^2 \times \text{height} \quad (8)$$

4.2.3 The external surface area of the tank, excluding the base area of the external attachments, needs to be painted. The spread rate of the paint is $3 \text{ m}^2/\text{l}$. The manager states that he would need less than 30 litres of paint to complete the task.

Verify, by showing ALL calculations, whether the manager is CORRECT.

You may use this formula:

$$\text{Surface area of a cylinder (in } \text{m}^2) = 2 \times 3,142 \times r (r + h),$$

where r = radius and h = height.

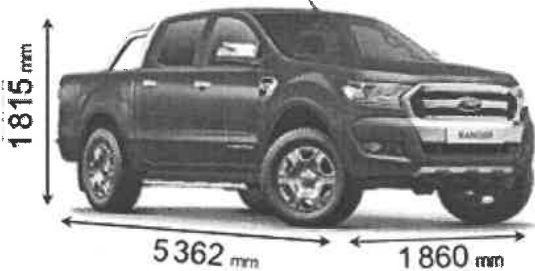
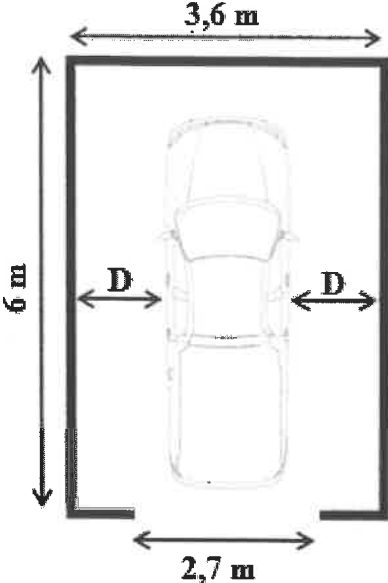
(8)
[30]

QUESTION 5

5.1

Letitia buys a new bakkie with a portion of her retirement funds.

Dimensions of her bakkie and her existing garage are shown below.

DIMENSIONS OF HER BAKKIE	INNER DIMENSIONS OF HER GARAGE
 [Source: www.automobiledimensions.com] Width = 1 860 mm Length = 5 362 mm Height = 1 815 mm	 [Source: www.bing.com]

Use the information above to answer the questions that follow.

- 5.1.1

Identify which view of the bakkie is represented by the dimensions 1 815 mm × 1 860 mm.

(2)
- 5.1.2

Calculate the value of **D** (the space between the sides of the bakkie and the side walls of the garage) if the bakkie is parked exactly in the middle of the garage.

(4)
- 5.1.3

Letitia needs to choose a colour and window tint.

The bakkie comes in four colours: white, black, blue and green.
The windows can be tinted using 35% tint or 50% tint.

State how many different choices there are for this bakkie.

(2)

5.2

Letitia studied a strip chart connecting Springbok in South Africa with Windhoek in Namibia.

On ANNEXURE D is a strip chart showing road distances in kilometres from Springbok to Windhoek.

Use ANNEXURE D to answer the questions that follow.

5.2.1 State ONE difference between a *strip chart* and a *normal road map*. (2)

5.2.2 Determine the distance between Springbok and Gobabis. (3)

5.2.3 Identify the Namibian town found on the border between South Africa and Namibia. (2)

5.2.4 Letitia undertook the following trip:

- She left Solitaire at 04:00 and travelled 140 km south on C14.
- She then turned right and travelled 289 km east on C19.
- At Mariental she turned, then drove to Keetmanshoop and arrived at 12:25.

(a) Calculate the total distance Letitia travelled during this trip. (3)

(b) Letitia travelled on different types of roads and she maintained the average speed limit prescribed for these types of roads. She stopped three times during the trip to take a break.

Letitia stated that the three breaks were approximately 25 minutes each.

Verify, with calculations, whether Letitia's statement is CORRECT.

You may use this formula: $\text{Time} = \frac{\text{Distance}}{\text{Speed}}$ (11)
[29]

TOTAL: 150



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SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

2023

MARKS: 150

TIME: 3 hours

This question paper consists of 13 pages and an addendum with 3 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

ANNEXURE A for QUESTION 1.2
ANNEXURE B for QUESTION 2.1
ANNEXURE C for QUESTION 5
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 drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 In TABLE 1 below is a list of explanations and definitions of concepts used in Mathematical Literacy.

TABLE 1: EXPLANATIONS AND DEFINITIONS OF CONCEPTS	
A	The distance from the centre of a circle to the outer part of the circle
B	The use of cardinal directions (i.e. north, south, east and west) to describe the location of one point to the other
C	The path or boundary that surrounds a circular-shaped object or surface
D	A position which is not exact, but roughly shows the location of an object
E	A measure of body fat based on the height and weight of an adult person
F	The total area of all the faces of a 3D-shaped object
G	A special type of diagram used to determine the outcomes of an event in probability examples
H	The arrangement of something laid out, such as the structural features of a mall
I	The ratio of the distance in real life compared to the same distance on a map
J	The rate of covering a certain distance over time

Use the information above to write down the letter of the explanation or definition (A to J) of EACH of the following concepts:

- 1.1.1 BMI (body mass index) (2)
- 1.1.2 Circumference (2)
- 1.1.3 Map scale (2)
- 1.1.4 Compass direction (2)
- 1.1.5 Tree diagram (2)

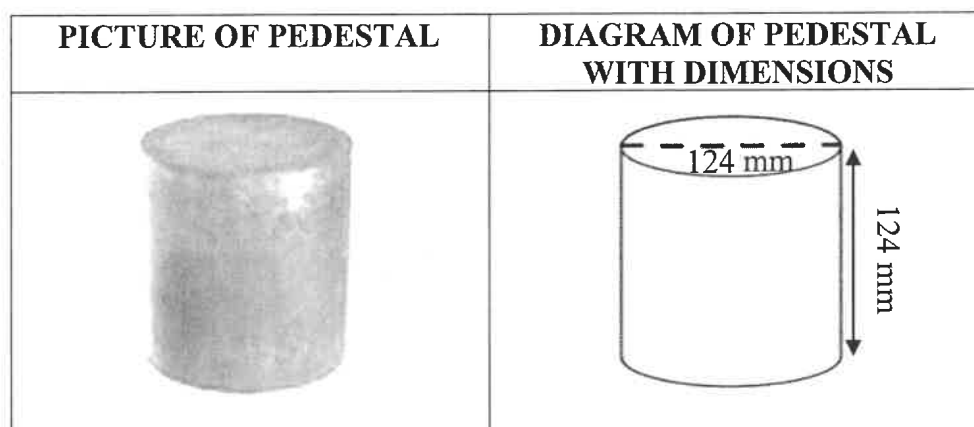
1.2 ANNEXURE A shows the layout of a vegetable garden with different plant beds, as well as TABLE 2 which shows plants with their partner plants.

Use ANNEXURE A to answer the questions that follow.

- 1.2.1 Identify THREE plants that have cabbage as a partner. (3)
- 1.2.2 Determine the number of partners of the plant found in bed 4 of the vegetable garden. (2)
- 1.2.3 Name the partner plant which appears four times in the partner column. (2)
- 1.2.4 Give the compass direction of sage from the onions in the vegetable garden. (2)
- 1.2.5 Some of the plant beds in the vegetable garden contain more than one type of plant. Write down the plant bed numbers of these plant beds. (3)

1.3

The sketches below show a pedestal and a diagram of the pedestal with its dimensions. The pedestal can be used as a table, plant stand or as extra seating.



[Source: ladiff.com/project/unaconcrete-pedestals]

Use the information above to answer the questions that follow.

- 1.3.1 Choose a formula (**A**, **B** or **C**) below which can be used to calculate the total volume of the pedestal.

NOTE: In EACH formula, **r** = **radius** and **h** = **height**.

A Volume = $(2 \times \pi \times r \times h) + (2 \times \pi \times r^2)$

B Volume = $(2 \times \pi \times r^2) \times h$

C Volume = $\pi \times r^2 \times h$ (2)

- 1.3.2 Write down the unit of measurement for the volume of the pedestal using the given unit in the diagram. (2)

- 1.3.3 Convert the height of the pedestal to metres. (2)

[28]

QUESTION 2

2.1

Ring lights are the best lighting option for close-up photography and videography. Ring lights are used for projects like make-up sessions.

ANNEXURE B shows the item list and assembly instructions for a ring light. Some of the instructions have been omitted.

Use ANNEXURE B to answer the questions that follow.

- 2.1.1 Determine the total number of items needed to assemble the ring light. (2)
- 2.1.2 Identify, in the list, the item that will be used as the ring light stand. (2)
- 2.1.3 Is the direction of the arrow in diagram B clockwise or anticlockwise? (2)
- 2.1.4 Match the following instructions with the correct picture (F, G or H):
- (a) Clamp the cellphone to the cellphone holder. (2)
- (b) Install the tripod on the pan-tilt and rotate until tightened. (2)

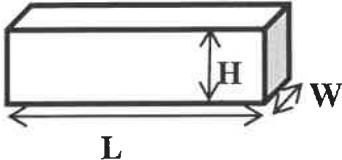
2.2

The scale used on a wall map in a classroom is 1 : 250 000.

- 2.2.1 Use the given scale to determine the distance on the wall map if the real distance is 65 kilometres. (3)
- 2.2.2 Name ONE other type of scale used on maps. (2)

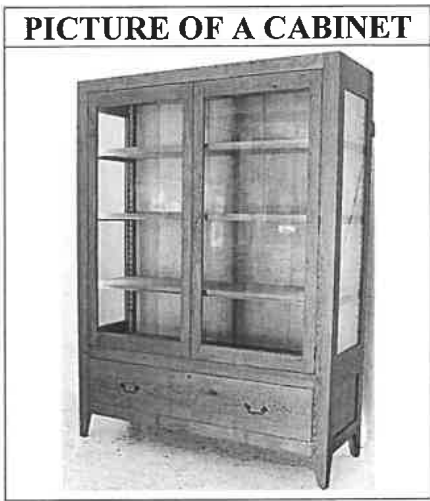
2.3 A Mathematical Literacy teacher collected 36 reams of paper from her learners.

Shown below is a picture and a diagram, with the dimensions, of a ream of paper.

PICTURE OF A REAM OF PAPER	DIAGRAM OF A REAM OF PAPER WITH DIMENSIONS
	 Length (L) = 27,94 cm Width (W) = 21,59 cm Height (H) = 6,35 cm

The teacher intends packing the reams of paper in a secure cabinet, as shown in the picture alongside.

The dimensions of the maximum space on one shelf are 102 cm long, 44 cm wide and 39 cm high.



Use the information above to answer the questions that follow.

- 2.3.1

Show, with calculations, that all the reams of paper collected can fit on ONE shelf of the cabinet.

(7)
- 2.3.2

Give ONE reason why the teacher would like to pack the reams of paper in the cabinet.

(2)
- [24]

QUESTION 3

3.1 Unathi bought a house. Two of the walls in one of the bedrooms were not plastered. The dimensions of the floor of this bedroom are 4,8 m × 3,5 m, as shown in the diagram below, with a wall height of 2,75 m. Unathi intends having the walls plastered.

NOTE: 'Plastered' means the walls are coated with a sand and cement mixture to create a smooth wall surface.

DIAGRAM SHOWING BEDROOM WITH DIMENSIONS	PICTURE OF TWO UNPLASTERED WALLS, THE CEILING AND OLD CORNICES

Use the information above to answer the questions that follow.

3.1.1 Calculate, in m², the total surface area of the two walls that need to be plastered.

You may use the following formula:

Area of a rectangle = length × width (4)

3.1.2 The plaster on the walls has a uniform thickness of 12 mm.

Determine, in cm³, the volume of plaster required to plaster these two walls.

You may use the following formula:

Volume of plaster = area of walls × thickness of plaster (5)

- 3.1.3 The ready-mix plaster is available in bags. One bag is needed for every $15\,000\text{ cm}^3$.

Determine the minimum number of bags needed to plaster the two walls. (3)

- 3.1.4 Unathi would also like to have all the old cornices in the bedroom, where the four walls meet the ceiling, replaced.

Calculate, in metres, the total length of the new cornices.

You may use the following formula: **Perimeter** = $2 \times (\text{length} + \text{width})$ (3)

- 3.2 Unathi is advised to choose a specific brand of ready-mix plaster to prevent dampness in the walls.

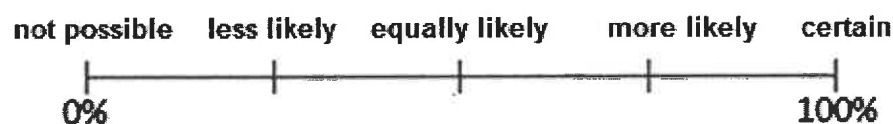
- 3.2.1 At the store, there are five available brands. Unfortunately, Unathi forgets the name of the specific brand.

If she randomly selects one of the available brands, determine the probability that she will select the specific brand. (2)

- 3.2.2 There is a 0,75 probability that the dampness will appear if the incorrect brand of ready-mix plaster is used.

Determine the probability that the dampness will NOT appear if the incorrect ready-mix plaster is used. (2)

- 3.2.3 The probability scale below shows the likelihoods for various probabilities.



Write down the likelihood that best describes your answer given to QUESTION 3.2.2. (2)

3.3

The instructions on the ready-mix plaster bag are as follows:

- Use 7 litres of water for a 40 kg bag of ready-mix plaster.
- Mix the water and plaster for 4 minutes to achieve a good consistency.
- Do not overmix.
- Allow the mixture to stand for 3 minutes for additives to dissolve.
- Mix again for about 2 minutes.
- Plaster is ready for use.



Use the above information to answer the questions that follow.

3.3.1 Determine the time that Unathi must start mixing the first bag of ready-mix plaster if she wants this bag to be ready for use at 08:05. (3)

3.3.2 Calculate (rounded to TWO decimal places) how many gallons of water she will use to mix five bags of plaster, if one gallon = 3,78541 ℓ. (3)

3.3.3 The plaster reaches its full strength 21 days after it has been applied, at an average room temperature of 73,4 °F.

Convert this temperature to °C.

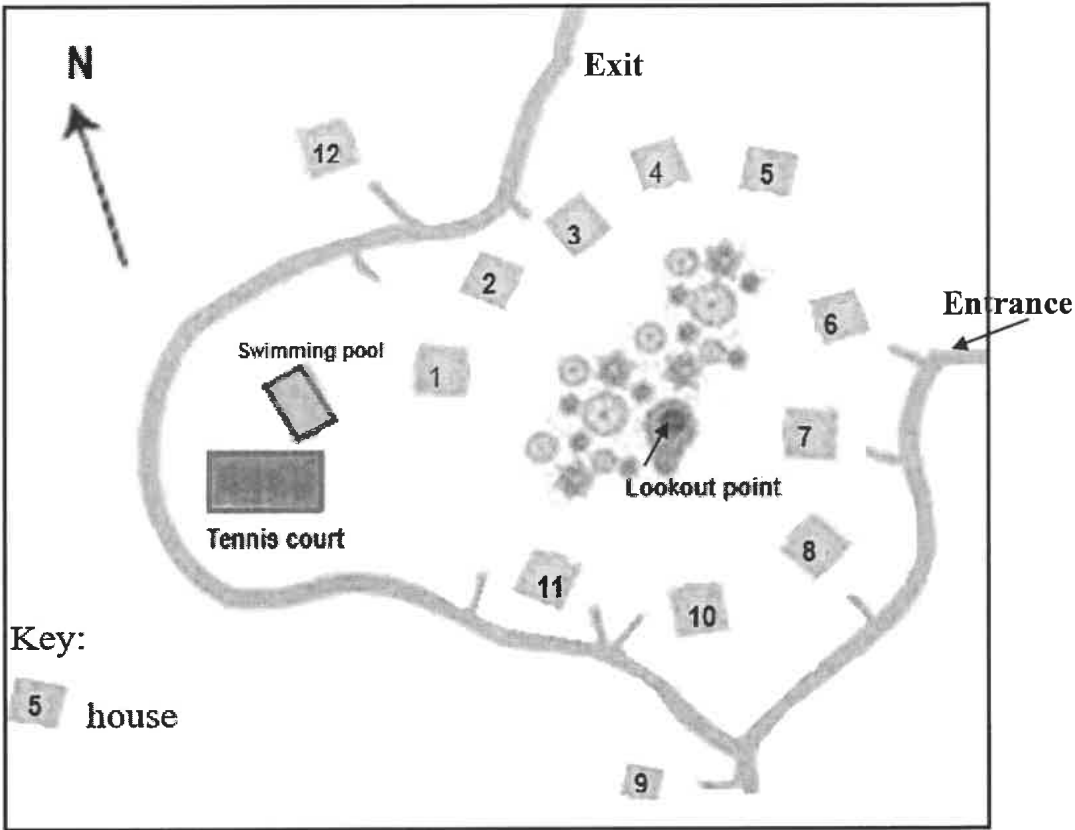
You may use the following formula: $^{\circ}\text{F} - 32^{\circ} = (1,8 \times ^{\circ}\text{C})$ (4)
[31]

QUESTION 4

4.1 The layout plan of a holiday resort is given below.

The resort has a rectangular swimming pool and a tennis court. There is an overgrown area in the middle of the resort where local wildlife can be viewed from a lookout point. This area is surrounded by houses.

LAYOUT PLAN OF A HOLIDAY RESORT

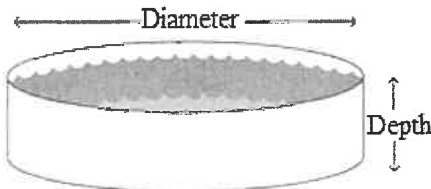
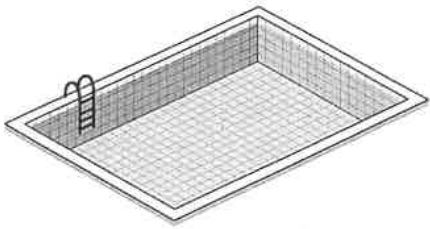


[Adapted from dikholoresort.co.za]

Use the information above to answer the questions that follow.

- 4.1.1 Determine the total number of houses in this holiday resort. (2)
- 4.1.2 A person standing at the lookout point, facing north, views houses that are in a north-westerly direction.
- Give the numbers of TWO of the houses he viewed. (3)

4.2

The owners of the holiday resort plan to build a cylindrical pool. The pictures below show the existing rectangular swimming pool and a cylindrical swimming pool which the owners plan to build at the holiday resort.	
CYLINDRICAL SWIMMING POOL	RECTANGULAR SWIMMING POOL
	
[Source: swimuniversity.com]	[Source: vexels.com]
Inner dimensions of the pool: Diameter = 7 m Depth = 1 m Tiles = 20 cm × 20 cm (16 in a box)	Inner dimensions of the pool: Length = 6,2 m Width = 3,25 m Depth = 1,65 m
NOTE: 1 m³ = 1 000 litres	

Use the information above to answer the questions that follow.

- 4.2.1 Give ONE reason why you think the cylindrical pool is designed for small children. (2)
- 4.2.2 Explain the meaning of *capacity of a swimming pool*. (2)
- 4.2.3 Calculate, rounded to the nearest litre, the difference in volume of the two swimming pools.

You may use the following formulae:

Volume of a cylinder = 3,142 × (radius)² × depth

Volume of a rectangular prism = length × width × depth (8)

- 4.2.4 The total inner surface of the cylindrical pool will be tiled. An additional 10% tiles were purchased.

You may use the following formula:

Surface area of an open cylinder

= 3,142 × radius × (radius + 2 × depth)

- (a) Give ONE reason why additional tiles were purchased. (2)
- (b) The tiler states that he requires more than 100 boxes of tiles to complete the tiling.

Verify, showing ALL calculations, whether his statement is valid. (11)

[30]

QUESTION 5

- 5.1

Lanri, Neo and three friends plan to drive to the Sani Pass in KwaZulu-Natal. They will travel from Johannesburg and stay at Mkomazana.

ANNEXURE C shows the route map to Mkomazana.

Use the information above and ANNEXURE C to answer the questions that follow.

- 5.1.1

Write down the road number on which they will travel from exit 99 to Bulwer.

(2)
- 5.1.2

Give the distance from Underberg to Himeville.

(2)
- 5.1.3

After driving 2 km from Himeville, the road splits to the left and the right.

State in which direction (left or right) they must drive.

(2)
- 5.1.4

It is 16 km from Himeville to Mkomazana. The distance between Mkomazana and the hotel is 4,4 km.

Calculate how many kilometres after the split in the road the hotel (indicated with *H on the map) is located.

