



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2024

Stanmorephysics.com

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. .

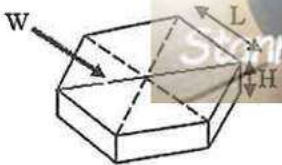
TABLE 1: EXPLANATIONS AND DEFINITIONS OF CONCEPTS

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	

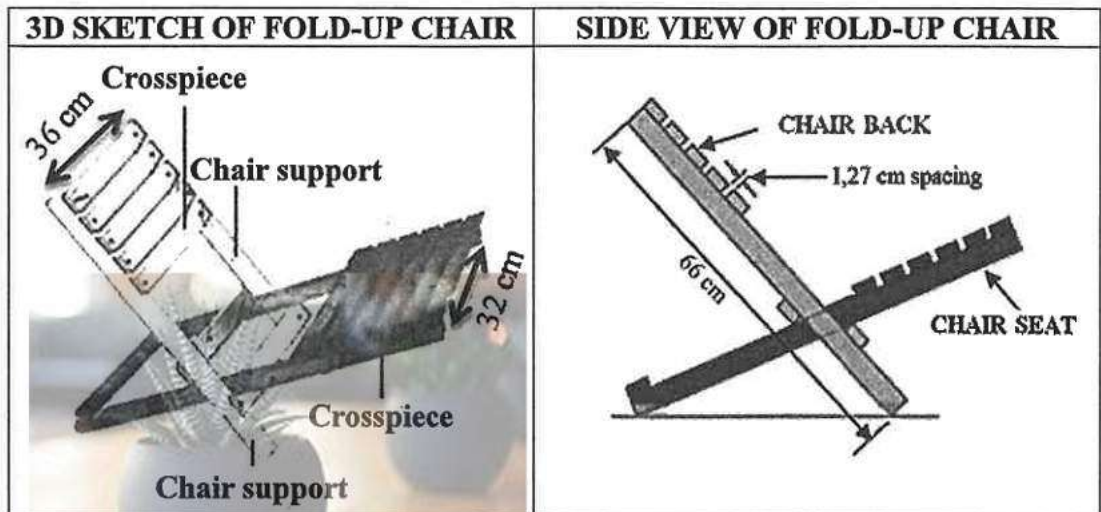
[Source: econbrick.co.za]

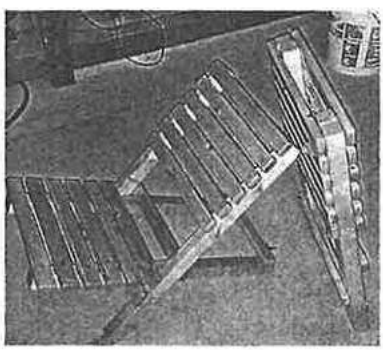
Use the information above to answer the questions that follow.

- 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. (2)
- A Volume = $6 \times \text{area of triangle} \times \text{height}$
- B Volume = side length + height + width
- C Volume = $6 \times \text{perimeter} \times \text{height}$
- 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.



MATERIAL LIST			ASSEMBLED CHAIR AND FOLDED-UP CHAIR
#	Wooden Item	Dimensions (in cm)	
4	Chair supports	$1,9 \times 3,8 \times 66$	
13	Crosspieces	$1,9 \times 3,8 \times 36$	
1	Seat back, bottom crosspiece	$1,9 \times 3,8 \times 32$	
NOTE: - The thickness of the wood is the smallest dimension. # is the number of item(s).			[Adapted from 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.

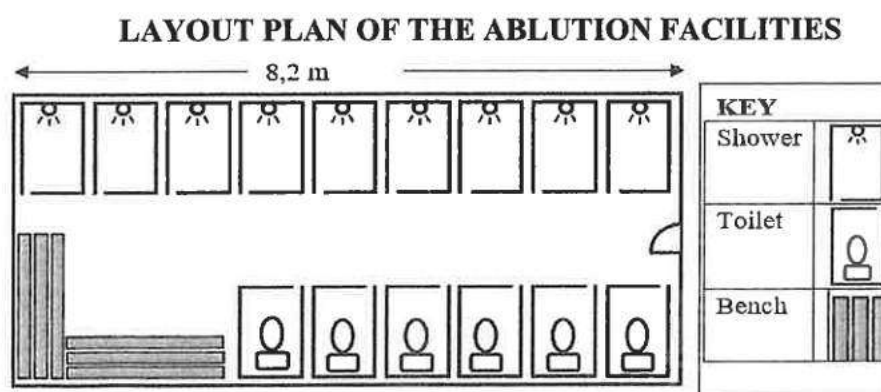
- 2.1.1 Explain what is meant by *aerial view*. (2)
- 2.1.2 Calculate the maximum number of campers that can be accommodated at Baviaanskloof Uitspan camping site. (3)
- 2.1.3 Determine the general direction of the dam from campsite 8. (2)
- 2.1.4 The description below is found on their website:

'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]



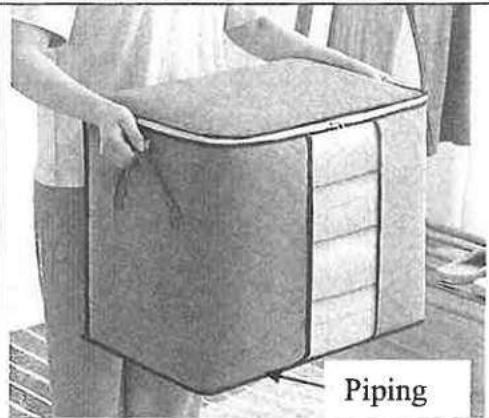
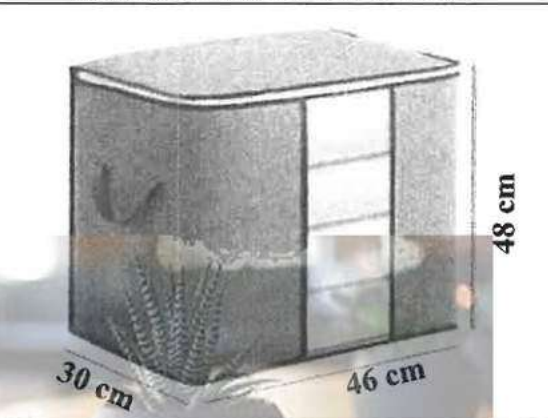
QUESTION 3

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
	

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.

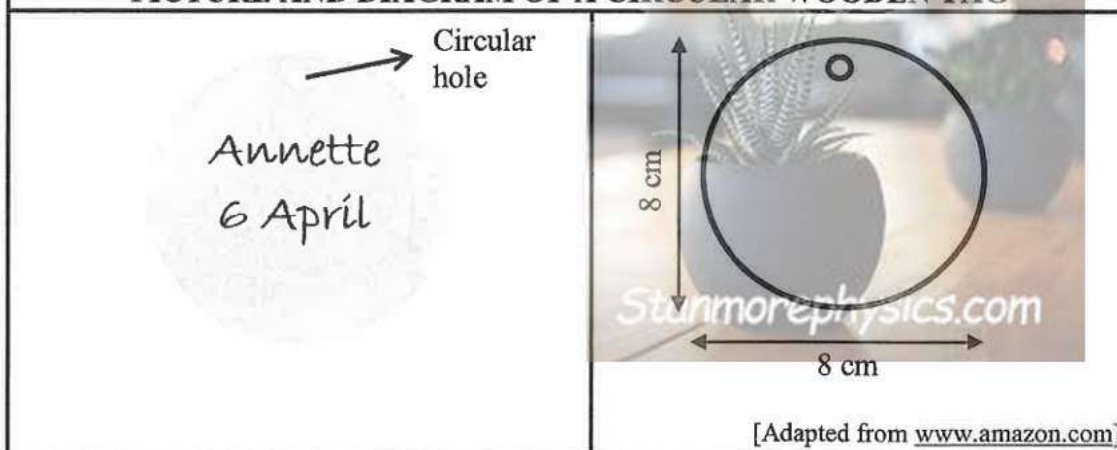
She will write each learner's name and birthday on a small circular wooden tag and attach the tag to the correct month.

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 $6 \text{ m}^2/\ell$.

PICTURE AND DIAGRAM OF A CIRCULAR WOODEN TAG



[Adapted from www.amazon.com]

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:

$$\text{Circumference of a circle} = 3,142 \times \text{diameter} \quad (2)$$

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:

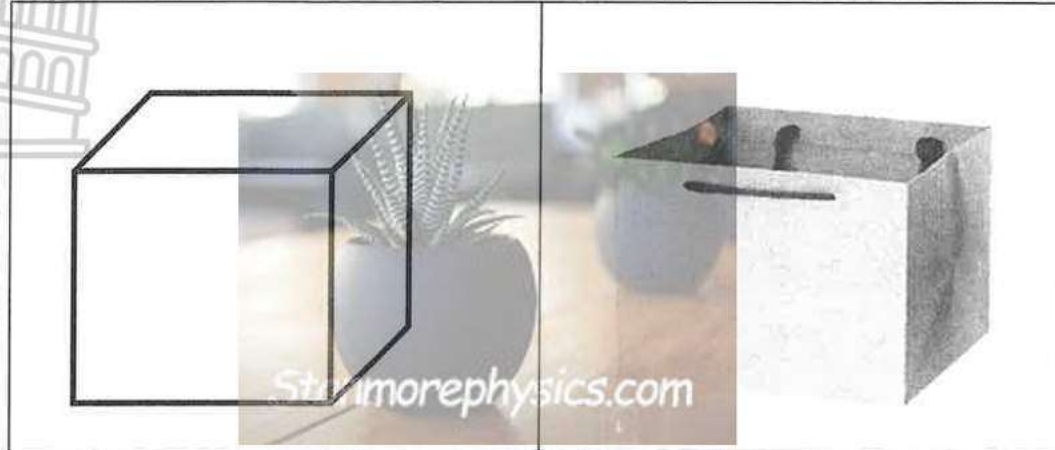
$$\text{Area of a circle} = 3,142 \times \text{radius}^2 \quad (9)$$



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 $2\,744\text{ cm}^3$.

Calculate the side length of the cubic-shaped packet.

You may use the following formula:

$$\text{Volume of a cube} = \text{side} \times \text{side} \times \text{side} \quad (4)$$

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

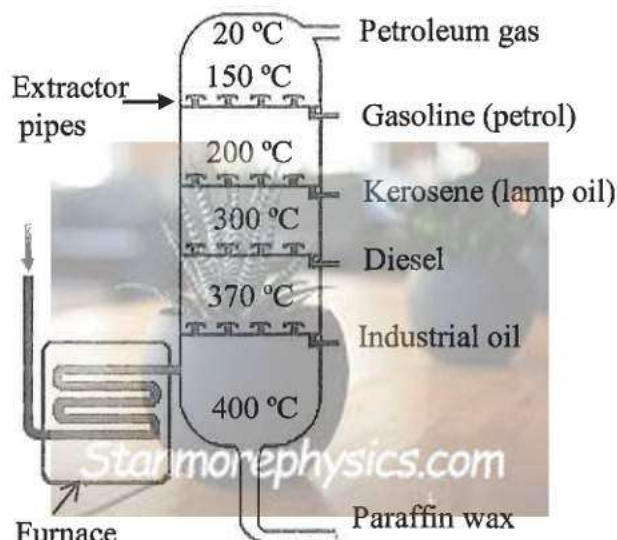
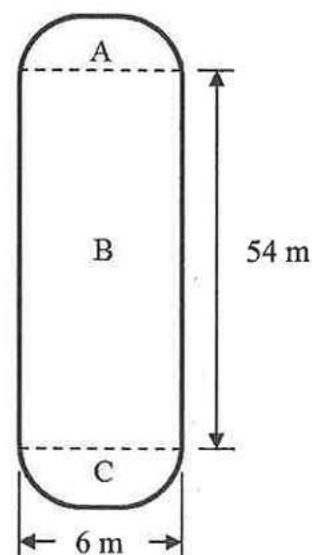


DIAGRAM OF A VERTICAL, CYLINDRICAL TOWER



[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.

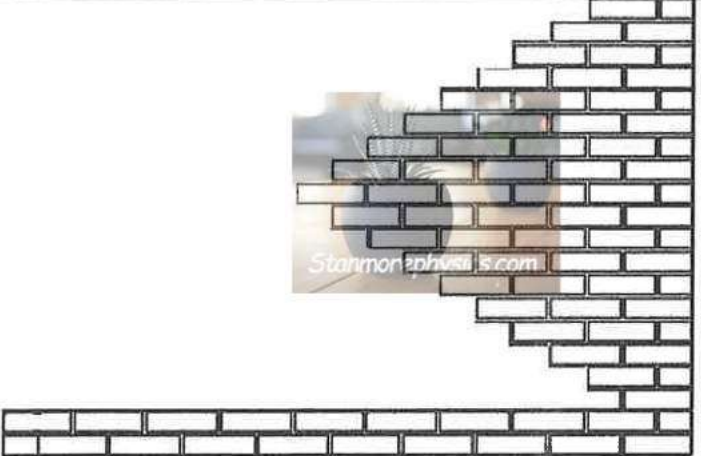
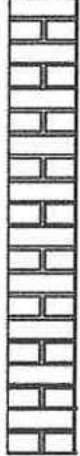
Use the formula:

$$\text{Surface area of an open cylinder} = 3,142 \times \text{diameter} \times \text{height} \quad (7)$$