(3)

- 5.2

Mkomazana offers 2-sleeper and 6-sleeper accommodation options.

The rates given in TABLE 3 are per cottage per night.

TABLE 3: RATES PER COTTAGE PER NIGHT

ACCOMMODATION		RATES	
Options	Names	Midweek	Weekend (Friday and Saturday nights)
2-sleeper	Stone Cottage	R1 150	R1 250
	Rose Cottage		
6-sleeper	Valley Cottage	R2 640	R2 730
	Coot Cottage		

* The single-night surcharge is R200 for a 2-sleeper and R300 for a 6-sleeper.

NOTE: Surcharge is an extra amount that is payable.

Use the information above to answer the questions that follow.

- 5.2.1

Give a possible reason why there is a surcharge on a single-night stay.

(2)
- 5.2.2

Name, with a reason, the cottage you would recommend for the group to book.

(3)
- 5.2.3

Neo states that the total cost for the accommodation will be R8 100 if they stay in the cottage from Thursday to Saturday night.

Verify, showing ALL calculations, whether his statement is VALID.

(5)

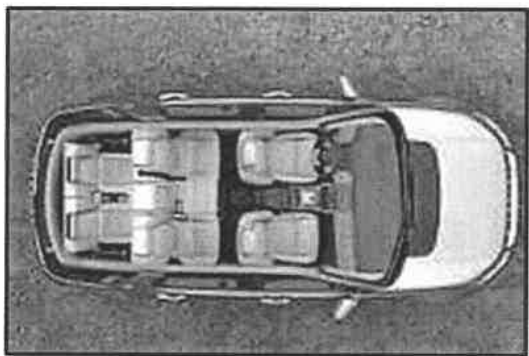
5.3 ANNEXURE C shows the route from Johannesburg to Durban.

The tollgate fees for the Johannesburg to Durban route are as follows:

- T₁ (De Hoek) – R56,00
- T₂ (Wilge) – R77,00
- T₃ (Tugela) – R82,00
- T₄ (Mooi) – R58,00
- T₅ (Marianhill) – R13,50

Lanri, Neo and friends will travel in a Land Rover. The vehicle has a fuel consumption of 6,42 ℓ/100 km and a seating layout as shown below.

THE SEATING LAYOUT OF A LAND ROVER



Use ANNEXURE C and the information above to answer the questions that follow.

5.3.1 Indicate whether the following statements are TRUE or FALSE. If FALSE, give a reason.

- (a) The N3 is the only road on this map with tollgates. (2)
- (b) Howick is on the eastern side of Lesotho. (2)

5.3.2 State the view represented in the layout picture. (2)

5.3.3 The distance from Johannesburg to Mkomazana is 588 km. The Land Rover covers this distance in 7 hours.

Calculate the average speed of this vehicle.

You may use the following formula: **Distance = speed × time** (3)

5.3.4 The accommodation, petrol and tollgate fees for the round trip to Mkomazana will be shared equally amongst all group members.

Calculate the total cost per person.

You may use R21,40 as the fuel price per litre. (9)

[37]

TOTAL: 150



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REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

MAY/JUNE 2024

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages an addendum with 6 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:
 - ANNEXURE A for QUESTION 2.1
 - ANNEXURE B for QUESTION 2.2
 - ANNEXURE C for QUESTION 3.2
 - ANNEXURE D for QUESTION 4.1
 - ANNEXURE E for QUESTION 4.2
 - ANNEXURE F for QUESTION 5.1
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 drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 TABLE 1 below shows a list of explanations and definitions in COLUMN B, and mathematical terms and concepts in COLUMN A.

TABLE 1: TERMS AND CONCEPTS WITH EXPLANATIONS AND DEFINITIONS

COLUMN A	COLUMN B
1.1.1 Circumference	A time measurement equivalent to six hundred seconds
1.1.2 Probability	B the measuring of hotness or coldness
1.1.3 One hour	C the line from one end of a circle to the other end
1.1.4 Temperature	D equivalent to the mass of a person divided by the height squared
	E the boundary that surrounds a circular shape
	F time measurement equivalent to three thousand six hundred seconds
	G the likelihood that something might happen
	H a number showing the relationship between the distance on a map and the actual distance

Use TABLE 1 above and choose an explanation or definition from COLUMN B that matches the term or concept in COLUMN A. Write only the letter (A–H) next to the question numbers (1.1.1 to 1.1.4) in the ANSWER BOOK, e.g. 1.1.5 J. (8 x 1) (8)

1.2 The three sketches below represent the same portion of the physical world which is drawn using three different scales (A, B and C) in random order.

Sketch 1	Sketch 2	Sketch 3

The following scales (in random order) were used to draw these sketches:

A 1 : 100 000
B 1 : 25 000
C 1 : 50 000

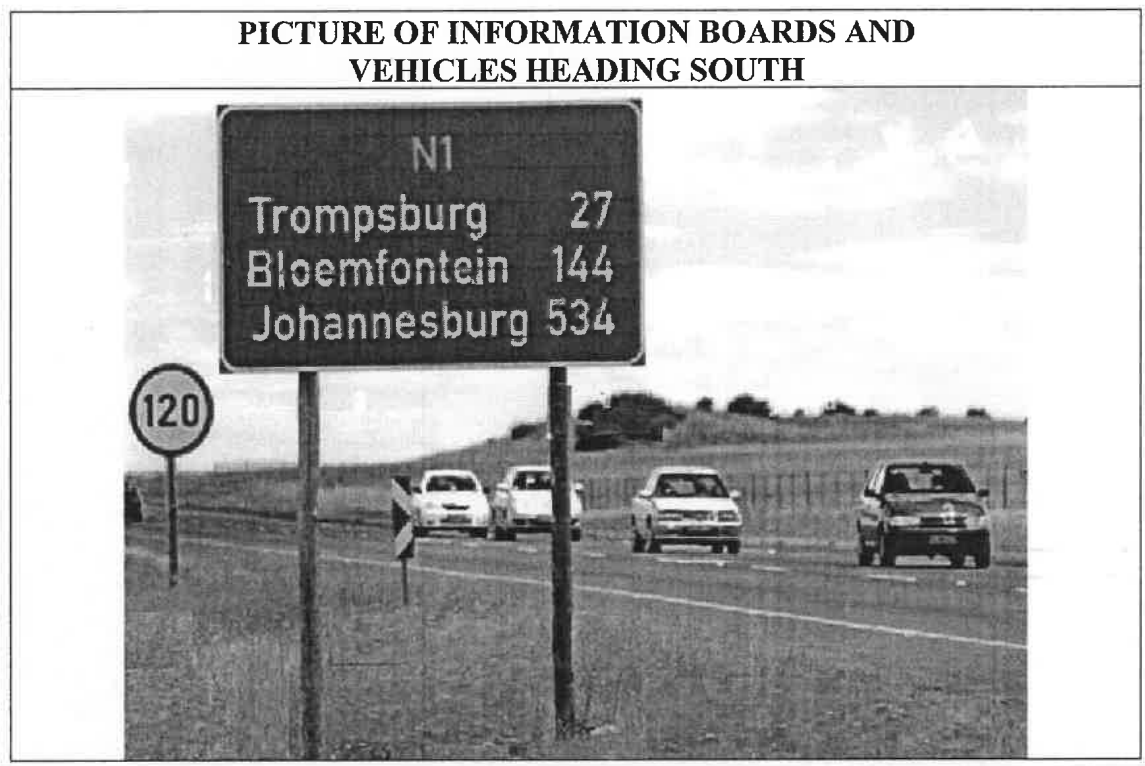
Use the information and sketches above to answer the questions that follow.

- 1.2.1 Name the type of scale used to draw the sketches above. (2)
- 1.2.2 Interpret the scale 1 : 50 000. (2)
- 1.2.3 Write down the scale that was used to draw Sketch 2. (2)

1.3

The picture below shows information boards (a traffic sign and distance information) and vehicles heading in a southerly direction.

The numbers displayed next to the names of the towns on the information board show the distance in kilometres from the information board to that town.



Use the information above to answer the questions that follow.

1.3.1 Give the shapes of the information boards. (2)

1.3.2 Write down the distance a motorist must still travel, in a northerly direction, to reach Bloemfontein. (2)

1.3.3 The 120 on the traffic sign board indicates 120 km/h.

Interpret 120 km/h in context. (2)

1.3.4 Determine the distance from Trompsburg to Johannesburg. (2)

1.3.5 State the general direction of Trompsburg from the information sign. (2)

1.3.6 The length of one of the road signs is 90 cm.

Convert this length to metres. (2)

[26]

QUESTION 2

2.1

ANNEXURE A shows the site map of the Bloem Agricultural Show and the entrance gates to the showgrounds.

The main exhibition halls are named Protea, Daisy, Tulip and Lily.

The Daisy Hall has a length of 65 m.

Use ANNEXURE A and the information above to answer the questions that follow.

- 2.1.1 Write down the gate number for the main public entrance. (2)
- 2.1.2 State the maximum number of public parking areas available. (2)
- 2.1.3 Determine the number of gates used by vehicles. (2)
- 2.1.4 Write down only the letter that makes the following statement TRUE:

 The probability of finding a gate on the eastern side of the site is ...

 A impossible.
 B an even chance.
 C certain. (2)
- 2.1.5 Give the general direction of Gate 12 from the Amusement Park. (2)
- 2.1.6 A layout plan will be drawn of this site map using a scale of 1 : 8 000.

 Determine, rounded to the nearest mm, the length of the Daisy Hall on
 this layout plan. (4)

2.2

One of the exhibitors sells pedal go-karts for kids (see picture alongside), which requires parts to be assembled in order to ride the pedal go-kart.

ANNEXURE B shows assembly instructions arranged in two columns. In COLUMN A are written instructions arranged in order and in COLUMN B are visual instructions (pictures), not arranged in any specific order.

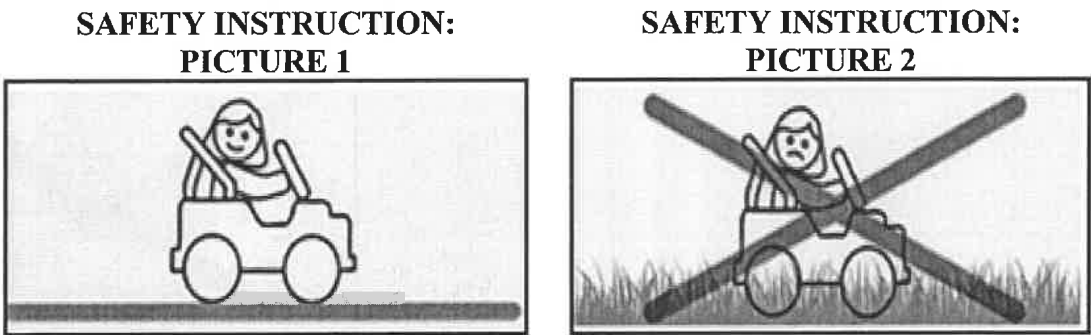
PICTURE OF A COMPLETED PEDAL GO-KART FOR KIDS



Use ANNEXURE B and the information above to answer the question that follows.

Choose a picture from COLUMN B that matches the written instruction in COLUMN A. Write only the letter (A–E) next to the question numbers (2.2.1 to 2.2.5), e.g. 2.2.6 F. (5 x 1) (5)

2.3 The pictures below illustrate safety instructions for using the pedal go-kart.



Write down an explanation for ONE of the safety instructions illustrated in the pictures above. (2)

2.4 TABLE 2 below shows the number of horses, small livestock and cattle from the Free State, Gauteng and other provinces on display at the Bloem Agricultural Show. One value (X) has been omitted.

TABLE 2: THE NUMBER OF HORSES, SMALL LIVESTOCK AND CATTLE ON DISPLAY FROM VARIOUS PROVINCES

PROVINCES	HORSES	SMALL LIVESTOCK	CATTLE	TOTAL
Free State	612	1 476	363	2 451
Gauteng	163	X	62	565
Other	585	1 024	371	1 980
TOTAL	1 360	2 840	796	4 996

[Adapted from Bloemshow/factsheet.pdf]

Use TABLE 2 to answer the questions that follow.

2.4.1 Determine missing value X. (2)

2.4.2 Write down, in simplified fractional form, the probability of NOT randomly selecting a horse from the total number of animals shown in TABLE 2 above. (3)

2.4.3 A farmer visits the display where all the cattle are kept. He is specifically interested in purchasing cattle from the Free State.

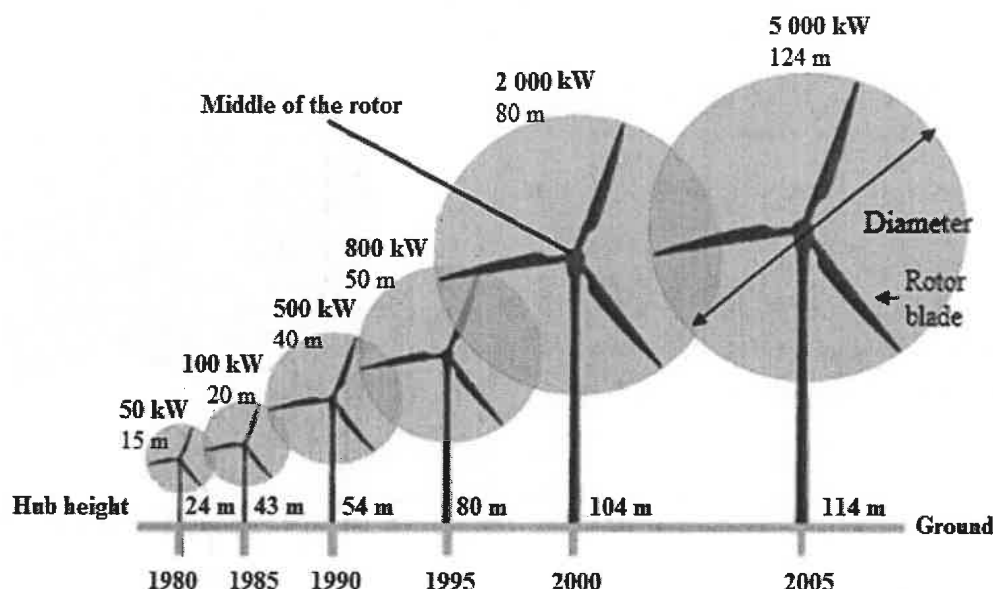
Calculate, as a percentage, the probability of the farmer randomly selecting cattle from the Free State. (3)
[29]

QUESTION 3

3.1 Wind turbines are used as an alternative way to generate electricity.

The picture below shows how the size of the wind turbine and the generation capacity has changed from 1980 to 2005.

**PICTURES OF WIND TURBINES AND GENERATION CAPACITY
USED FROM 1980 to 2005**

**NOTE:**

Hub height = distance from the ground to the middle of the wind turbine's rotor

5 000 kW: Power generation of 5 000 kilowatt

124 m: Diameter of the circle made by the rotor blades of the wind turbine = 124 m

Area of a circle = $3,142 \times \text{radius}^2$

Use the information above to answer the questions that follow.

- 3.1.1 Write down the amount of power generated by the wind turbine with the second-tallest hub height. (2)
- 3.1.2 Give ONE possible reason why the rotor blade size of the wind turbine from 2005 is larger than the rotor blade size of the wind turbine from 1980. (2)
- 3.1.3 Calculate, in metres, the maximum height that the tip of the rotor blade of the tallest wind turbine can reach as it turns. (3)
- 3.1.4 Anam says that the area covered by the rotor blade of the tallest wind turbine in motion is $12\,077,748\text{ m}^2$.
Verify, with calculations, whether or not her statement is VALID. (4)
- 3.1.5 Determine the percentage increase in power generation from 1995 to 2005. (4)
- 3.1.6 Give ONE other possible source of generating electricity that can be used in South Africa. (2)

3.2

A completed rectangular-based compost box is made up of three sections sharing some common panel boards. The sections are assembled by slotting panel boards into panel posts.

ANNEXURE C shows a rectangular compost box linking sections A, B and C with some common panel boards.

Some dimensions of the compost box are also shown.

You may use the following formulae, where applicable:

Perimeter of a rectangle = $2 \times (\text{length} + \text{width})$

Volume = length $\times$ width $\times$ height

$1 \text{ m}^3 = 1\,000 \text{ litres}$

Use ANNEXURE C and the information above to answer the questions that follow.

3.2.1 Calculate the perimeter of the base of the compost box. (4)

3.2.2

- First, the boxes of Section A and Section C were completely assembled.
- The box in Section B fits in between Section A and Section C.
- Section B has fewer front panel boards than the back and shares side panel boards with Section A and Section C, as shown on ANNEXURE C.

Determine how many additional panel boards are required to completely assemble the box in Section B. (3)

3.2.3 The maximum height of the decomposing compost matter in each section, C : B : A, is in the ratio 3 : 5 : 7.

Determine, in litres, the total capacity for the decomposing matter in Section A and Section B. (6)

3.3 If the temperature rises above 70°C , the compost will sterilise itself (kill the good micro-organisms).

Convert this temperature to degrees Fahrenheit.

Use the formula: $^\circ\text{C} = \frac{5}{9} \times (^\circ\text{F} - 32^\circ)$ (3)
[33]

QUESTION 4

4.1 Anda is a teacher in Zambia. ANNEXURE D shows a detailed layout plan of the school building where he teaches.

Use the information in ANNEXURE D to answer the questions that follow.

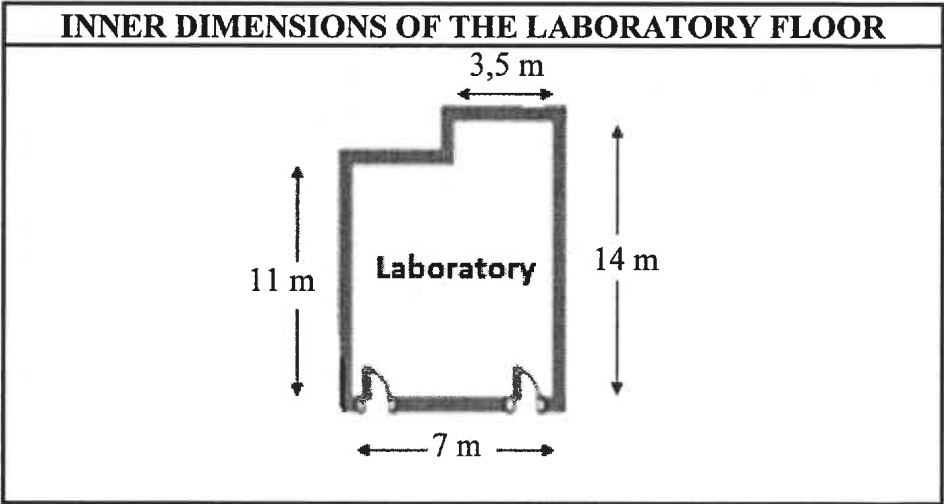
- 4.1.1 Write down, in simplified form, the ratio of the number of single doors to the number of double doors on the school layout plan. (3)
- 4.1.2 Name the rooms that have TWO double doors and ONE single door. (3)
- 4.1.3 State ONE feature that indicates that the school has more than one level. (2)
- 4.1.4 During an evacuation drill, Anda took the following route:
 - Exited the room and turned left into the hallway
 - Went straight past three single doors on the left and a fire extinguisher on the right
 - Turned right at the end of that hallway
 - Passed two rooms each having a double door
 - Then used the 'Exit to use in case of fire'

Determine the room from which Anda exited during the evacuation drill. (3)

4.1.5 The laboratory floor needs to be re-tiled.

The dimensions of the tiles that will be used are: 600 mm × 600 mm.
There are five tiles in a box.

The sketch and inner dimensions of the laboratory floor are below.



The science teacher claimed that they would need a minimum of 40 boxes of tiles to tile the laboratory floor if cutting and breakages are ignored.

Verify, showing ALL calculations, if his claim is VALID.

Use the formula: **Area of a rectangle = length × width** (10)

4.2

Anda uses the strip map in ANNEXURE E to plan his travels.

ANNEXURE E shows the strip map of roads connecting Zambia to South Africa.

Use the information in ANNEXURE E to answer the questions that follow.

4.2.1 Write down the total number of countries shown on the strip map. (2)

4.2.2 Name the town that is 403 km from Bulawayo. (2)

4.2.3 Anda travelled from Victoria Falls to Bulawayo. He had to pick up a friend from Hwange N.P. before reaching Bulawayo. Anda left Victoria Falls at 09:55 and travelled at an average speed of 97 km/h to Hwange N.P.

(a) Determine, to the nearest minute, at what time he reached his friend.