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. (4)
- You may use the following formula: **Distance = speed × time**

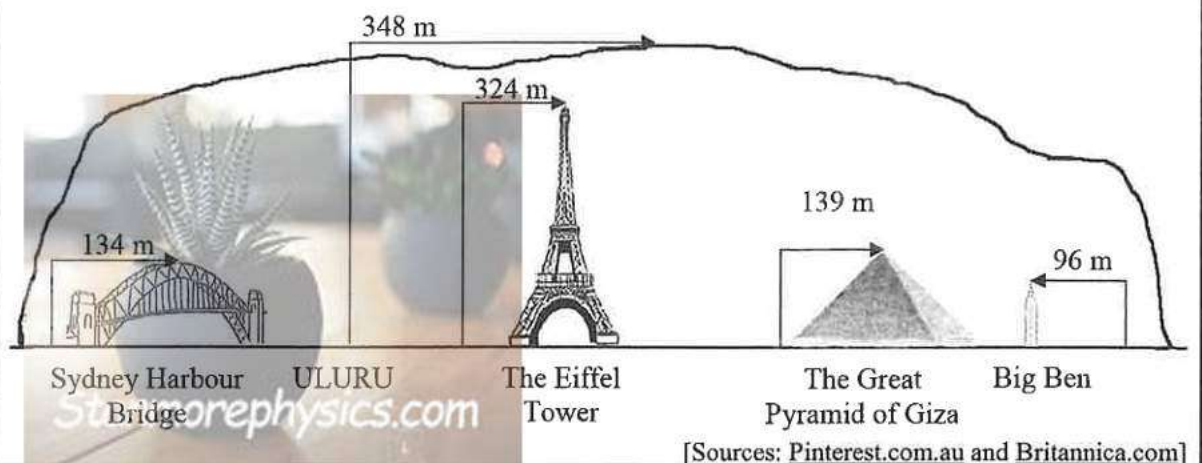
5.2

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.



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





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MATHEMATICAL LITERACY P2

ADDENDUM

NOVEMBER 2024

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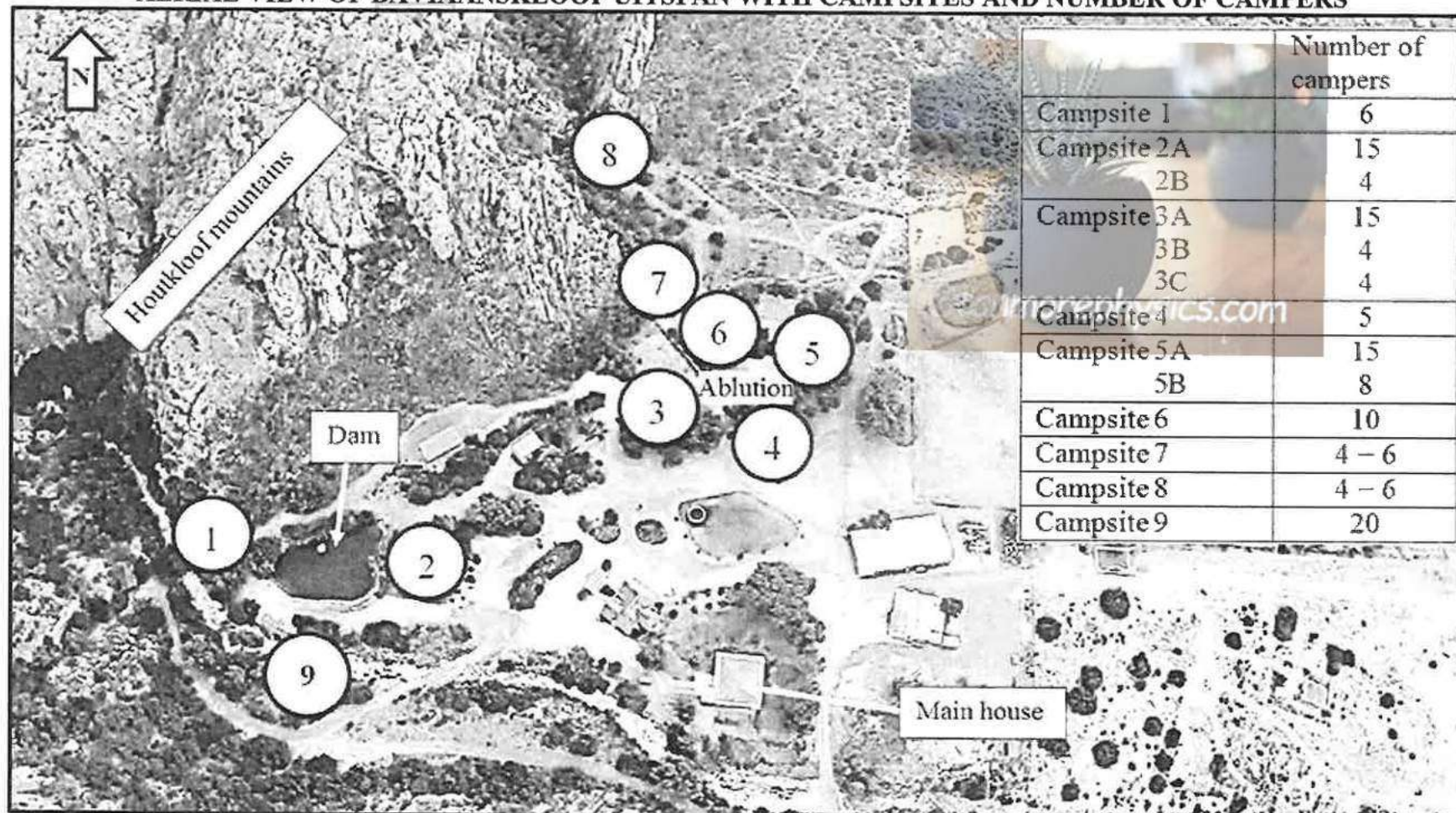
This addendum consists of 4 pages with 3 annexures.