You may use the formula: **Speed = distance ÷ time** (5)

(b) Calculate the total distance he travelled from Victoria Falls to Bulawayo. (3)

[33]

QUESTION 5

- 5.1 Bontle owns a four-storey building with eight similar apartments, which she rents out. ANNEXURE F shows the layout plan of the ground floor of the four-storey building showing two apartments.

PICTURE OF THE FRONT OF THE APARTMENT BUILDING



The total exterior length of the building is 58 feet.

Use ANNEXURE F and the information above to answer the questions that follow.

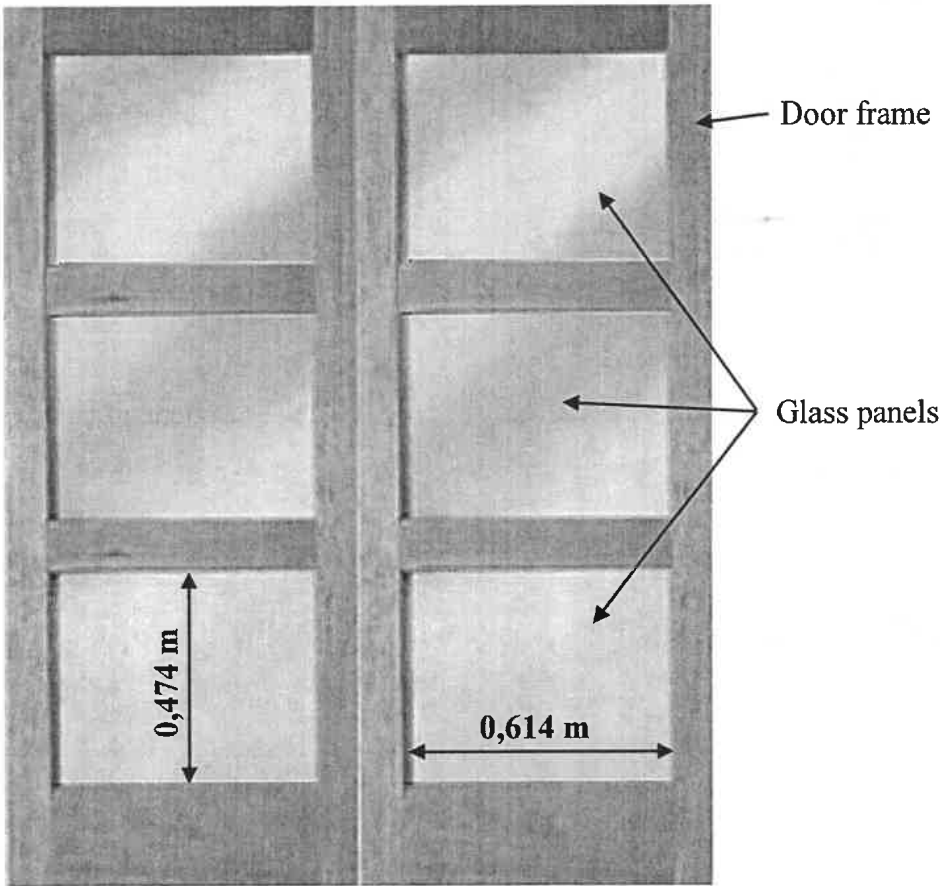
- 5.1.1 Write down the number of enclosed balconies in this building. (2)
- 5.1.2 Calculate, in feet, missing value A on the layout plan. (5)
- 5.1.3 Give ONE valid reason why Bontle stated that the apartments are open-plan living. (2)
- 5.1.4 Identify the name of ONE common feature found in each of the bathrooms. (2)
- 5.1.5 One of the apartment entrance doors has 3B as a number. (2)
Give a possible interpretation of this number.
- 5.1.6 Bontle calculated the exterior length of the building to be 17,6784 m. (3)
(a) Determine, rounded to THREE decimal places, the conversion factor she used in the form 1 m = ... feet.
(b) Hence, convert to metres the exterior width of the building.

5.2 The entrance door of the apartment building is a double door with six equally sized glass panels.

Bontle wants to replace all the glass panels with laminated safety glass. She received the following information:

- Mass of the safety glass is 15 kg per m²
- Price of the safety glass is R490 per m²
- Delivery charge is R820 for the first 20 kilograms, and thereafter R53,50 per kg, or part thereof
- Consider only the inner measurements for glass panels (ignore overlaps)

PICTURE OF THE ENTRANCE DOOR WITH INNER DIMENSIONS OF THE ORIGINAL GLASS PANELS



You may use the formula: **Area of a rectangle = length × width**

5.2.1 Calculate, rounded to ONE decimal place, the area of ONE glass panel. (2)

5.2.2 Bontle stated that it will cost her less than R2 000 for the purchase and delivery of all the safety glass panels for the double door.

Verify, showing ALL calculations, whether her statement is VALID. (8)
[29]

TOTAL: 150



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Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2023

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages and an addendum with 4 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

ANNEXURE A for QUESTION 2.3
ANNEXURE B for QUESTION 4.1
ANNEXURE C for QUESTION 4.2
ANNEXURE D for QUESTION 5.3
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 drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 TABLE 1 below contains a list of explanations and definitions of concepts used in Mathematical Literacy.

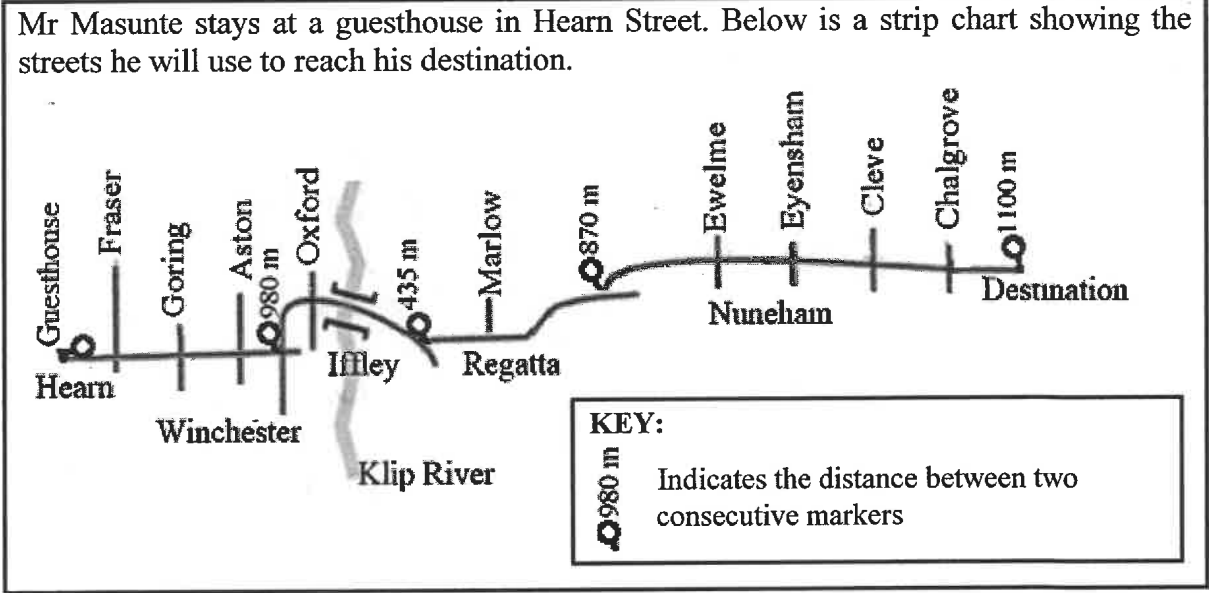
TABLE 1: EXPLANATIONS AND DEFINITIONS OF CONCEPTS

A	A drawing showing the streets for a person who drives a car
B	Visual indication of the real-life distance and its distance on the map
C	The boundary that surrounds a circular-shaped object
D	A position which roughly shows the location of an object
E	The sum of the areas of all the faces of a 3D object
F	The rate of covering a certain distance
G	The amount of space that is enclosed by the perimeter of an object

Use TABLE 1 above to write down the letter of the explanation or definition (A to G) of EACH of the following concepts:

- 1.1.1 Bar scale (2)
- 1.1.2 Surface area (2)
- 1.1.3 Road map (2)
- 1.1.4 Speed (2)

1.2 Mr Masunte stays at a guesthouse in Hearn Street. Below is a strip chart showing the streets he will use to reach his destination.



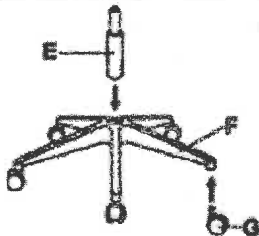
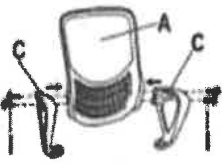
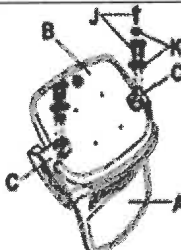
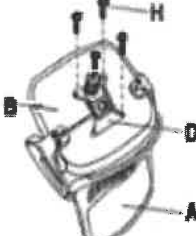
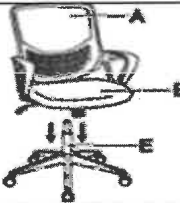
[Adapted from https://scoutwiki.scouts.org.za/wiki/Strip_maps]

Use the information above to answer the questions that follow.

- 1.2.1 Write down how many streets Mr Masunte must cross before turning into Winchester Street. (2)
- 1.2.2 Name the street that goes over the Klip River. (2)
- 1.2.3 Calculate the total distance from the guesthouse to his destination. (3)

1.3

Illustrated below are the steps and components needed to assemble a chair. The components to assemble the chair are labelled alphabetically (A–K).

STEPS TO ASSEMBLE A CHAIR					
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	COMPLETED CHAIR
					

COMPONENTS NEEDED TO ASSEMBLE THE CHAIR					
A Chair back	B Chair seat	C Seat mechanism	D Gas lift	E Chair base	F Chair arms
					
G Casters	H Screws	I Screws	J Screws	K Washer	L Assembly tool: Allen key
					

[Source: <http://www.bing.com>]

Use the information above to answer the questions that follow.

- 1.3.1 Determine how many different types of screws are needed to assemble the different parts of the chair. (2)
- 1.3.2 Use the steps to assemble a chair to identify the following: (2)

(a) The letter that indicates the chair base (2)

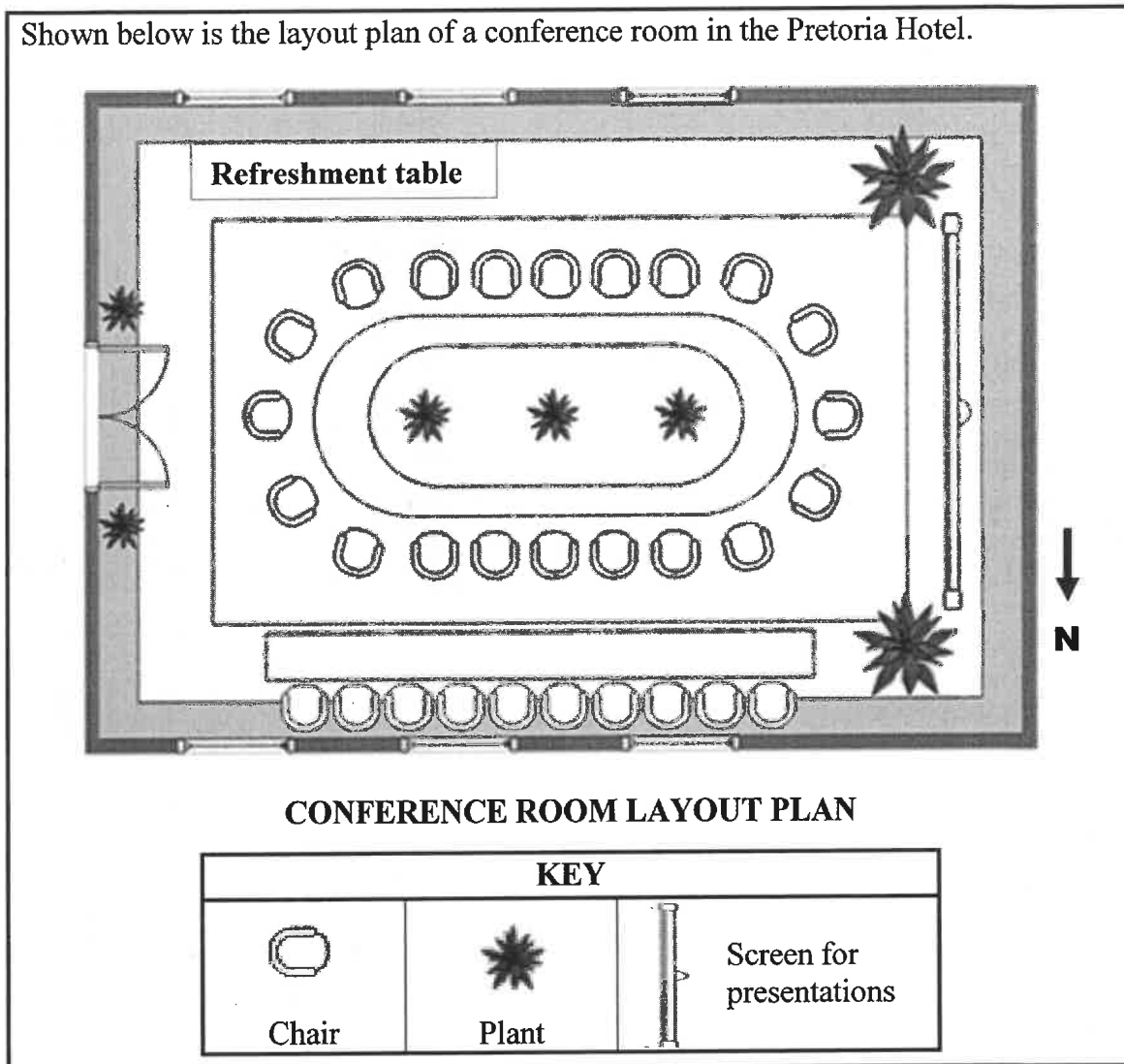
(b) The number of screws used in step 4 (2)
- 1.3.3 Name the tool needed to assemble the chair. (2)
- 1.3.4 Identify the component of the chair that comes as a pair. (2)

[25]

QUESTION 2

2.1

Shown below is the layout plan of a conference room in the Pretoria Hotel.



Use the information above to answer the questions that follow.

- 2.1.1 Define the term *layout plan*. (2)
- 2.1.2 Write down the total number of chairs around the oval-shaped table. (2)
- 2.1.3 Which ONE of the following statements regarding the conference room layout is TRUE? (2)
- A The screen is on the eastern side of the room.
 - B The screen covers some windows.
 - C The screen is opposite the door leading into the room.
- 2.1.4 Give ONE possible reason why plants are NOT placed on the table on the northern side of the room. (2)
- 2.1.5 The actual outside length of the conference room is 12 m. (2)
- (a) Measure the outside length of the conference room on the layout plan. (2)
 - (b) Hence, calculate the scale used in this layout plan. (3)

2.2

A single layer of the bottled water will be packed on a rectangular base. The packed bottled water will occupy half of the length of the rectangular refreshment table and will not overlap the edges of the table.

Shown below are the pictures and the dimensions of the top of the rectangular refreshment table and the packed bottled water.

DIMENSIONS OF THE RECTANGULAR REFRESHMENT TABLE TOP	PACKED BOTTLED WATER (Rectangular base packaging)
 Refreshment table Width = 49 cm Length = 290 cm	 Width = 24,2 cm Length = 36,4 cm

Calculate the maximum number of packed bottled water that can fit on this half of the table.

(8)

2.3

On ANNEXURE A is a road map and area information directing the conference attendees to the Pretoria Hotel.

Use ANNEXURE A to answer the questions that follow.

2.3.1 State the general direction of the Atterbury Road off-ramp from the Fountains Circle.

(2)

2.3.2 Explain the phrase, 'Map is not drawn to scale'.

(2)

2.3.3 Complete: Pretoria Hotel is at the corner of ... and ... Streets.

(2)

2.3.4 State the probability of having a traffic light at Brooklyn Circle.

(2)

2.3.5 Give ONE reason why some streets are numbered from 1 to 7.

(2)

2.3.6 A receptionist at the Pretoria Hotel has to report for work by 05:30.

She takes 10 minutes to walk from home to board a taxi.

- She leaves home at 04:55.
- She rides in a taxi for 20 minutes.
- She walks 5 minutes from the taxi stop to the hotel.

Verify whether or not the receptionist will get to work on time.

(4)

[35]

QUESTION 3

3.1

Andrew and Duncan went fishing for carp on a friend's farm.

NOTE: Carp is a large freshwater fish that can be eaten by humans.

- 3.1.1
- A female carp can lay 2,7 million eggs.
- Write 2,7 million in full, using numerals only.
- (2)
- 3.1.2
- Andrew caught a carp with a mass of 2,375 kg. Duncan caught two carp, one weighing 1,2 kg and the other 750 g.
- Determine, in kg, the total mass of the carp they caught.
- (3)

3.2

Andrew wants to erect a Vibracrete wall on the boundary of his property.

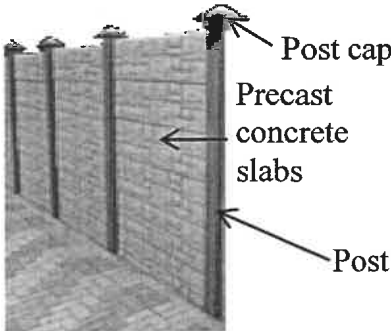
The wall will consist of concrete posts with precast concrete slabs between them.

The wall will have 12 posts planted into the ground using concrete.

On top of each post, he will place a post cap.

For each post, Andrew digs a square hole in the ground with a side length of 30 cm and a depth of 60 cm.

PICTURE OF A VIBRACRETE WALL



Use the information above to answer the questions that follow.

- 3.2.1
- Calculate, in m³, the total capacity of all the holes dug for the required posts.
- You may use the formula:
- Volume = length × width × depth
- (5)
- 3.2.2
- Andrew mixed the same volume of concrete as the volume calculated in QUESTION 3.2.1.
- Give an explanation why he had some concrete left over after planting all the posts in the holes with concrete.
- (2)
- 3.2.3
- The concrete is made from a mixture of cement, river sand and stone in the ratio as illustrated below.

Cement	River Sand	Stone
 50 kg		
1 Bag	2 Wheelbarrows	2 Wheelbarrows

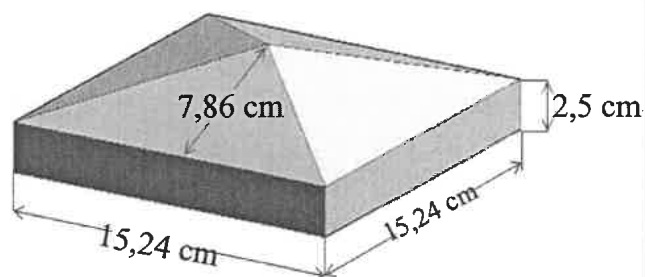
- 0,75 m³ of concrete requires 5,5 bags of cement.
- One level wheelbarrow full of river sand weighs 102 kg.
- Calculate the mass of river sand needed to make 1 m³ of concrete.
- (6)

3.3

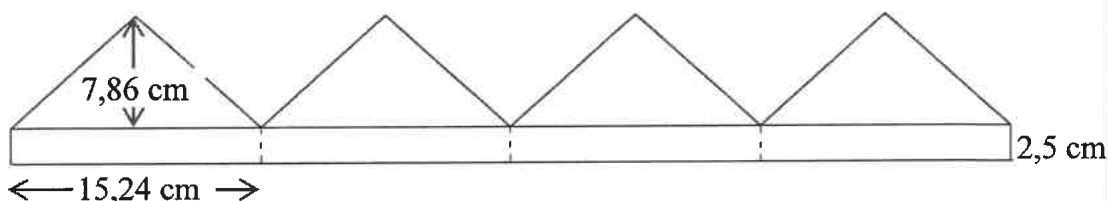
The square-based post cap has a side length of 15,24 cm and a constant height of 2,5 cm.

The perpendicular height of the triangular face is 7,86 cm, as shown in the diagram alongside.

DIMENSIONS OF THE POST CAP



NET OF THE FACES OF ONE OF THE POST CAPS TO BE PAINTED



Andrew will paint two sides of each of the concrete posts (each is 125 mm wide and 1,6 m long) and all the outside faces of the post caps.

The following formulae may be used:

Area of a rectangle = length $\times$ width

Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{perpendicular height}$

Use the information above to answer the questions that follow.

3.3.1 Calculate, in cm^2 , the total area of all the post sides that have to be painted. (4)

3.3.2 Duncan stated that the total area of all the posts and the post caps to be painted was $52\,704\text{ cm}^2$, rounded to the nearest whole number.

Verify, showing ALL calculations, whether his statement is VALID. (8)

3.3.3 The spread rate of the paint is $12,46\text{ litre/m}^2$.

Calculate how many litres of paint is needed to paint $52\,704\text{ cm}^2$. (3)
[33]

QUESTION 4

4.1

A programme inspiring people of all ages and genders usually ends with a fashion show.

ANNEXURE B shows the layout of the runways and the seating arrangements at the fashion show.

Next to the floor runway are single seats arranged in rows. Each round table next to the raised runway can seat a maximum of 10 adults.

Each of the runways is 4 feet wide.

NOTE: 1 m = 3,28084 feet

Use the information above and ANNEXURE B to answer the questions that follow.

4.1.1 Write, in simplified form, the ratio of the width to the length of the raised runway. (3)

4.1.2 Convert the length of the floor runway to metres. (3)

4.1.3 Give a possible reason for EACH of the following:

(a) Why the second- and third-row seats are not arranged exactly behind the first-row seats that are closest to the floor runway (2)

(b) Why there is a gap between the two runways (2)

4.1.4 The diameter of the round table is 1,8288 m.

You may use the following formulae in the questions that follow:

Area of a circle = $3,142 \times \text{radius}^2$

Circumference of a circle = $3,142 \times \text{diameter}$

(a) Calculate the area of the top of ONE round table. (3)

(b) Each person occupies an equal length of the outer edge around the round table.

Determine the maximum length allocated to each person seated around the round table. (4)

4.2

The girls participating in the fashion show need dresses that fit well. The fashion show uses an **equal number** of girls for each size.

ANNEXURE C shows a body type chart used to select the correct dress size.

Use ANNEXURE C and the information above to answer the questions that follow.

- 4.2.1 Write down the body size for a girl with a mass of 55 kg and a height of 1,6 m. (2)
- 4.2.2 State the mass of a girl with a height of 1,75 m wearing dress size 14–16. (2)
- 4.2.3 Calculate the body mass index (BMI) of a girl who weighs 70 kg and is 1,50 m tall.
You may use the formula:
$$\text{BMI} = \frac{\text{mass (kg)}}{(\text{height in metres})^2}$$
 (3)
- 4.2.4 Write, as a percentage, the probability of randomly selecting a girl who weighs 50 kg and wears an XS dress. (2)
- 4.2.5 Bonolo stated that the probability of randomly selecting a girl wearing a dress with body size smaller than XXL is 0,833.
Verify, with calculations, whether her statement is VALID. (4)
- [30]

QUESTION 5

5.1

Ice is usually used in cool drinks to further cool them.

Ice can be made by freezing water in different shapes.

Cubes are the most common shape used to make ice.

PICTURE OF ICE CUBES AND
DIAGRAM OF AN ICE CUBE



Side length of the cube = 4,5 cm

Use the information above to answer the question that follows.

Determine the surface area of a cube.

You may use the formula: **Surface area of a cube = $6 \times \text{side length}^2$** (3)

5.2

Countries surrounding the North Pole have started building ice hotels for travellers to stay overnight.

The hotel buildings, with furniture and decorations, are made of big blocks of ice, each weighing two tons.

Blocks of ice are stacked on top of each other to build a room.

Ice can also be carved to form different shapes.

ICE HOTEL



Ice carved to make a frame
for taking photos



Use the information above to answer the questions that follow.

5.2.1 Calculate the total mass (in kg) of a wall built with 60 big blocks of ice.

NOTE: 1 kg = 0,001 ton (4)

5.2.2 A block of ice was carved out to make a circular opening. The carved-out ice was melted resulting in water with a volume of 38 500 cm³.

Calculate the volume of the ice that was carved out.

You may use the formula: **Volume of water = volume of ice $\times$ 0,92** (3)

5.3

Alaska is one of the states in the USA. Anchorage is the largest city in Alaska.

ANNEXURE D shows a part of the globe indicating the shortest distances, in nautical miles, between Anchorage and a few selected cities in the world.

NOTE: 1 nautical mile = 1,151 miles
1 km = 0,6215 miles

Use ANNEXURE D and the information above to answer the questions that follow.

- 5.3.1 Determine, in nautical miles, the difference in the distances from Tokyo to Honolulu and from Washington to Anchorage. (3)
- 5.3.2 Convert, to kilometres, the distance from Berlin to Anchorage. (4)
- 5.3.3 Cargo needs to be shipped from Los Angeles to Honolulu and then from Honolulu to Tokyo.

Phenyo searched the internet to determine how long it would take the cargo to reach its destination. Shown below are the search results. Some information has been omitted.

OCEAN ROUTE		TIME	DISTANCE
USLAX Los Angeles	 USHNL Honolulu	10 days 4 hours	2 607 nautical miles
USHNL Honolulu	 JPYOK Tokyo	...	3 350 nautical miles

NOTE: Ships sail 24 hours a day.

- (a) Calculate the average speed of the ship, rounded to TWO decimal places, in nautical miles per hour.

You may use the formula: **Distance = speed × time** (4)
- (b) Hence, determine the date and time of arrival in Tokyo if the ship leaves Honolulu on 24 September at 16:00 and sails at the same average speed. (6)
- [27]

TOTAL: 150



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2025

MARKS: 150

TIME: 3 hours

**This question paper consists of 15 pages and
a SPECIAL ANSWER BOOK of 17 pages.**

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions.
2. Answer ALL the questions ONLY in the SPECIAL ANSWER BOOK provided.
3. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
4. Show ALL calculations clearly.
5. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
6. Indicate units of measurement, where applicable.
7. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
8. Write neatly and legibly.

QUESTION 1.

1.1

TABLE 1 below contains a list of statements and definitions of concepts used in Mathematical Literacy.

TABLE 1: STATEMENTS AND DEFINITIONS OF CONCEPTS

LETTER	DEFINITIONS
A	The three-dimensional space that is occupied by a gas, liquid or solid substance
B	Visual representation of the exterior sides of a building
C	Diagram of a real-life object drawn to scale
D	The region covered by the shape or object
E	The result of speed, in km/h, multiplied by the time, in hours
F	Distance around the outside of a shape
G	Scale where one unit on the map represents 50 000 units in reality
H	Shows the design and dimensions of the inside of a building, viewed from the top
I	The area of all the faces of an object added together
J	The result of speed, in km/h, divided by the time, in hours

Use TABLE 1 above and match an explanation or a definition with EACH of the concepts below. Write only the letter (A–J) next to the question numbers (1.1.1 to 1.1.5), e.g. 1.1.6 K.

- 1.1.1

Elevation plan

(2)
- 1.1.2

Number scale

(2)
- 1.1.3

Volume

(2)
- 1.1.4

Distance

(2)
- 1.1.5

Perimeter

(2)

1.2

Shown below is the information regarding a South African Airways flight from Cape Town to Johannesburg.



South African Airways

Wednesday 8 January 2025

Distance	Aircraft	Codeshare
1 278 km	Boeing 737-800	NZ 3120

Flight number: SA332

Maximum number of passengers: 189

Departure	Arrival
12:15 Cape Town	14:15 Johannesburg

[Adapted from <https://www.flysaa.com>]

Use the information above to answer the questions that follow.

1.2.1 State, in words, the arrival time of the flight using the 12-hour format. (2)

1.2.2 Only $33\frac{1}{3}\%$ of the maximum number of passengers were on board this flight.

Calculate the number of passengers on this flight. (2)

1.2.3 Write down which ONE of the methods below is the CORRECT method to calculate the speed in km/h of the aircraft.

Write only the letter (A–C) next to the question number (1.2.3).

- A

$\frac{1\,278}{14:15}$
- B

$\frac{1\,278}{2}$
- C

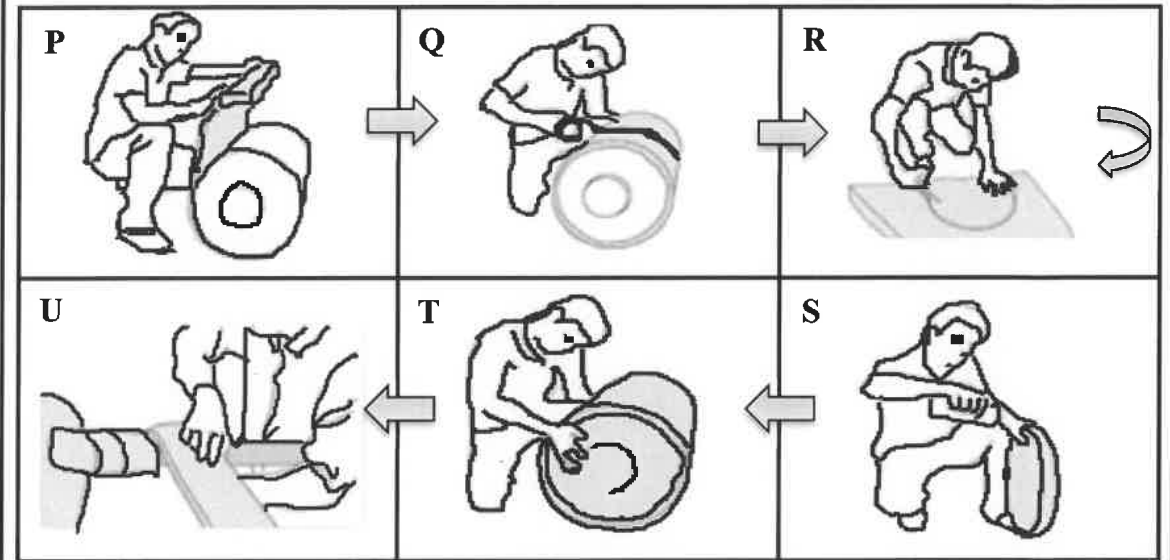
$\frac{2}{1\,278}$
- (2)

1.2.4 State which day of the week was 26 December 2024. (2)

1.3

One way to save money during winter is to wrap the geyser and waterpipes with a geyser blanket. A geyser blanket is made of aerolite which can easily be cut.

The pictures below show the steps to wrap the geyser in aerolite.



[Adapted from www.21homeinsulations.co.za]

NOTE: Aerolite is insulating material that allows heat to stay in an object.

Use the information above to answer the questions that follow.

1.3.1 Write down the letter (P–U) of the picture that matches EACH of the following statements:

- (a) Cut out circles of the aerolite to be placed on both ends of the geyser.
- (b) Apply glue to the circular pieces of the aerolite.
- (c) The strips of aerolite are wrapped around the pipes.
- (d) Roll the aerolite around the lateral surface of the geyser.
- (e) Use duct tape to secure the aerolite around the lateral surface.
- (f) Attach the circular pieces of the aerolite to the geyser. (6)

1.3.2 Choose ONE of the following formulae that can be used to calculate how much aerolite is needed for the total surface area of the geyser only.

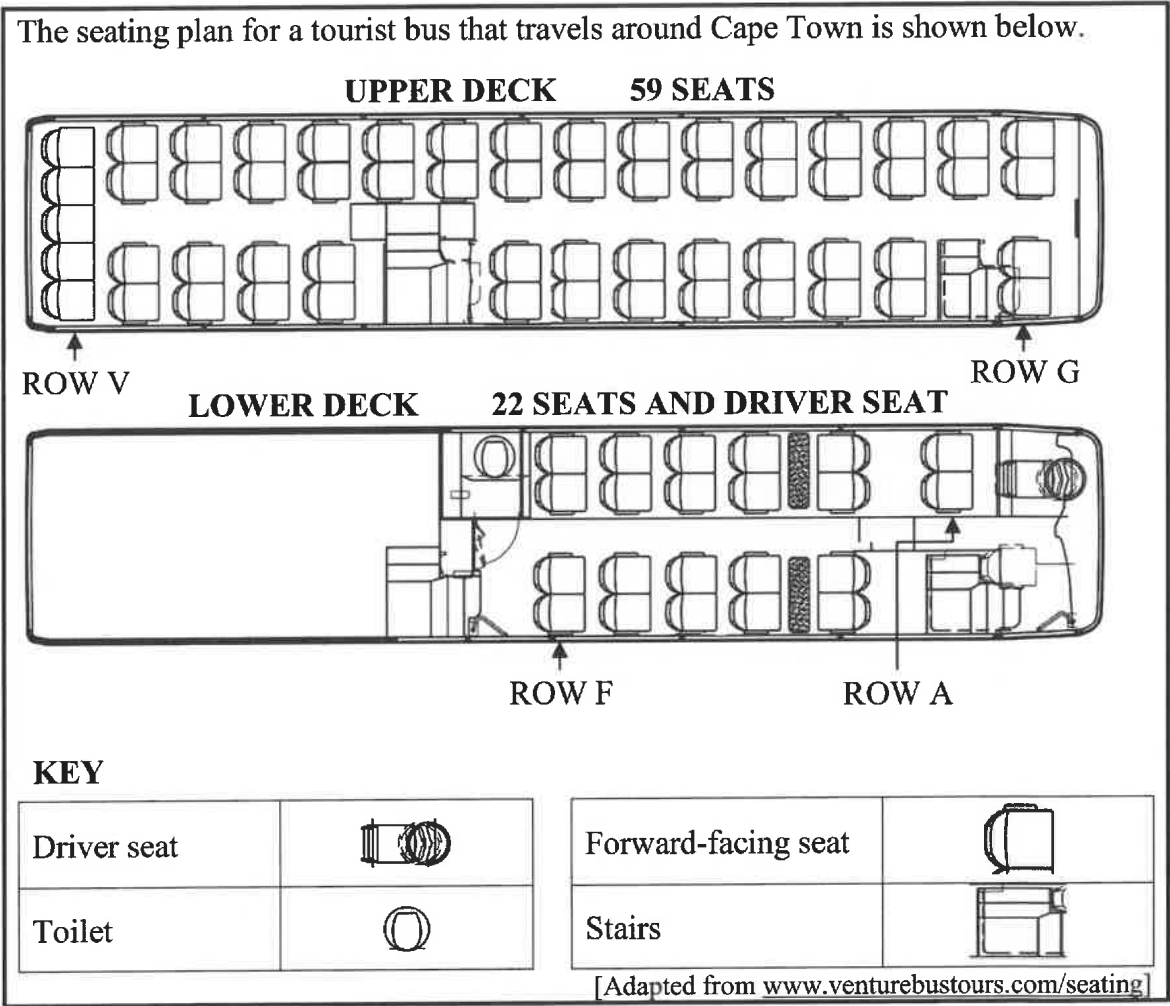
Write only the letter (A–D) next to the question number (1.3.2).

- A $\pi \times \text{radius}^2 \times \text{height} + 2 \times \pi \times \text{radius}$
- B $\pi \times \text{radius} \times \text{height} + \text{length} \times \text{width}$
- C $2 \times \pi \times \text{radius} \times \text{height} + 2 \times \pi \times \text{radius}^2$
- D $\frac{1}{2} \text{base} \times \text{height}$ (2)

1.3.3 The length of the geyser is 1,2 m. Convert this measurement to mm. (2)
[28]

QUESTION 2

2.1 The seating plan for a tourist bus that travels around Cape Town is shown below.



Study the information above and answer the questions that follow.

- 2.1.1 Determine the number of forward-facing passenger seats on this bus. (2)
- 2.1.2 The seats are numbered according to the following numbering system:
 - A to F is for the lower deck.
 - G to V is for the upper deck.
 - The seats are numbered 1 to 4 from right to left if you are facing the back of the bus.

Write down the seat number which has the easiest access to the toilet. (2)

- 2.1.3 Complete the following paragraph with the directions to move from seat C2 to seat J3 by using the words provided in the list below. Write only the word next to the question numbers (2.1.3(a) to 2.1.3(d)).

aisle; second; left; right; first

Move forward towards the front set of stairs on your (a) ... Use this set of stairs to get to the upper deck. Once on the upper deck, turn (b) ... and you will find your seat on the (c) ... in the (d) ... row from the stairs. (4)

2.2

ANNEXURE A in the ANSWER BOOK shows a route map of a round trip and the 18 stops made by a tour bus.

Use ANNEXURE A to answer the questions that follow.

- 2.2.1 Write down the name of the southern-most stop on this route. (2)
- 2.2.2 Name the type of scale used on this map. (2)
- 2.2.3 State whether the bus will be driving in a clockwise or an anticlockwise direction from stop 11 to stop 18. (2)
- 2.2.4 The distance of a round trip is 19,2 km.

Use the given scale on the map to determine the map distance. (5)

2.3

John lives in a flat in Cape Town. ANNEXURE B in the ANSWER BOOK shows the floor plans of two flats in John's block of flats. Flat 1 is on the ground floor and Flat 2 is on the first floor, which forms part of a block of flats.

Use ANNEXURE B to answer the questions that follow.

- 2.3.1 State whether the bathroom door opens to the (left/right) as you enter the bathroom. (2)
- 2.3.2 Convert the longer dimension of the living room to centimetres. (5)
- 2.3.3 Write down TWO differences between Flat 1 and Flat 2. (4)
- 2.3.4 Give ONE possible reason why Flat 1 does not have a balcony. (2)
- 2.3.5 Explain why there are no windows in the north- and south-facing walls of both plans. (2)

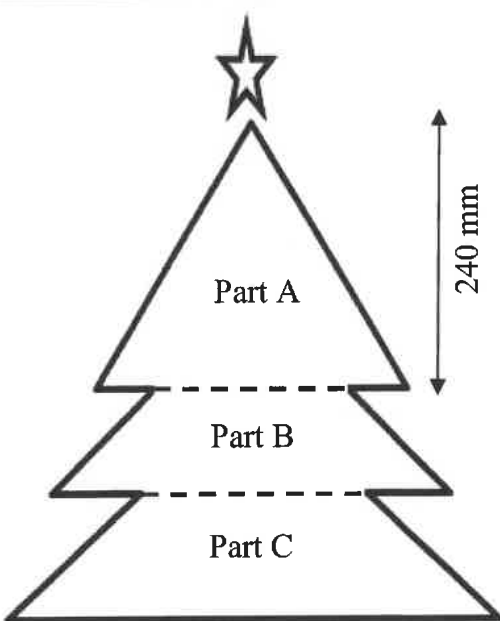
[34]

QUESTION 3

3.1 Mrs Xulu used different recycled materials to make a tree decoration to hang on the wall, as shown in the picture below. She cut out different coloured circles to form the tree pattern.

She made a tree-shaped template using cardboard to form the backing for the coloured circles to be pasted on.

The template was made up of three sections: Part A, Part B and Part C.

PICTURE OF TREE DECORATION	MEASUREMENTS OF CARDBOARD TEMPLATE
	

[Adapted from www.pinterest.com]

NOTE: Dimension of the base of the triangle in Part A = 28 cm

Use the information above to answer the questions that follow.

3.1.1 Mrs Xulu took 3 hours and 27 minutes without any break to cut out the circles. She finished at 13:12.

Determine the time at which Mrs Xulu started cutting out the circles. (2)

3.1.2 In Part A, there are seven rows of circles. The first row consists of one circle at the top and thereafter, each successive row has an additional circle added to complete the rest of the rows.

Calculate the total number of circles in Part A. (3)

3.1.3 Calculate, in cm², the area of Part A.

You may use the following formula:

Area of triangle = $\frac{1}{2}$ **base** × **height** (4)

3.1.4 The area of Part B is 30 240 mm². The area of Part C is 1,6 times the area of Part B.

Calculate, in mm², the total area of the cardboard template. (5)

3.1.5 Mrs Xulu placed all the coloured circles in a container as she cut them out.

TABLE 2 below shows the number of circles and the specific colours that Mrs Xulu cut out.

TABLE 2: NUMBER OF CIRCLES PER COLOUR

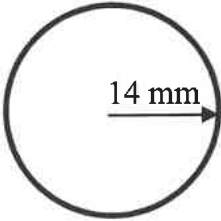
COLOUR OF CIRCLE	NUMBER OF CIRCLES
Red	9
Green	7
Gold	28
Dark denim	8
Mixed colour	22

Determine, as a percentage, the probability of randomly choosing a green circle or a red circle from the container. (4)

3.2 Amanda Xulu, Mrs Xulu's daughter, makes circular-shaped earrings. She sells these earrings at the local flea market.

The radius of the large circle in the picture below is 14 mm.

Shown below is a picture of a pair of earrings and a diagram showing the circles of one earring.