ANNEXURE A

QUESTION 2.1

AERIAL VIEW OF BAVIAANSKLOOF UITSPAN WITH CAMPSITES AND NUMBER OF CAMPERS



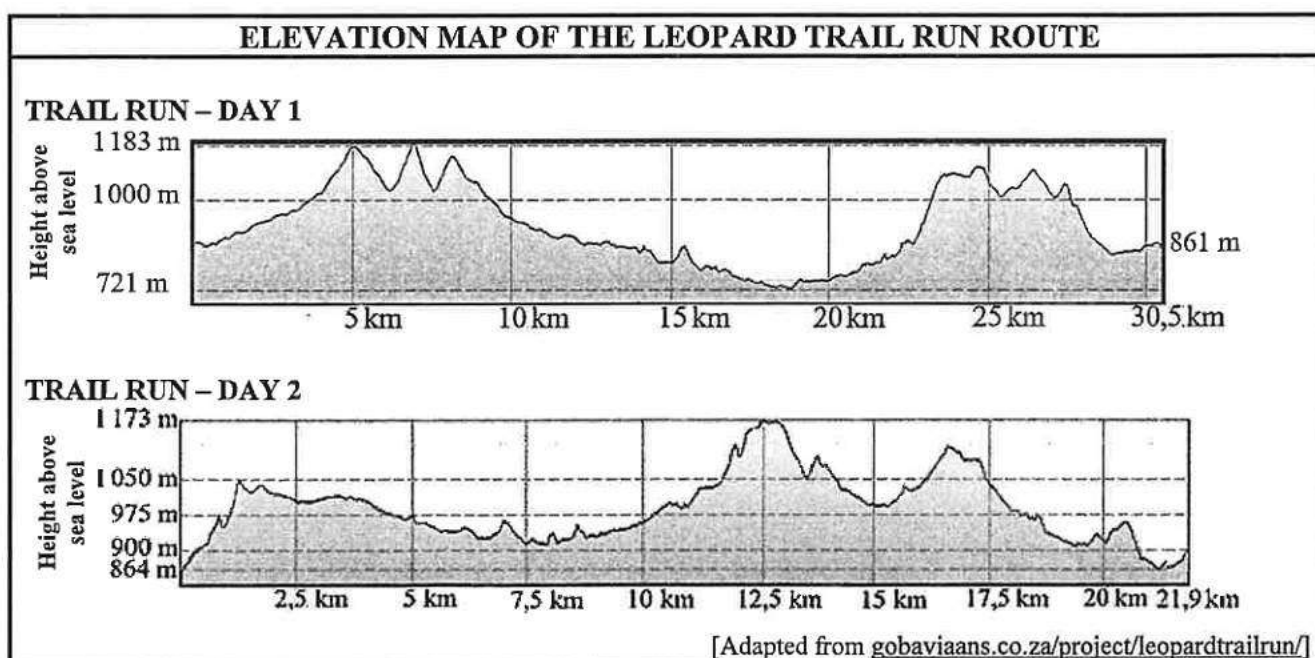
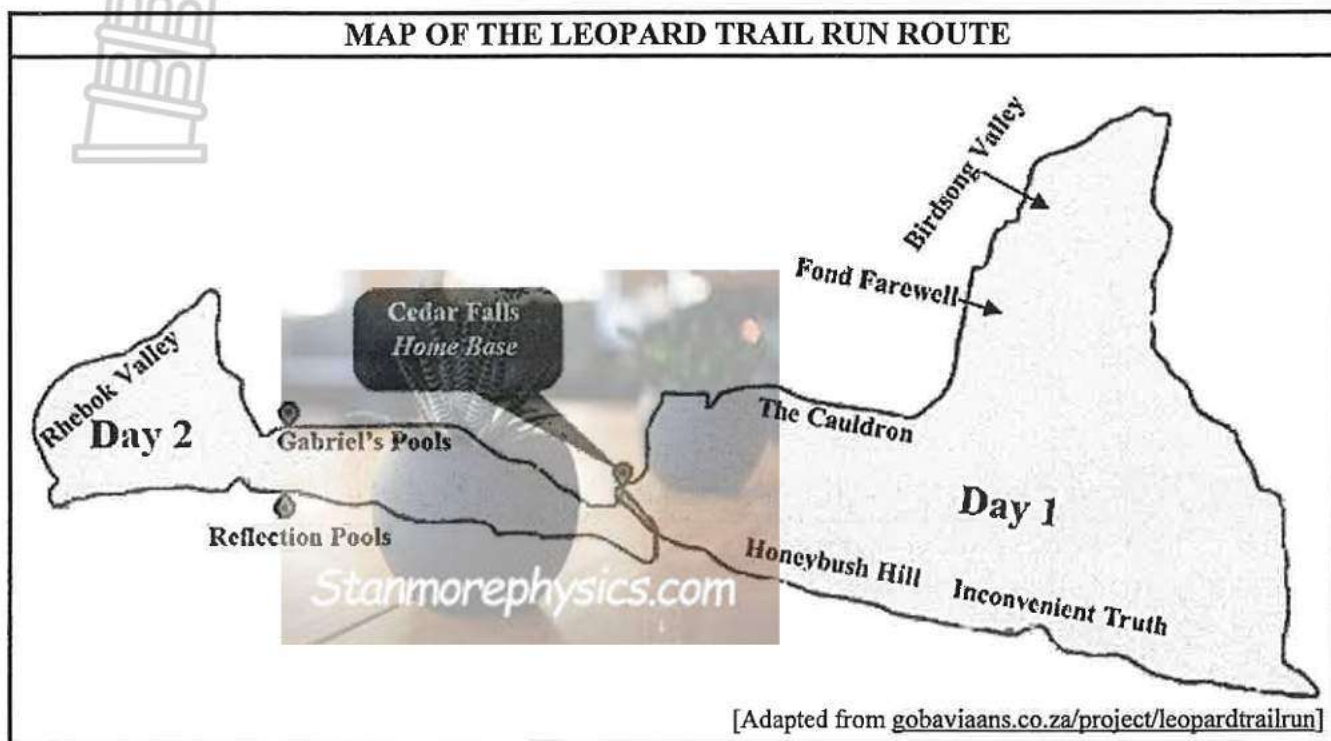
NOTE: The bigger the hut, the more expensive it is.