PICTURE OF A PAIR OF EARRINGS	DIAGRAM OF THE CIRCLES OF ONE EARRING
	SMALL CIRCLE  LARGE CIRCLE 
NOTE: Synthetic – not real	[Adapted from www.pinterest.com]

Use the information above to answer the questions that follow.

- 3.2.1

Determine, in mm, the radius of the small circle if it is $\frac{4}{7}$ of the radius of the large circle.

(2)
- 3.2.2

Calculate, rounded to the nearest mm, the circumference of the large circle.

You may use the following formula:

Circumference of circle = $3,142 \times 2 \times \text{radius}$

(3)

- 3.2.3 Amanda decides to make 48 pairs of earrings using flower-patterned synthetic leather for the large circles. Both sides of the large circle are covered using synthetic leather, while the small circle is painted black.

The radius of one large circle is 1,4 cm.

The synthetic leather is sold in rolls with a width of 1,37 m. Amanda buys 30 cm of the synthetic leather.

She states that after cutting the leather for ALL the large circles, the remaining synthetic leather will have an area of less than 3 000 cm².

Verify her statement, showing ALL calculations.

You may use the following formulae:

Area of rectangle = length $\times$ width

Area of circle = 3,142 $\times$ radius²

(9)
[32]

QUESTION 4

4.1

A flamingo (bird) was fitted with a Global Positioning System (GPS) tracking device.

 ANNEXURE C in the ANSWER BOOK shows the map with the tracked flight of the flamingo, starting at point A and ending at point E.

FLAMINGO



Use ANNEXURE C to answer the questions that follow.

- 4.1.1

Name the closest town directly west of Colesberg.

(2)
- 4.1.2

(a) National roads are indicated with a number enclosed in a pentagon, e.g. .

Write down how many different national roads are shown on this map.

(2)

(b) Name the towns found on the N12.

(3)
- 4.1.3

Hanover is a town in the Northern Cape, while Middelburg is a town in the Eastern Cape.

Describe how the provincial borders are indicated on this map.

(2)

4.2

On 13 January 2022, the flamingo was in area A on the map.
 On 13 June 2023, it started moving southwards from area A, the starting point of tracking the bird, and followed the following path:

- On 14 June, the flamingo spent the night at a small pan at area B.
- On 15 June at 19:00, it flew non-stop for 14 hours and 25 minutes to arrive at area E, the end point.

[Adapted from <https://www.news24.com/news24/community-newspaper/noordkaapbulletin>]

Use ANNEXURE C and the information above to answer the questions that follow.

- 4.2.1

Write down the number of months the bird spent in area A.

(2)
- 4.2.2

Determine the bird's date and time of arrival at area E.

(3)
- 4.2.3

Write down the probability that the bird flew directly over Queenstown.

(2)
- 4.2.4

The flight from area B to area E is 770 km.

Calculate (in km/h) the average speed of the bird as it flew from area B to area E.

You may use this formula: **Distance = speed × time**

(4)

- 4.2.5 The direct distance between area B and area E is 311,72 miles.

The person tracking the bird's GPS stated that the bird flew an extra distance of 268,13 km when compared to the direct distance.

1 mile = 1,60934 km

Verify, with calculations, whether this statement is VALID. (5)

- 4.2.6 The biggest flamingo is 59 inches tall, which is approximately 5 feet.

Some interesting facts about a country where flamingos are common:

- Approximately 10% of this country's women are shorter than 5 feet.
- Women make up 50% of this country's population.
- This country has a total population of 333 million people.
- 78% of this country's population are adults.

Calculate, rounded to the nearest million, the number of adult women shorter than 5 feet in this country.

(5)
[30]

QUESTION 5

5.1

Simon is a carpenter. He builds wooden bookcases using wooden pieces for shelves and the frame, and hardboard for the back.

The diagrams on ANNEXURE D in the ANSWER BOOK can be described as follows:

- DIAGRAM 1: Shows wooden pieces for the top, bottom, sides and shelves of a bookcase, with hardboard for the back of the bookcase
- DIAGRAM 2: Shows the hardboard (i.e. the back of the bookcase) and SIX pieces of wood, with dimensions, that will have to be cut out to assemble a single bookcase

Use the information above and ANNEXURE D in the ANSWER BOOK to answer the questions that follow.

- 5.1.1
- Choose the letter (A–G) in DIAGRAM 2 that matches the item in DIAGRAM 1 given below. Write down only the letter next to the question numbers (5.1.1(a) to 5.1.1 (b)).
- (a)

Shelf

(2)
- (b)

Back of bookcase

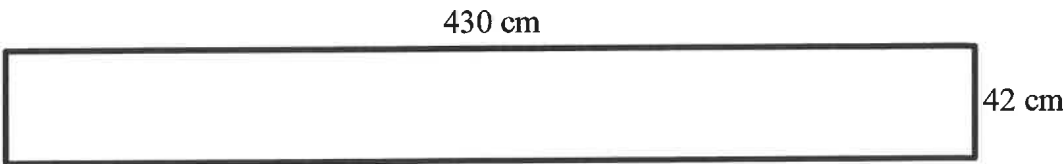
(2)
- 5.1.2
- Write down the probability of randomly placing a book on a shelf with a height greater than 30 cm.
- (2)
- 5.1.3
- The back of the bookcase is made out of hardboard.
- (a)

Explain why the dimensions of the hardboard is 60 cm by 90 cm.

(2)
- (b)

Draw a scaled diagram of the hardboard according to scale 1 : 20.

(6)
- 5.2
- The wooden pieces for two identical bookcases are cut from ONE complete rectangular piece of wood which is 2 cm thick, 42 cm wide and 430 cm long.



Determine the area of the remaining part of the wood after cutting the required material.

You may use the following formula:

Area of rectangle = length × breadth (6)

5.3 The density of the wood is 0,75 g/cm³.

A volume of approximately 0,4 m³ unused wood is accumulated each month.

Simon states that it will take more than three months to accumulate one ton of unused wood.

Verify his statement, showing ALL calculations.

You may use the following formula:

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

(6)
[26]

TOTAL: 150

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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

MAY/JUNE 2025

MARKS: 150

TIME: 3 hours

This question paper consists of 14 pages and a 17-page SPECIAL ANSWER BOOK.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions.
2. Answer ALL the questions in the SPECIAL ANSWER BOOK provided.
3. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
4. Show ALL calculations clearly.
5. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
6. Indicate units of measurement, where applicable.
7. Diagrams are NOT necessarily drawn to scale, unless stated otherwise.
8. Write neatly and legibly.

QUESTION 1

1.1 TABLE 1 below shows a list of Mathematical Literacy terms or concepts in COLUMN A with descriptions in COLUMN B.

Choose a description from COLUMN B that matches the term or concept in COLUMN A. Write only the letter (A–I) next to the question numbers (1.1.1 to 1.1.4) in the ANSWER BOOK, e.g. 1.1.5 J.

TABLE 1: MATHEMATICAL LITERACY TERMS OR CONCEPTS WITH DESCRIPTIONS

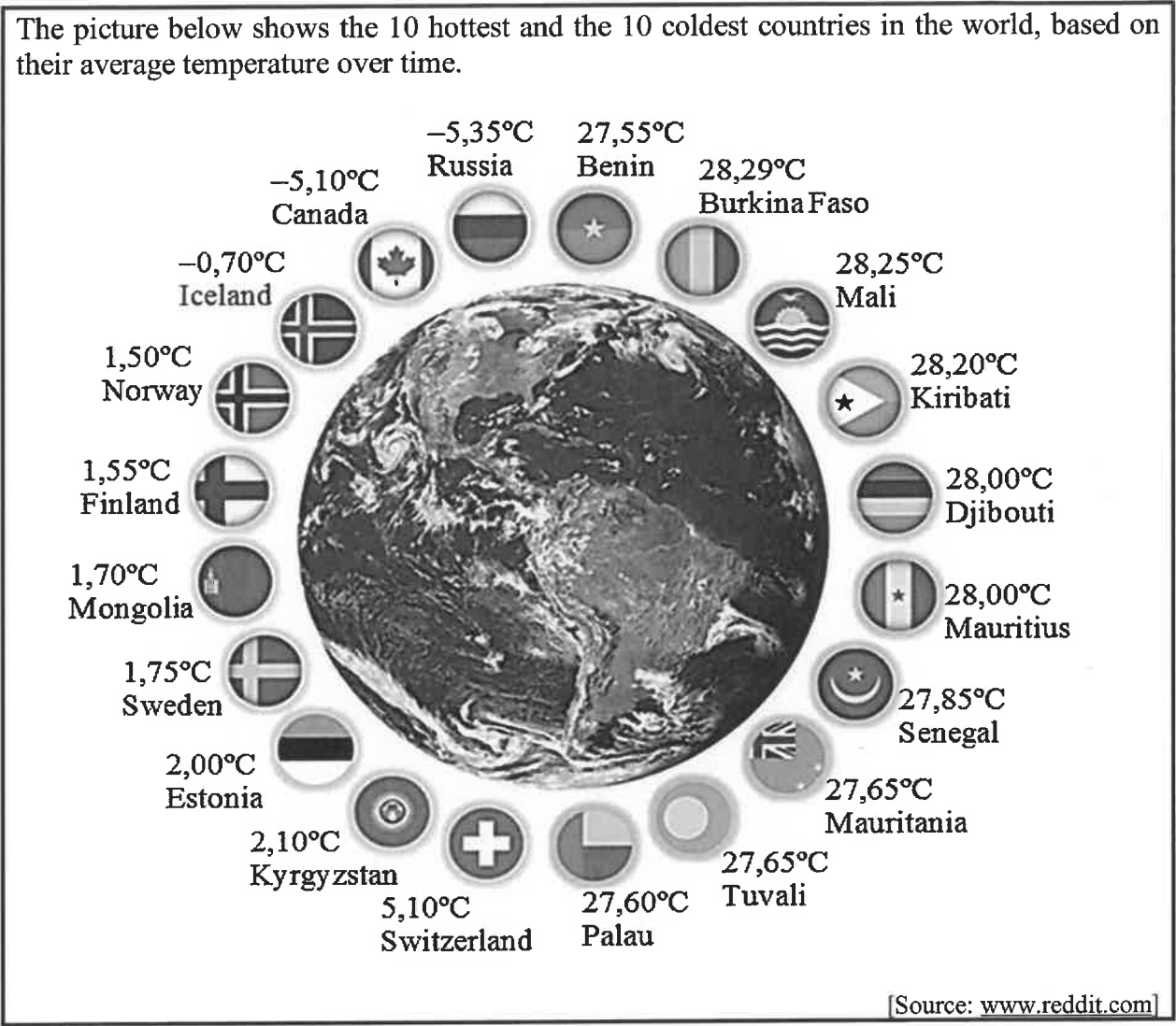
COLUMN A	COLUMN B
1.1.1 Ratio scale	A 1 000
1.1.2 Grams in one ton	B 1 000 000
1.1.3 Surface area of a cylinder	C 1 000 000 000
1.1.4 Floor plan	D plan that shows how items are arranged in a certain space
	E bar scale
	F $2 \times \pi \times \text{radius}^2 \times \text{height}$
	G plan that shows the layout of a building, as seen from above
	H $2 \times \pi \times \text{radius}^2 + 2 \times \pi \times \text{radius} \times \text{height}$
	I number scale

(4 x 2) (8)

1.2 In each of the statements below, choose the correct word(s) from those given in brackets to make the statement TRUE. Write only the word(s) next to the question numbers (1.2.1 to 1.2.4) in the ANSWER BOOK.

- 1.2.1 A probability is always (less than/greater than) or equal to one. (2)
- 1.2.2 When calculating the amount of medicine to administer to a toddler, we round (up/down) the decimal answer, in millilitres. (2)
- 1.2.3 A flow rate of 12,5 litres/hour is equal to 25 litres in (two/three) hours. (2)
- 1.2.4 An elevation plan of a building is a (2D/3D) representation of the building. (2)

1.3 The picture below shows the 10 hottest and the 10 coldest countries in the world, based on their average temperature over time.



Use the information above to answer the questions that follow.

- 1.3.1 Write down the average temperature in Sweden. (2)
- 1.3.2 Name the third hottest country. (2)
- 1.3.3 Round off Russia's average temperature to the nearest °C. (2)
- 1.3.4 Calculate the difference between the average temperatures of Senegal and Iceland. (3)
- 1.3.5 Write down the names of ALL the countries that have the exact same temperatures. (3)

[28]

QUESTION 2

- 2.1 ANNEXURE A in the ANSWER BOOK shows the layout plan of a supermarket with various labelled sections to assist customers. Clive went to this supermarket to do some shopping.

Use ANNEXURE A to answer the questions that follow.

- 2.1.1 Clive followed the directions below to buy an item from this supermarket.

- Enter the supermarket and immediately turn right.
- Walk past the magazine section and then turn left.
- Continue straight ahead until you come to the end of the aisle.
- The item will be in the section on your right.

Name the type of product Clive bought. (2)

- 2.1.2 Describe the location of the pet care section. (2)

- 2.1.3 Name the section where you will find milk and yoghurt. (2)

- 2.1.4 Choose the correct word from those given in brackets to make the following statement TRUE:

The customer flow of the supermarket, as displayed in the layout plan, is (clockwise/anti-clockwise). (2)

- 2.1.5 Give ONE positive impact that a properly labelled section and an attractive set-up in a supermarket will have on a customer. (2)

- 2.1.6 Give ONE possible reason why the cool drinks, butchery, dairy and cheese sections are located against the back wall of the supermarket. (2)

- 2.1.7 Give a possible name for the symbol  in the layout plan. (2)

2.2 For his Mathematical Literacy project, Clive needed to record the gender of customers, and the most popular colour of outfits customers wore as they entered the supermarket. He recorded the gender of the customers and the colours of the outfits in TABLE 2 below. (NOTE: Some values have been omitted.)

TABLE 2: GENDER OF CUSTOMERS AND COLOUR OF OUTFIT

	BLACK	RED	BLUE	GREEN	BROWN	YELLOW	TOTAL
Female	a	31	10	16	9	4	c
Male	25	7	b	13	9	2	68
TOTAL	43	38	22	29	18	6	d

Use TABLE 2 above to answer the questions that follow.

2.2.1 Calculate the missing values a, b, c and d. (4)

2.2.2 Determine the probability of randomly selecting a female from the people wearing green outfits. (2)

2.2.3 Clive wrote down the following probability as a possible outcome:

$$P(\text{outcome}) = \frac{25}{68}$$

Give the gender and the colour of the outfit represented by this probability. (3)
[23]

QUESTION 3

3.1

A garden landscaper is helping Mrs Mbele to plan a garden behind her house. There will be paving bricks laid between the house and the garden. The front of the garden will have the house as one of its boundaries, while the rest of the outer boundaries of the garden will have wire fencing.

ANNEXURE B in the ANSWER BOOK shows the plan for the proposed garden and its features.

Use ANNEXURE B and the information above to answer the questions that follow.

3.1.1

Calculate the total length of the wire fencing needed to fence the outer boundaries of the garden, including the paved area.

(3)

3.1.2

The circular fishpond (A) has a diameter of 120 cm and a depth of 0,5 m.

(a)

Calculate, in cm³, the volume of the fishpond.

Use the formula:

Volume of the cylinder = 3,142 × radius² × depth

(4)

(b)

Surrounding the circumference of the fishpond is a row of paving bricks. Each paving brick is 20 cm long.

Determine the circumference of the paved outer edging of the fishpond.

Use the formula:

Circumference of a circle = 3,142 × diameter

(3)

3.1.3

The rectangular paved area (C on the plan) between the garden and the house is 36,16 m².

(a)

Calculate the width of the paved area between the garden and the house.

Use the formula:

Area of a rectangle = length × width

(4)

(b)

118 wheelbarrows of gravel are needed for 10 m³ of gravel.

Thabang stated that more than 65 wheelbarrows of gravel are needed to place a 150 mm layer of gravel under the paved area.

Verify, with calculations, whether his statement is VALID.

Use the formula:

Volume of rectangular prism = Area of rectangle × depth

(6)

3.2

The paved seating area (**B** on the plan), alongside, is located at the eastern side of the garden. This area has a circular paving brick in the middle, surrounded by custom-made pavers (irregularly shaped paving bricks) to form the circular paved seating area.

The custom-made pavers are sold in packs of 13, which covers exactly a quarter of the full circular seating area, excluding the middle paver.

The cost of the pavers, excluding 15% VAT, are shown in TABLE 3 below.

Picture of the layout of the circular paved area (**B** on the plan)

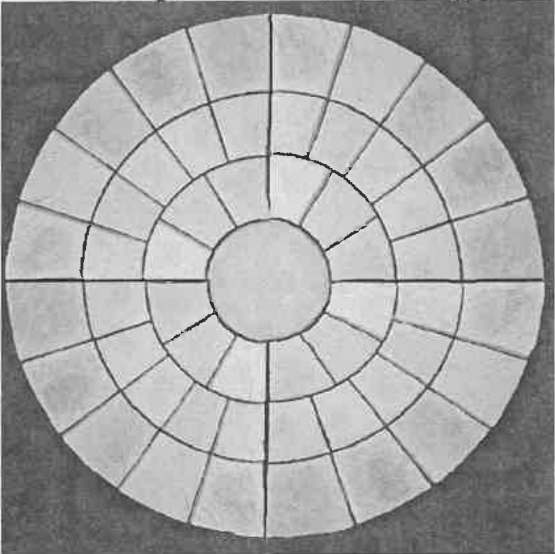


TABLE 3: COST OF PAVERS, EXCLUDING 15% VAT

MATERIALS	COST
Middle paver	R125,80
Pack of 13 custom-made pavers	R657,40
Other materials	R1 250,00

Use the information above to answer the questions that follow.

- 3.2.1 Determine the total number of paving bricks in the first row, closest to the middle circular paver. (2)
- 3.2.2 Calculate the total cost, including VAT, of the materials required to pave the entire seating area **B**. (5)

[27]

QUESTION 4

- 4.1 Nikita wants to open her own pet shop.
The operating hours of the pet shop are given in TABLE 4 below.

TABLE 4: OPERATING HOURS OF THE PET SHOP

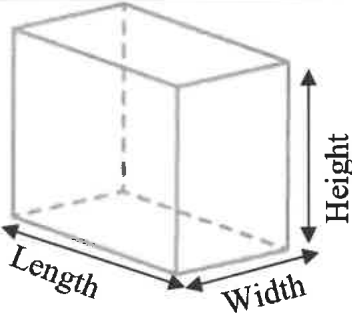
DAYS OF THE WEEK	OPERATING HOURS
Monday to Friday	07:30 to 17:00
Saturday	08:00 to 13:00
Sunday	Closed

Nikita will sell fish tanks in the shape of mini aquarium blocks, as shown in the pictures and diagram below.

DIAGRAM AND PICTURES OF THE MINI AQUARIUM BLOCK TANKS







Inner length = 11,6 cm
Inner width = 7,6 cm
Inner height = 10,5 cm
NOTE: 1 cm³ = 1 ml

[Adapted from www.aliexpress.com]

Use the information above to answer the questions that follow.

- 4.1.1

Determine (in simplified form) the ratio of the length to the width of the mini aquarium block tank.

(3)
- 4.1.2

Calculate the total number of hours the pet shop will be open in one operating week.

(5)
- 4.1.3

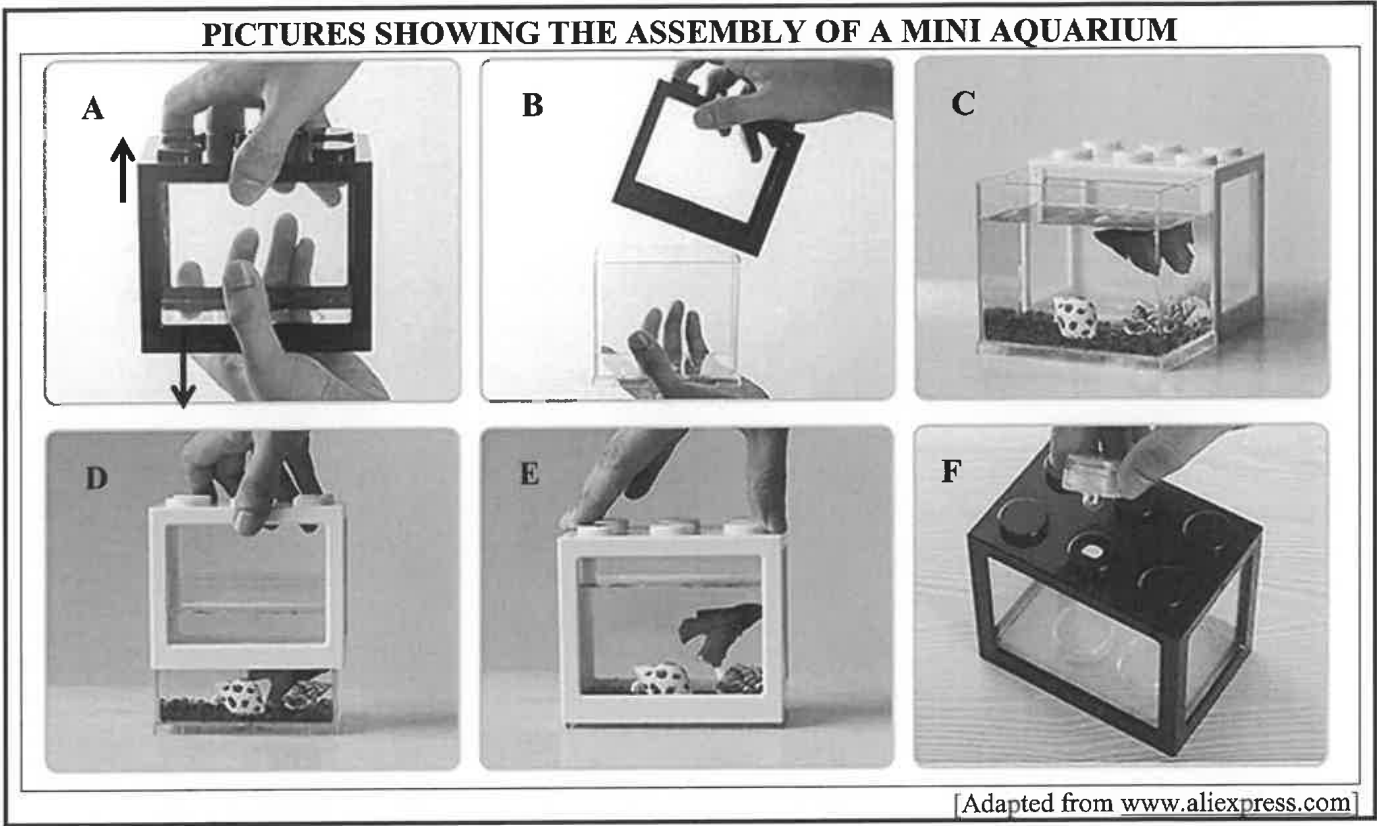
Each mini aquarium tank will contain 75% of its capacity in water.
- Determine the amount of water left over in a jug (1 000 ml), after filling one mini aquarium tank with water.
- Use the formula: **Volume = length × width × height**

(7)

4.2 Nikita received the different pieces for assembling the mini aquarium tank.

The pictures below show the different steps required to assemble one mini aquarium.

You may assume that the colours of the frames of the tank are the same in all the pictures below.



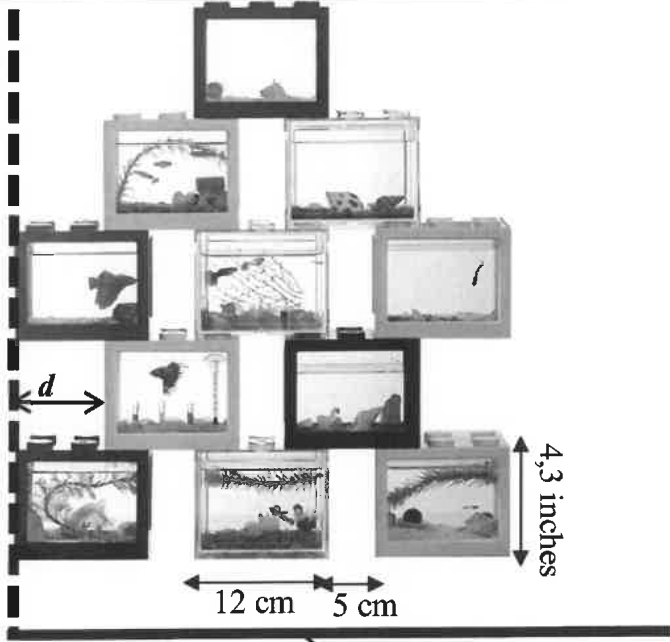
Choose a picture above that will match a written instruction below. Write down only the letter (A, B, C, D, E or F) of the picture next to the question number, e.g. 4.2.7 H.

- | | | | |
|-------|---|--------|-----|
| 4.2.1 | Place the outer frame over the transparent inner to cover it. | | |
| 4.2.2 | Pull in opposite directions to open the mini aquarium. | | |
| 4.2.3 | The hole is for feeding or to put in a light. | | |
| 4.2.4 | One hand will hold the transparent inner tank while the other hand will hold the outer frame. | | |
| 4.2.5 | Add water and decorating items as you like. | | |
| 4.2.6 | Close tightly by pressing down on the outer frame. | (6 ×1) | (6) |

4.3 Nikita decided to assemble a few of the mini aquariums and mount them against the wall at the front desk.

There is a 5 cm space between each mini aquarium tank along the length of the wall.

In every odd row, the mini aquarium tanks start and end against the wall. In the even rows, the mini aquarium tanks start at space *d* from the wall, on either side of the row. (See the pattern in the picture below.)

PICTURE OF PART OF THE MINI AQUARIUM TANK ARRANGEMENT AGAINST THE WALL	DIMENSIONS OF THE ASSEMBLED MINI AQUARIUM TANK
	Mini aquarium tank: Outer length = 12 cm Outer width = 8 cm Outer height = 4,3 inches
	DIMENSIONS OF THE WALL AT THE FRONT DESK
	Length = 199 cm Height = 100 cm

[Adapted from www.aliexpress.com]

NOTE: 1 mm = 0,0394 inches

Use the information above to answer the questions that follow.

- 4.3.1 Determine, in cm, the height of one mini aquarium tank. (4)
- 4.3.2 Calculate the total number of mini aquarium tanks Nikita will be able to place in the bottom row to maximise the space along the length of the wall. (7)
- 4.3.3 Nikita stated that length *d* is 8,5 cm.

Verify, showing ALL calculations, if her statement is VALID. (4)
[36]

QUESTION 5

5.1

The Las Vegas Grand Prix is a 50-lap car race. It takes place at the Las Vegas Strip track in Nevada, USA, annually.

ANNEXURE C in the ANSWER BOOK shows the layout of the Las Vegas track with the intended route. The temporary track is to be built within the streets of Las Vegas and it includes popular landmarks, labelled curves and corners.

TABLE 5 below summarises the details of the race.

TABLE 5: SUMMARY OF THE DETAILS OF THE RACE

TRACK INFORMATION			
• Number of laps:	50	• Lap length:	6,201 km
• Number of curves and corners:	17	• Race distance:	310,05 km
• Number of straights:	3	• Top speed:	212 mph

[Adapted from <https://www.flasvegasp.com/track-layout/>]

Use ANNEXURE C and TABLE 5 above to answer the questions that follow.

- 5.1.1 Identify the shop that a driver will find on his right-hand side at the 13th curve. (2)
- 5.1.2 State the general direction of the Fountains of Bellagio from the Wynn Golf Club. (2)
- 5.1.3 Show, by means of calculations, how the race distance of 310,05 km was determined. (2)
- 5.1.4 Name the road that will be crossed after taking the 4th curve. (2)
- 5.1.5 The scale of the track layout is 1 : 13 500.

One of the race car drivers maintained a constant speed of 204 km/h between points A and B, as indicated on the track layout.

Calculate, in minutes, the time it took this driver to cover the distance.

Use the formula:

Distance = speed × time

(7)

- 5.1.6 A race car driver decides to practise on the track late in the afternoon. He complained that the rays of the sun were affecting his vision after the 9th corner.

State, giving a reason, why you would agree or disagree with this race car driver. (3)

5.2 The fastest laps of the top five race car drivers are shown in TABLE 6 below.

TABLE 6: LAS VEGAS GRAND PRIX: FASTEST LAPS

	DRIVER	LAP	EXACT TIME OF DAY	LAP- TIME	AVERAGE SPEED (km/h)
1	Oscar Piastri	47	23:28:54	1:35,490	233,779
2	Max Verstappen	44	23:23:34	1:35,614	233,476
3	Charles Leclerc	50	23:33:15	1:35,669	233,342
4	Lewis Hamilton	48	23:30:22	1:35,716	233,227
5	Sergio Perez	40	23:17:12	1:35,939	232,685

[Source: www.formula1.com/en/results.html]

NOTE:
Lap time 1:35,490 = 1 minute 35,490 seconds

Study the information above to answer the questions that follow.

- 5.2.1

The exact time of day shows the time the driver finished his fastest lap.

Calculate, to TWO decimal places, at what time Oscar Piastri started lap 47.

(3)
- 5.2.2

Max Verstappen won the race with a time of 1 hour 29 minutes and 8,289 seconds.

One of the spectators said Max Verstappen took 5 348,289 seconds, with an average lap-time of 106 seconds, to complete the race.

Verify, showing ALL calculations, whether his statement is VALID.

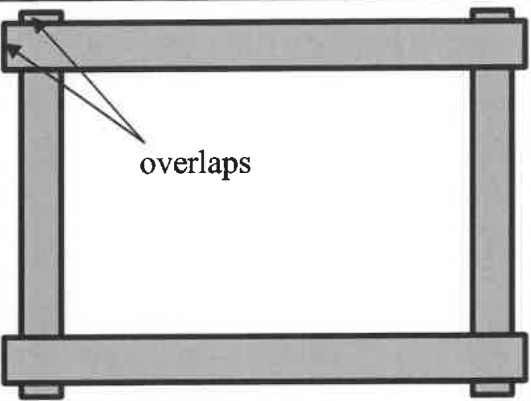
(6)

5.3

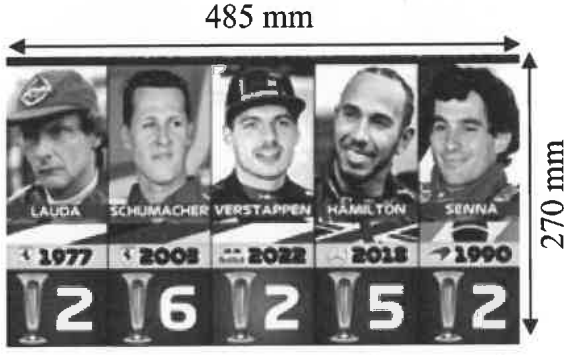
Thabiso is a Grand Prix fanatic and he wants to buy a framed poster of the Grand Prix world champions. The frame is made up of four pieces of wood joined together with overlaps, as seen in the picture and diagram below.

Dimensions of the frame:

- Long piece is 630 mm by 45 mm
- Short piece is 420 mm by 45 mm
- Overlap is 2,5 cm throughout

PICTURE OF THE FRAME	DIAGRAM OF THE FRAME
 [Source: istockphoto.com]	

POSTER OF GRAND PRIX WORLD CHAMPIONS



[Source: www.youtube.com]

Use the information above to answer the questions that follow.

- 5.3.1

The frame has two horizontal pieces of wood mounted across two vertical pieces of wood with overlaps. See the picture and diagram above.

Calculate, in mm, the inner length and the inner width of the frame.

(6)
- 5.3.2

The person responsible for placing the poster of the Grand Prix world champions inside the frame, stated that the poster will not fit exactly within the frame.

Verify, with calculations, whether his statement is VALID.

(3)
[36]

TOTAL: 150



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Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2024

MARKS: 150

TIME: 3 hours

This question paper consists of 13 pages and an addendum with 3 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:
 - ANNEXURE A for QUESTION 2.1
 - ANNEXURE B for QUESTION 2.2
 - ANNEXURE C for QUESTION 5
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 drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 TABLE 1 below contains a list of explanations and definitions of concepts used in Mathematical Literacy. ...

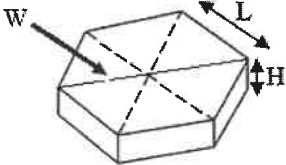
TABLE 1: EXPLANATIONS AND DEFINITIONS OF CONCEPTS

A	A measuring system using metres, litres and kilograms
B	The amount of space occupied by an object
C	A system measuring in inches, gallons and pounds
D	The amount of space available to hold something
E	The side of a building you see when you are facing south
F	The side of a building you see when you are facing north
G	The amount of space that is enclosed by the perimeter of an object

Use TABLE 1 above and match an explanation or a definition with EACH of the concepts below. Write only the letter (A–G) next to the question numbers (1.1.1 to 1.1.4), e.g. 1.1.5 H.

- 1.1.1 Capacity (2)
- 1.1.2 North elevation (2)
- 1.1.3 Imperial system (2)
- 1.1.4 Area (2)

1.2 Paving bricks are available in different shapes and sizes. Hexagonal paving bricks are made up of 6 equal triangles and will be used to cover a rectangular ground surface.

SKETCH OF A HEXAGONAL PAVING BRICK	DIMENSIONS OF THE PAVING BRICK	THREE BRICKS IN A ROW
	Equal side lengths (L) = 90 mm Height (H) = 50 mm Width (W) = 220 mm	

[Source: econbrick.co.za]

Use the information above to answer the questions that follow.

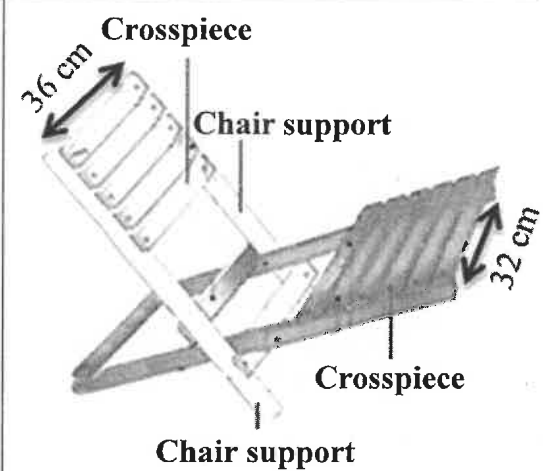
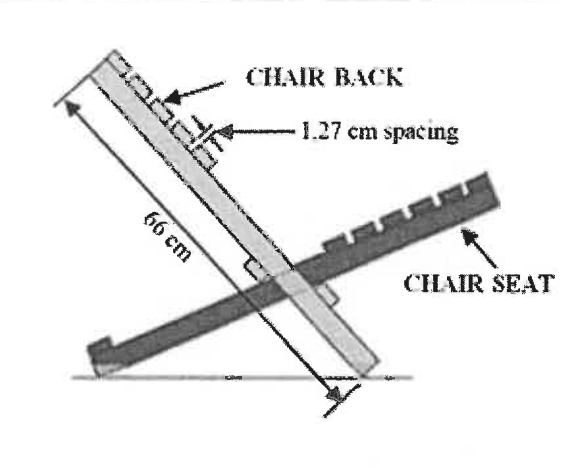
- 1.2.1 Convert 220 mm to metres. (2)
- 1.2.2 Choose, from the options (A, B or C) below, the correct one that could be used to calculate the volume of the hexagonal paving brick.

A Volume = 6 × area of triangle × height

B Volume = side length + height + width

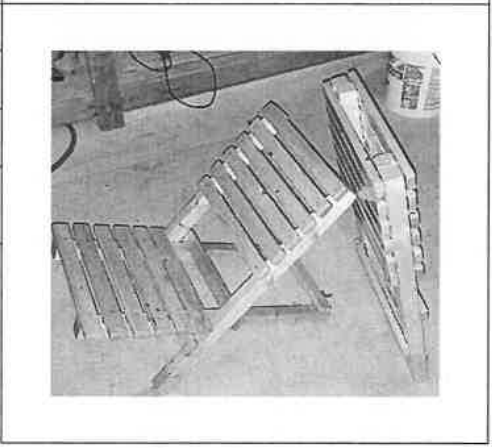
C Volume = 6 × perimeter × height (2)
- 1.2.3 Calculate the number of bricks needed for a single row along a length of 2 860 mm. (3)

1.3 The fold-up chair is a beach chair that folds into itself. A 3D sketch, a side view, a material list, the assembled chair and a folded-up chair are shown below.

3D SKETCH OF FOLD-UP CHAIR		SIDE VIEW OF FOLD-UP CHAIR
		
MATERIAL LIST		ASSEMBLED CHAIR AND FOLDED-UP CHAIR
#	Wooden Item	Dimensions (in cm)
4	Chair supports	1,9 × 3,8 × 66
13	Crosspieces	1,9 × 3,8 × 36
1	Seat back, bottom crosspiece	1,9 × 3,8 × 32

NOTE:

- The thickness of the wood is the smallest dimension.
- # is the number of item(s).



[Adapted from [instructables.com](https://www.instructables.com)]

Use the information above to answer the questions that follow.

- 1.3.1 Write down the total number of wooden items needed to assemble this chair. (2)
- 1.3.2 Determine the number of crosspieces found on the seats of THREE chairs. (3)
- 1.3.3 Name the item in the material list with the longest dimension. (2)
- 1.3.4 Identify which dimension of the chair support will represent the thickness of the wood. (2)
- 1.3.5 Write down, in millimetres, the length of the spacing between the crosspieces of the back of the chair. (2)
- [26]

QUESTION 2

- 2.1

John and five other family members decided to participate in the Baviaanskloof Leopard Trail Run. They decided to camp at the Baviaanskloof Uitspan camping site.

ANNEXURE A shows an aerial view of Baviaanskloof Uitspan with campsites and the number of campers allowed. Some campsites have one hut and others have more than one hut, labelled A, B and C.

Use ANNEXURE A and the information above to answer the questions that follow.

- 2.1.1

Explain what is meant by *aerial view*.

(2)
- 2.1.2

Calculate the maximum number of campers that can be accommodated at Baviaanskloof Uitspan camping site.

(3)
- 2.1.3

Determine the general direction of the dam from campsite 8.

(2)
- 2.1.4

The description below is found on their website:

'This campsite is situated near the dam and can accommodate a maximum of 19 campers.'

Write down which campsite is being described. Write down only the number of the campsite.

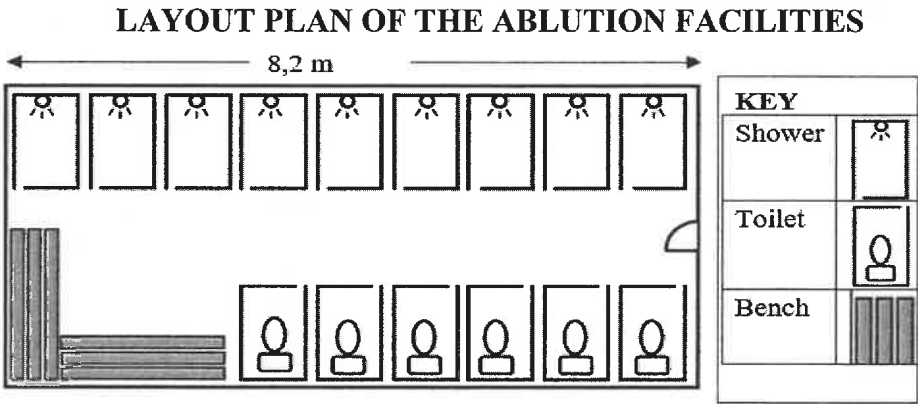
(2)
- 2.1.5

Calculate, as a percentage, the probability of John and his family randomly selecting a hut that can exactly accommodate the whole family.

(3)
- 2.1.6

The layout plan below shows the ablution facilities (toilets and showers) in the middle of campsites 3, 4, 5 and 6.

The actual length of the ablution facilities is 8,2 metres.



- Use the information above to answer the questions that follow.
- (a) Write down the total number of showers.

(2)
- (b) Determine, rounded to the nearest whole number, the scale of the plan.

(4)
- (c) Give ONE suitable reason why benches are found in the ablution facilities.

(2)

2.2

The Leopard Trail Run is a two-day event, run on the outskirts of the camp, starting and ending at the Cedar Falls Home Base.

ANNEXURE B shows the map as well as the elevation map of the Leopard Trail Run in the Baviaanskloof situated close to Willowmore.

Visitors to the Baviaanskloof can also do a four-day hike, starting at the Cedar Falls Home Base.

NOTE:

- Day 1 of the trail run is Days 3 and 4 of the hike.
- Day 2 of the trail run is Days 1 and 2 of the hike.
- Trail (path through the natural landscape)

[Adapted from gobaviaans.co.za]

Use ANNEXURE B and the information above to answer the questions that follow.

2.2.1 Write down the day during the run when you would pass Gabriel's Pools. (2)

2.2.2 The descriptions of a part of the route on the brochure are as follows:

- Run for 5,5 km along Rhebok Valley.
- Continue down the other side to the Reflection Pools for a swim and drinking water.
- Then return to the home base.

Choose the route described above and match it with **A, B, C** or **D**. Write only the letter next to the question number (2.2.2).

- A Leopard Trail Run – Day 1 (Part 1)
- B Leopard Trail Run – Day 1 (Part 2)
- C Leopard Trail Run – Day 2 (Part 1)
- D Leopard Trail Run – Day 2 (Part 2) (2)

2.2.3 Determine the number of kilometres John had run when he reached the highest point above sea level on Day 2. (2)

2.2.4 John's best average speed (in km/h) for the run was his average speed from the 8 km mark up to the 18 km mark on Day 1.

Use the elevation map to explain why this was the case. (2)

2.2.5 John stated that on Day 2, while he was running from the 17,5 km mark to the end of the trail, he had moved more than 100 metres closer to sea level.

Show, by means of calculations, whether or not he is correct. (3)
[31]

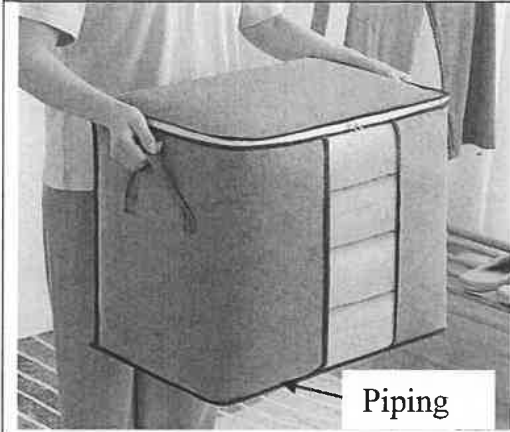
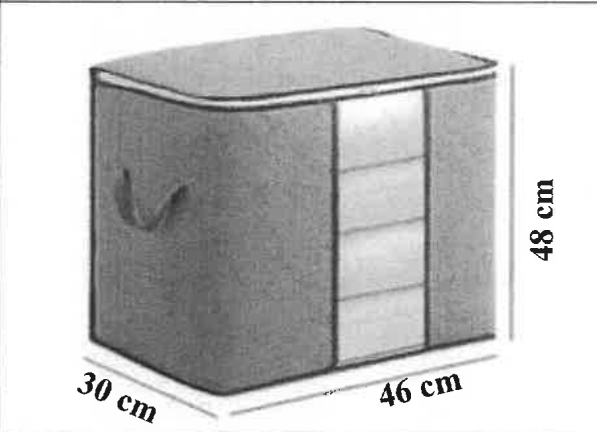
QUESTION 3

3.1

Mrs Kgomo is a Grade 2 teacher at Happy Valley Primary School.

She has a reading corner at the back of her classroom. Learners who wait for their transport after school, usually sit there and read a book.

Mrs Kgomo stores pillows in bags (see pictures below). Learners sit on these pillows after school.

PILLOWS IN THE BAG	DIMENSIONS OF THE BAG
 Piping	

NOTE: Piping: thin cord covered in fabric used to decorate the bag and reinforce the seams

[Adapted from www.shein.com]

Use the information above to answer the questions that follow.

- 3.1.1

The school day ends at 12:55.

Tendani's father was late and only came to fetch him at 14:13.

Determine how long Tendani sat in the reading corner.

(2)
- 3.1.2

The height of one pillow is 11 cm.

Determine the difference between the total height of the pillows in ONE bag and the height of the bag.

(4)
- 3.1.3

The piping around the bottom edge of some of the bags for the pillows needs to be replaced. The store sells the piping in half-metre lengths.

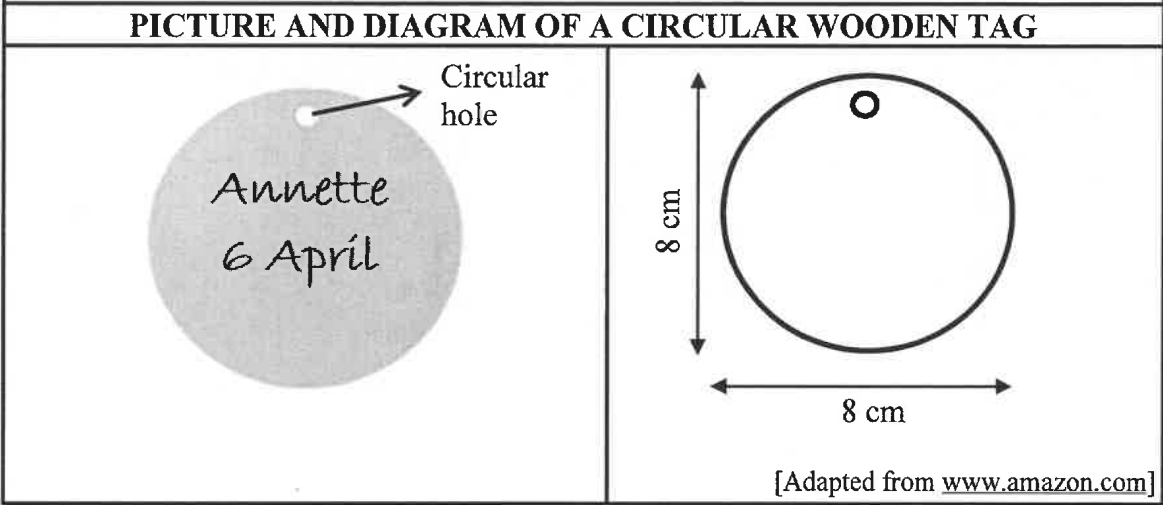
Calculate the total length of piping she will have to purchase to replace the piping around the bottom edges of FOUR bags.

You may use the following formula:

Perimeter = 2 (length + width)

(5)

- 3.2 Mrs Kgomo created a birthday calendar for her 2024 class to hang against the wall.
- She will write each learner's name and birthday on a small circular wooden tag and attach the tag to the correct month.
- The circular wooden tag has a circular hole to attach a ring that is used to hang the tag. The area of the circular hole is $0,3142\text{ cm}^2$.
- Every year she paints the front surface area of the circular wooden tags.
- The spread rate of the paint is $6\text{ m}^2/\ell$.

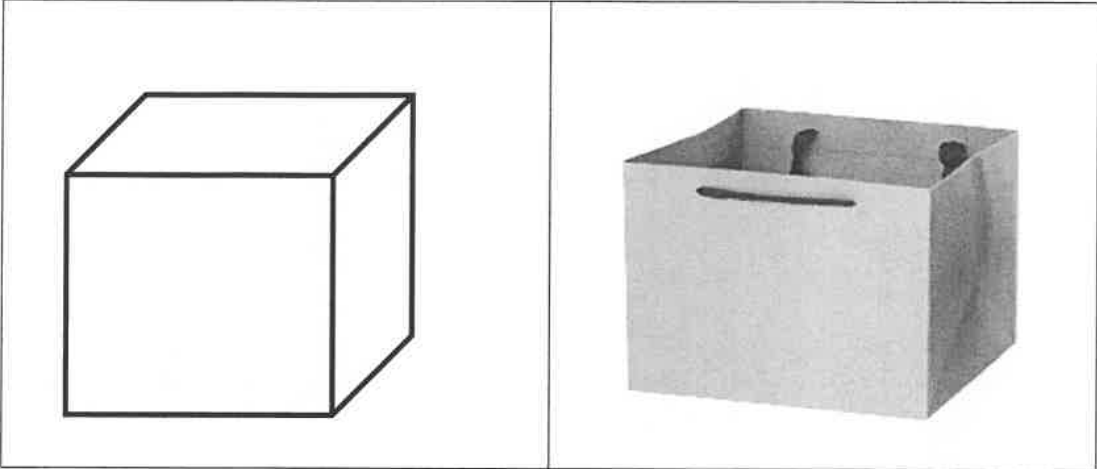


Use the information above to answer the questions that follow.

- 3.2.1 Determine, in cm, the circumference of the circular wooden tag.
- You may use the following formula:
- Circumference of a circle = $3,142 \times \text{diameter}$** (2)
- 3.2.2 Determine, in cm, the radius of ONE circular wooden tag. (2)
- 3.2.3 The hardware store sells paint in 50 ml, 1 litre, 5 litre and 20 litre containers.
- Mrs Kgomo claims that a 50 ml can of paint will be sufficient to paint ONE side of 36 circular wooden tags.
- Verify her statement. Show ALL calculations.
- Use the following formula:
- Area of a circle = $3,142 \times \text{radius}^2$** (9)

3.3 On each learner's birthday, the learner receives a cubic-shaped packet of homemade sweets, as shown in the diagram and picture below.

DIAGRAM AND PICTURE OF A CUBE AND A CUBIC-SHAPED PACKET



[Adapted from www.pinterest.com]

Use the diagram above to answer the questions that follow.

3.3.1 The volume of the cubic-shaped packet is 2 744 cm³.

Calculate the side length of the cubic-shaped packet.

You may use the following formula:

Volume of a cube = side × side × side (4)

3.3.2 There are 35 different coloured sweets in each packet.

TABLE 2 below shows the number of sweets per colour.

TABLE 2: NUMBER OF SWEETS PER COLOUR	
COLOUR OF SWEETS	NUMBER OF SWEETS
Blue	4
Purple	5
Pink	8
Orange	11
Yellow	7

Determine the probability, as a decimal, of randomly choosing a pink or a yellow sweet from the packet.

(3)
[31]

QUESTION 4

4.1 Crude oil is heated in a vertical, cylindrical tower to separate and extract products, such as petroleum gas, gasoline (petrol), kerosene (lamp oil), diesel, industrial oil, and paraffin wax, which boil at different temperatures.

CYLINDRICAL TOWER SHOWING DIFFERENT PRODUCTS AND THEIR BOILING TEMPERATURES

The diagram shows a vertical cylindrical tower with a furnace at the bottom. A coil of pipes is inside the furnace, leading up to the tower. The tower has several horizontal pipes (extractor pipes) at different heights. The temperatures at these levels are: 20 °C (Petroleum gas), 150 °C (Gasoline (petrol)), 200 °C (Kerosene (lamp oil)), 300 °C (Diesel), 370 °C (Industrial oil), and 400 °C (Paraffin wax). The furnace is labeled 'Furnace' and the bottom product is 'Paraffin wax'.

DIAGRAM OF A VERTICAL, CYLINDRICAL TOWER

The diagram shows a vertical cylindrical tower with a diameter of 6 m and a height of 54 m. The tower is divided into three sections: A (top), B (middle), and C (bottom). The diameter is labeled as 6 m and the height as 54 m.

[Adapted from <http://derivfx.com>]

NOTE:

- Extraction occurs because different liquids have different boiling points.
- Extraction takes place in a large, vertical, cylindrical tower with a diameter of 6 m.
- The total surface area of sections (A + C) = 150,816 m².

Use the information above to answer the questions that follow.

- 4.1.1

Identify the crude oil product that will be third to boil.

(2)
- 4.1.2

Write down the product extracted at 150 °C.

(2)
- 4.1.3

Convert the boiling point of diesel to degrees Fahrenheit.
Use the formula: $^{\circ}\text{C} = \frac{(^{\circ}\text{F} - 32)}{1,8}$

(4)
- 4.1.4

The pipes leading in and out of the vertical, cylindrical tower take up 2,5% of the surface area of part B of the cylindrical tower.

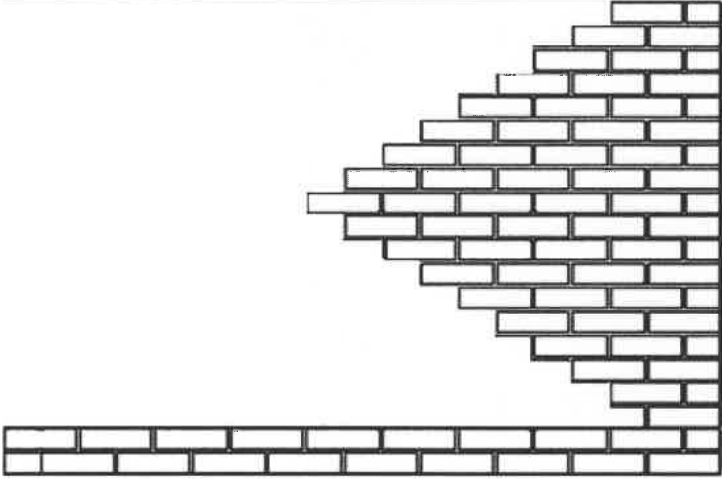
Calculate the total surface area of the vertical, cylindrical tower, excluding the area taken up by the pipes.

Use the formula:

Surface area of an open cylinder = 3,142 × diameter × height

(7)

4.2 A worker at the oil refinery intends converting her double-door garage into a bigger living room by building double-bricked walls to replace both of the doors.

PICTURE OF TWO DOORS TO BE REPLACED	BRICKS ON A WOODEN PALLET
	
INCOMPLETE DIAGRAM SHOWING THE PATTERN OF HOW THE BRICKS SHOULD BE LAID, WITH THE FIRST TWO ROWS COMPLETED	SIDE VIEW OF THE DOUBLE-BRICK WALL
	

- NOTE:**
- 525 bricks per pallet at a price of R6,45 per brick. Bricks are sold per pallet.
 - Half bricks are thrown away (not re-used).

Use the information above to answer the questions that follow.

4.2.1 Determine the total number of pallets of bricks needed to replace both garage doors. (5)

4.2.2 The opening of a garage door has dimensions of 2,13 m × 3 m.

Other costs to build the double-brick wall:

- Material, other than bricks, cost R2 000,00
- Labour is R500,00 per square metre

The owner states that the total cost to replace both garage doors with walls would be R15 200,00.

Verify her statement by means of calculations.

You may use the following formula: **Area = length × width** (7)

4.2.3 Give ONE suitable reason why the bricks have to be placed on a wooden pallet. (2)

[29]

QUESTION 5

- 5.1
- Chris and Boipelo are planning a year-long trip, mostly along the A1 motorway, around Australia. It is the world's longest continuous road of 14 655 km that passes through every state and connects seven of its eight capitals.

ANNEXURE C is a map of Australia and the distances and driving times between the major cities and the states or territories. Next to it is the plan of their trip.

Use ANNEXURE C and the information above to answer the questions that follow.

- 5.1.1
- Write down the names of the cities where the distance between them is 738 km.
- (2)
- 5.1.2
- Name the FOUR months when Chris and Boipelo will be in Western Australia.
- (3)
- 5.1.3
- Determine the distance from Perth to Adelaide.
- (3)
- 5.1.4
- Name the state where they plan to be during February.
- (2)
- 5.1.5
- Calculate the average speed, in km/h, from Brisbane to Cairns.

You may use the following formula: **Distance = speed × time** (4)

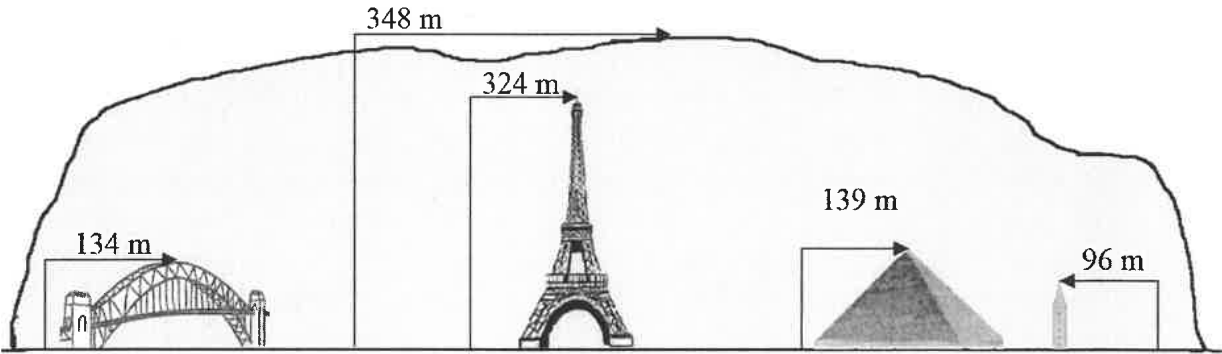
5.2

Chris and Boipelo plan to visit Uluru. This oval-shaped big rock rises 1 142 feet above the surrounding desert plain. A picture of Uluru is shown alongside.

Picture of Uluru



The diagram below shows a comparison of the height of Uluru and some other tourist attractions around the world.



Attraction	Height (m)
Uluru	348
The Eiffel Tower	324
Sydney Harbour Bridge	134
The Great Pyramid of Giza	139
Big Ben	96

[Sources: [Pinterest.com.au](https://www.pinterest.com.au) and [Britannica.com](https://www.britannica.com)]

Use the information above to answer the questions that follow.

- 5.2.1
- Determine, rounded to THREE decimal places, the conversion factor from feet to metres used in this diagram, in the form 1 foot = ... m.
- (3)
- 5.2.2
- Write, as a simplified ratio, the heights of Uluru : Eiffel Tower : Big Ben.
- (4)

5.3 In addition to the mainland, Australia is surrounded by many thousands of small islands. Boipelo found TABLE 3 indicating the areas for the mainland, islands and total for each state or territory on a website. Some values have been omitted.

TABLE 3: AREA SIZES OF THE MAINLAND, ISLANDS AND TOTAL FOR EACH STATE OR TERRITORY

STATE/TERRITORY	MAINLAND AREA km ²	ISLAND AREA km ²	TOTAL AREA km ²	PERCENTAGE OF TOTAL AREA
Western Australia	2 526 924	3 089	2 527 013	32,9
Queensland	1 723 030	6 712	1 729 742	22,5
Northern Territory	1 334 404	13 387	1 347 791	17,5
South Australia	979 651	4 670	984 321	12,8
New South Wales	801 137	13	801 150	10,4
Victoria	227 038	406	227 444	3,0
Tasmania	64 519	3 882	68 401	0,9
Australian Capital Territory	2 358	—	2 358	—
TOTAL (AUSTRALIA)	7 656 061	32 159	7 688 220	...

NOTE: Territory – a big area that compares to a district or province

[Source: ga.gov.au]

Use TABLE 3 and refer to ANNEXURE C to answer the questions that follow.

- 5.3.1 A meteorite (rock from the sky) fell somewhere in Australia.

Write down the probability that it randomly fell in Queensland. (2)
- 5.3.2 Show, with calculations, why it could be stated that the total area of the islands of Australia is approximately half of the area of the mainland area of Tasmania. (3)
- 5.3.3 The Australian Capital Territory has a population of 454 499.

(a) Determine, rounded to the nearest whole number, the population density of the Australian Capital Territory as people per square km. (3)

(b) Give a suitable reason, with calculations, why this area is omitted from the percentage calculation in the table. (4)

[33]

TOTAL: 150



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

MAY/JUNE 2024

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages an addendum with 6 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES in the ADDENDUM to answer the following questions:
 - ANNEXURE A for QUESTION 2.1
 - ANNEXURE B for QUESTION 2.2
 - ANNEXURE C for QUESTION 3.2
 - ANNEXURE D for QUESTION 4.1
 - ANNEXURE E for QUESTION 4.2
 - ANNEXURE F for QUESTION 5.1
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 drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 TABLE 1 below shows a list of explanations and definitions in COLUMN B, and mathematical terms and concepts in COLUMN A.

TABLE 1: TERMS AND CONCEPTS WITH EXPLANATIONS AND DEFINITIONS

COLUMN A	COLUMN B
1.1.1 Circumference	A time measurement equivalent to six hundred seconds
1.1.2 Probability	B the measuring of hotness or coldness
1.1.3 One hour	C the line from one end of a circle to the other end
1.1.4 Temperature	D equivalent to the mass of a person divided by the height squared
	E the boundary that surrounds a circular shape
	F time measurement equivalent to three thousand six hundred seconds
	G the likelihood that something might happen
	H a number showing the relationship between the distance on a map and the actual distance

Use TABLE 1 above and choose an explanation or definition from COLUMN B that matches the term or concept in COLUMN A. Write only the letter (A–H) next to the question numbers (1.1.1 to 1.1.4) in the ANSWER BOOK, e.g. 1.1.5 J. (8 x 1) (8)

1.2 The three sketches below represent the same portion of the physical world which is drawn using three different scales (A, B and C) in random order.

Sketch 1	Sketch 2	Sketch 3

The following scales (in random order) were used to draw these sketches:

A 1 : 100 000
B 1 : 25 000
C 1 : 50 000

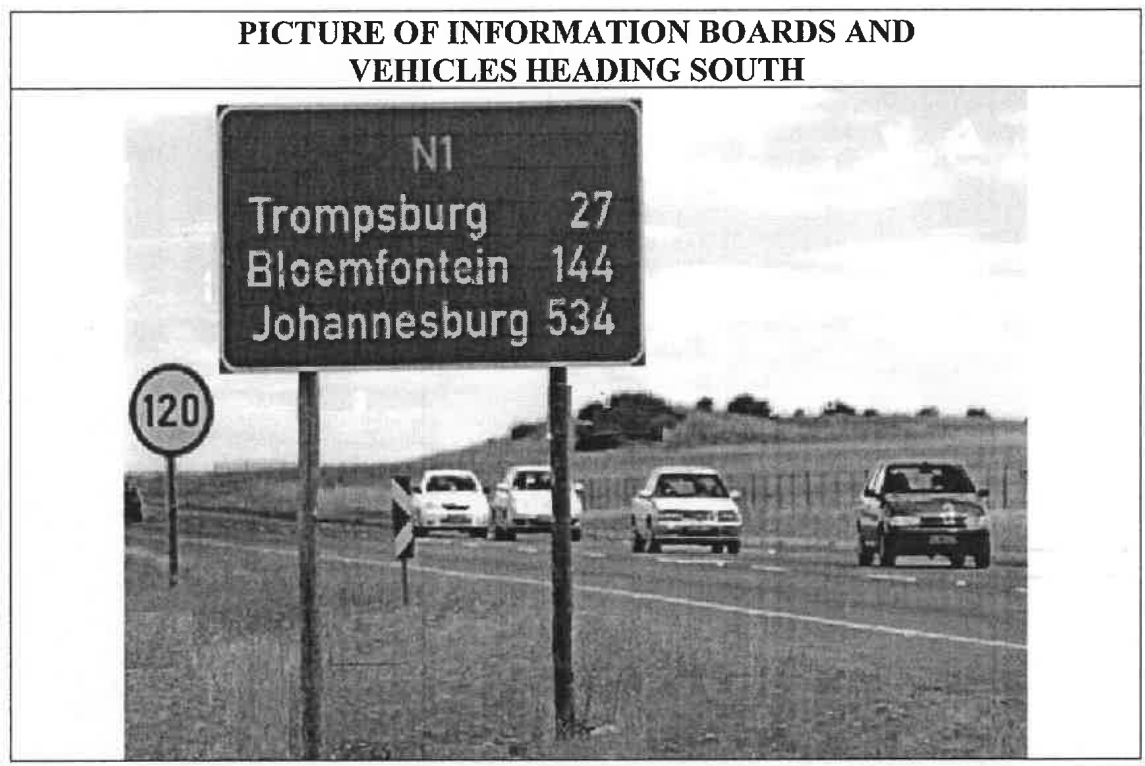
Use the information and sketches above to answer the questions that follow.

- 1.2.1 Name the type of scale used to draw the sketches above. (2)
- 1.2.2 Interpret the scale 1 : 50 000. (2)
- 1.2.3 Write down the scale that was used to draw Sketch 2. (2)

1.3

The picture below shows information boards (a traffic sign and distance information) and vehicles heading in a southerly direction.

The numbers displayed next to the names of the towns on the information board show the distance in kilometres from the information board to that town.



Use the information above to answer the questions that follow.

1.3.1 Give the shapes of the information boards. (2)

1.3.2 Write down the distance a motorist must still travel, in a northerly direction, to reach Bloemfontein. (2)

1.3.3 The 120 on the traffic sign board indicates 120 km/h.

Interpret 120 km/h in context. (2)

1.3.4 Determine the distance from Trompsburg to Johannesburg. (2)

1.3.5 State the general direction of Trompsburg from the information sign. (2)

1.3.6 The length of one of the road signs is 90 cm.

Convert this length to metres. (2)

[26]

QUESTION 2

2.1

ANNEXURE A shows the site map of the Bloem Agricultural Show and the entrance gates to the showgrounds.

The main exhibition halls are named Protea, Daisy, Tulip and Lily.

The Daisy Hall has a length of 65 m.

Use ANNEXURE A and the information above to answer the questions that follow.

- 2.1.1 Write down the gate number for the main public entrance. (2)
- 2.1.2 State the maximum number of public parking areas available. (2)
- 2.1.3 Determine the number of gates used by vehicles. (2)
- 2.1.4 Write down only the letter that makes the following statement TRUE:

 The probability of finding a gate on the eastern side of the site is ...

 A impossible.
 B an even chance.
 C certain. (2)
- 2.1.5 Give the general direction of Gate 12 from the Amusement Park. (2)
- 2.1.6 A layout plan will be drawn of this site map using a scale of 1 : 8 000.

 Determine, rounded to the nearest mm, the length of the Daisy Hall on
 this layout plan. (4)

2.2

One of the exhibitors sells pedal go-karts for kids (see picture alongside), which requires parts to be assembled in order to ride the pedal go-kart.

ANNEXURE B shows assembly instructions arranged in two columns. In COLUMN A are written instructions arranged in order and in COLUMN B are visual instructions (pictures), not arranged in any specific order.

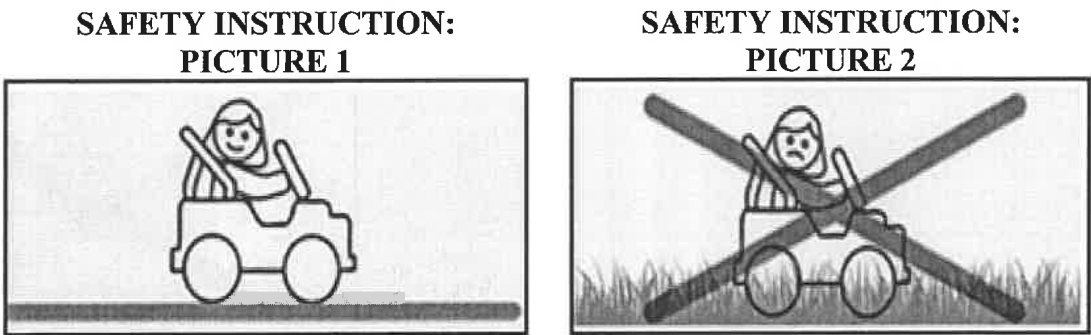
PICTURE OF A COMPLETED PEDAL GO-KART FOR KIDS



Use ANNEXURE B and the information above to answer the question that follows.

Choose a picture from COLUMN B that matches the written instruction in COLUMN A. Write only the letter (A–E) next to the question numbers (2.2.1 to 2.2.5), e.g. 2.2.6 F. (5 x 1) (5)

2.3 The pictures below illustrate safety instructions for using the pedal go-kart.



Write down an explanation for ONE of the safety instructions illustrated in the pictures above. (2)

2.4 TABLE 2 below shows the number of horses, small livestock and cattle from the Free State, Gauteng and other provinces on display at the Bloem Agricultural Show. One value (X) has been omitted.

TABLE 2: THE NUMBER OF HORSES, SMALL LIVESTOCK AND CATTLE ON DISPLAY FROM VARIOUS PROVINCES

PROVINCES	HORSES	SMALL LIVESTOCK	CATTLE	TOTAL
Free State	612	1 476	363	2 451
Gauteng	163	X	62	565
Other	585	1 024	371	1 980
TOTAL	1 360	2 840	796	4 996

[Adapted from Bloemshow/factsheet.pdf]

Use TABLE 2 to answer the questions that follow.

2.4.1 Determine missing value X. (2)

2.4.2 Write down, in simplified fractional form, the probability of NOT randomly selecting a horse from the total number of animals shown in TABLE 2 above. (3)

2.4.3 A farmer visits the display where all the cattle are kept. He is specifically interested in purchasing cattle from the Free State.

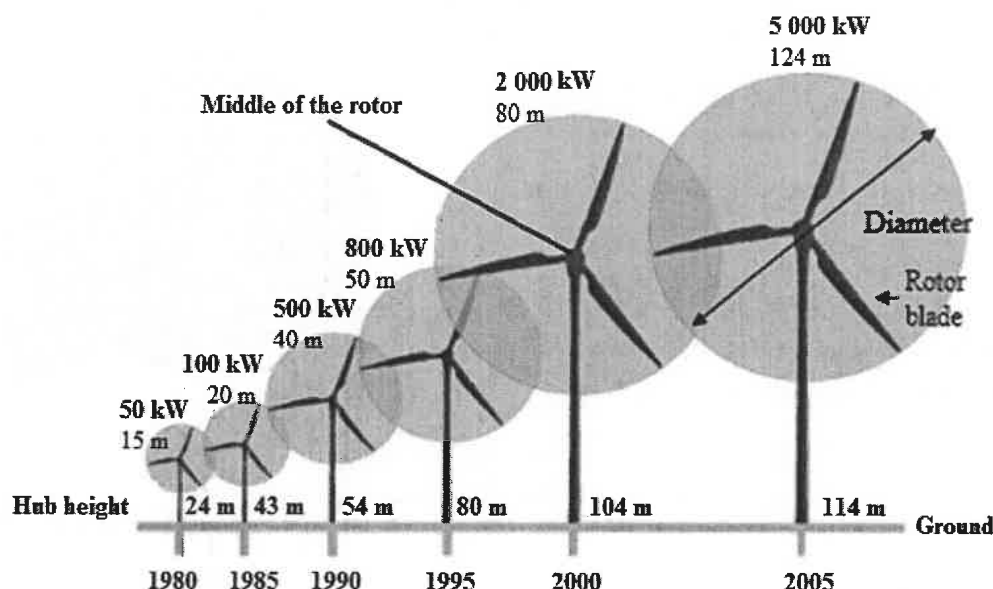
Calculate, as a percentage, the probability of the farmer randomly selecting cattle from the Free State. (3)
[29]

QUESTION 3

3.1 Wind turbines are used as an alternative way to generate electricity.

The picture below shows how the size of the wind turbine and the generation capacity has changed from 1980 to 2005.

**PICTURES OF WIND TURBINES AND GENERATION CAPACITY
USED FROM 1980 to 2005**

**NOTE:**

Hub height = distance from the ground to the middle of the wind turbine's rotor

5 000 kW: Power generation of 5 000 kilowatt

124 m: Diameter of the circle made by the rotor blades of the wind turbine = 124 m

Area of a circle = $3,142 \times \text{radius}^2$

Use the information above to answer the questions that follow.

- 3.1.1 Write down the amount of power generated by the wind turbine with the second-tallest hub height. (2)
- 3.1.2 Give ONE possible reason why the rotor blade size of the wind turbine from 2005 is larger than the rotor blade size of the wind turbine from 1980. (2)
- 3.1.3 Calculate, in metres, the maximum height that the tip of the rotor blade of the tallest wind turbine can reach as it turns. (3)
- 3.1.4 Anam says that the area covered by the rotor blade of the tallest wind turbine in motion is 12 077,748 m².
Verify, with calculations, whether or not her statement is VALID. (4)
- 3.1.5 Determine the percentage increase in power generation from 1995 to 2005. (4)
- 3.1.6 Give ONE other possible source of generating electricity that can be used in South Africa. (2)

3.2

A completed rectangular-based compost box is made up of three sections sharing some common panel boards. The sections are assembled by slotting panel boards into panel posts.

ANNEXURE C shows a rectangular compost box linking sections A, B and C with some common panel boards.

Some dimensions of the compost box are also shown.

You may use the following formulae, where applicable:

Perimeter of a rectangle = $2 \times (\text{length} + \text{width})$

Volume = length $\times$ width $\times$ height

$1 \text{ m}^3 = 1\,000 \text{ litres}$

Use ANNEXURE C and the information above to answer the questions that follow.

3.2.1 Calculate the perimeter of the base of the compost box. (4)

- 3.2.2
- First, the boxes of Section A and Section C were completely assembled.
 - The box in Section B fits in between Section A and Section C.
 - Section B has fewer front panel boards than the back and shares side panel boards with Section A and Section C, as shown on ANNEXURE C.

Determine how many additional panel boards are required to completely assemble the box in Section B. (3)

3.2.3 The maximum height of the decomposing compost matter in each section, C : B : A, is in the ratio 3 : 5 : 7.

Determine, in litres, the total capacity for the decomposing matter in Section A and Section B. (6)

3.3 If the temperature rises above 70°C , the compost will sterilise itself (kill the good micro-organisms).

Convert this temperature to degrees Fahrenheit.

Use the formula: $^\circ\text{C} = \frac{5}{9} \times (^\circ\text{F} - 32^\circ)$ (3)
[33]

QUESTION 4

4.1 Anda is a teacher in Zambia. ANNEXURE D shows a detailed layout plan of the school building where he teaches.

Use the information in ANNEXURE D to answer the questions that follow.

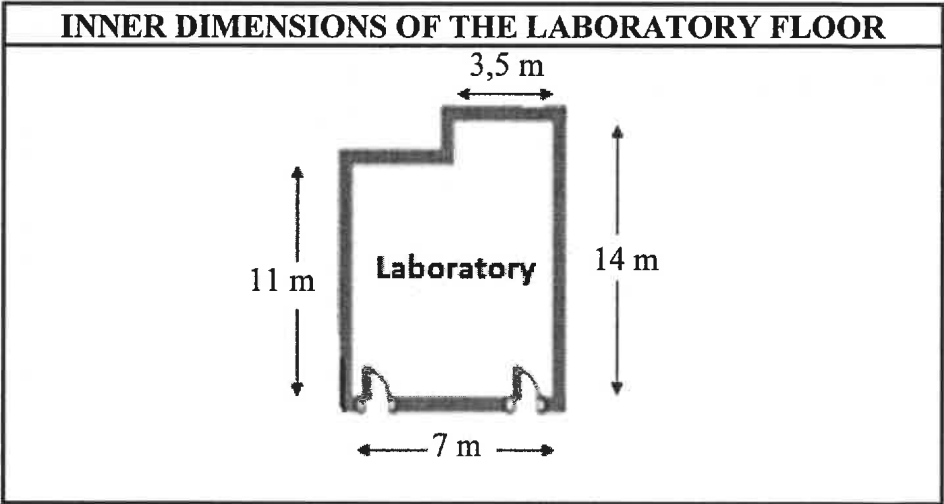
- 4.1.1 Write down, in simplified form, the ratio of the number of single doors to the number of double doors on the school layout plan. (3)
- 4.1.2 Name the rooms that have TWO double doors and ONE single door. (3)
- 4.1.3 State ONE feature that indicates that the school has more than one level. (2)
- 4.1.4 During an evacuation drill, Anda took the following route:
 - Exited the room and turned left into the hallway
 - Went straight past three single doors on the left and a fire extinguisher on the right
 - Turned right at the end of that hallway
 - Passed two rooms each having a double door
 - Then used the 'Exit to use in case of fire'

Determine the room from which Anda exited during the evacuation drill. (3)

4.1.5 The laboratory floor needs to be re-tiled.

The dimensions of the tiles that will be used are: 600 mm × 600 mm.
There are five tiles in a box.

The sketch and inner dimensions of the laboratory floor are below.



The science teacher claimed that they would need a minimum of 40 boxes of tiles to tile the laboratory floor if cutting and breakages are ignored.

Verify, showing ALL calculations, if his claim is VALID.

Use the formula: **Area of a rectangle = length × width** (10)

4.2

Anda uses the strip map in ANNEXURE E to plan his travels.

ANNEXURE E shows the strip map of roads connecting Zambia to South Africa.

Use the information in ANNEXURE E to answer the questions that follow.

4.2.1 Write down the total number of countries shown on the strip map. (2)

4.2.2 Name the town that is 403 km from Bulawayo. (2)

4.2.3 Anda travelled from Victoria Falls to Bulawayo. He had to pick up a friend from Hwange N.P. before reaching Bulawayo. Anda left Victoria Falls at 09:55 and travelled at an average speed of 97 km/h to Hwange N.P.

(a) Determine, to the nearest minute, at what time he reached his friend.

You may use the formula: **Speed = distance ÷ time** (5)

(b) Calculate the total distance he travelled from Victoria Falls to Bulawayo. (3)

[33]

QUESTION 5

- 5.1
- Bontle owns a four-storey building with eight similar apartments, which she rents out.

ANNEXURE F shows the layout plan of the ground floor of the four-storey building showing two apartments.

PICTURE OF THE FRONT OF THE APARTMENT BUILDING



The total exterior length of the building is 58 feet.

Use ANNEXURE F and the information above to answer the questions that follow.

- 5.1.1

Write down the number of enclosed balconies in this building.

(2)
- 5.1.2

Calculate, in feet, missing value A on the layout plan.

(5)
- 5.1.3

Give ONE valid reason why Bontle stated that the apartments are open-plan living.

(2)
- 5.1.4

Identify the name of ONE common feature found in each of the bathrooms.

(2)
- 5.1.5

One of the apartment entrance doors has 3B as a number.

Give a possible interpretation of this number.

(2)
- 5.1.6

Bontle calculated the exterior length of the building to be 17,6784 m.

(a)

Determine, rounded to THREE decimal places, the conversion factor she used in the form 1 m = ... feet.

(3)

(b)

Hence, convert to metres the exterior width of the building.

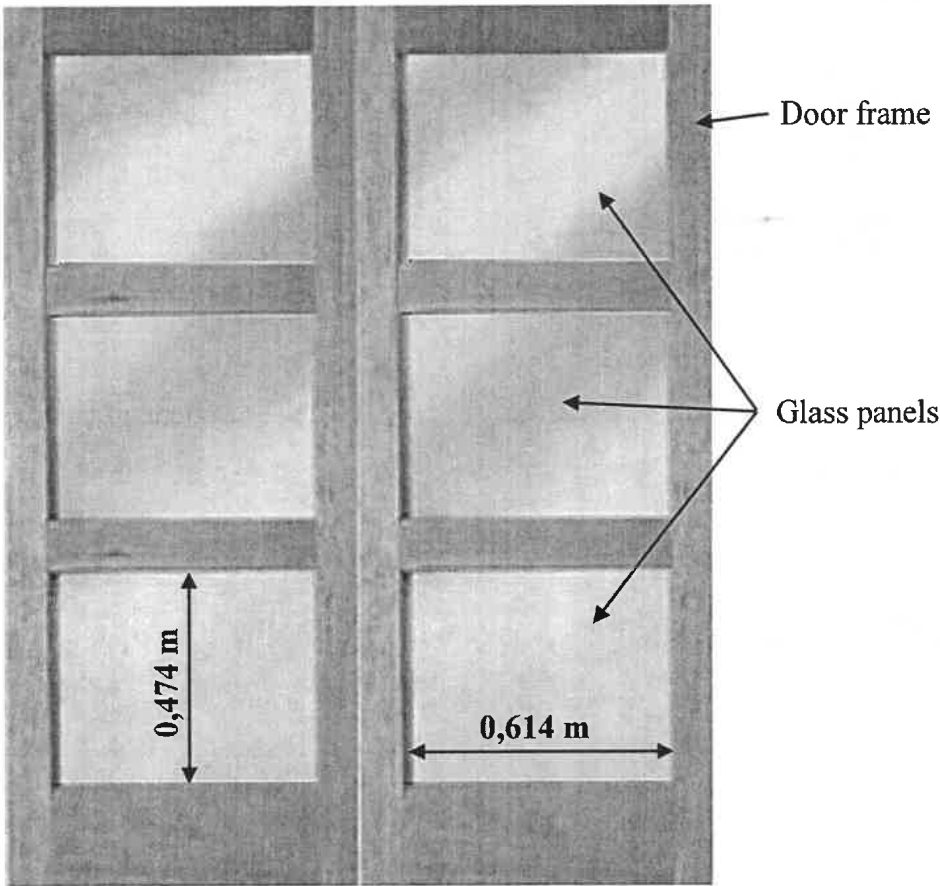
(3)

5.2 The entrance door of the apartment building is a double door with six equally sized glass panels.

Bontle wants to replace all the glass panels with laminated safety glass. She received the following information:

- Mass of the safety glass is 15 kg per m²
- Price of the safety glass is R490 per m²
- Delivery charge is R820 for the first 20 kilograms, and thereafter R53,50 per kg, or part thereof
- Consider only the inner measurements for glass panels (ignore overlaps)

PICTURE OF THE ENTRANCE DOOR WITH INNER DIMENSIONS OF THE ORIGINAL GLASS PANELS



You may use the formula: **Area of a rectangle = length × width**

5.2.1 Calculate, rounded to ONE decimal place, the area of ONE glass panel. (2)

5.2.2 Bontle stated that it will cost her less than R2 000 for the purchase and delivery of all the safety glass panels for the double door.

Verify, showing ALL calculations, whether her statement is VALID. (8)
[29]

TOTAL: 150