[Adapted from baviaansuitspan.co.za/page/baviaanskloof-camping]



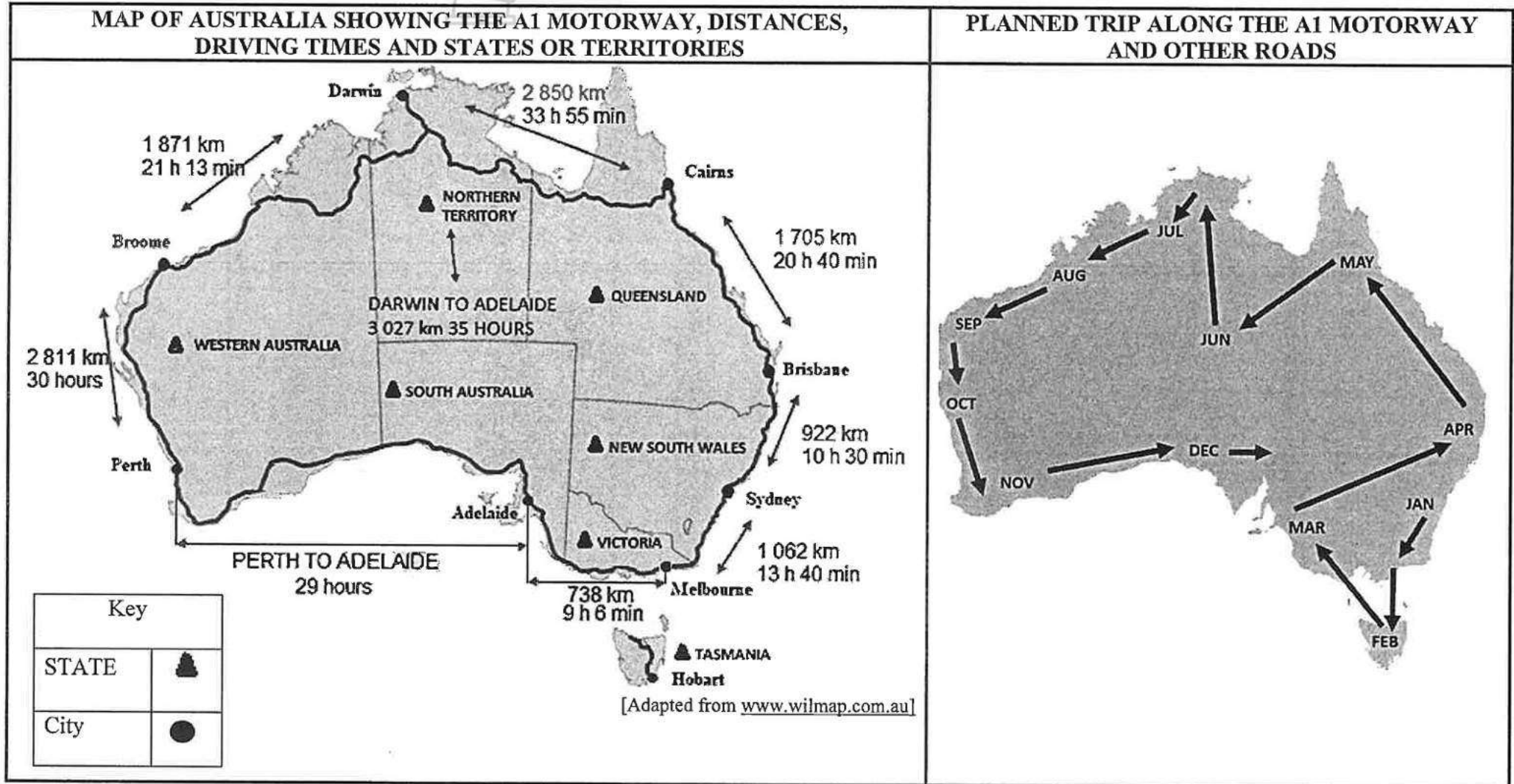
ANNEXURE B

QUESTION 2.2: MAP AND ELEVATION MAP OF THE LEOPARD TRAIL RUN .



ANNEXURE C

QUESTION 5





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GRADE/GRAAD 12

**MATHEMATICAL LITERACY P2/
WISKUNDIGE GELETTERDHEID V2**

NOVEMBER 2024

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 150

Symbol/Kode	Explanation/Verduideliking
MA	Method with accuracy/Metode met akkuraatheid
MCA	Method with consistent accuracy/Metode met volgehoue akkuraatheid
CA	Consistent accuracy/Volgehoue akkuraatheid
A	Accuracy/Akkuraatheid
C	Conversion/Herleiding
S	Simplification/Vereenvoudiging
RT	Reading from a table/graph/document/diagram/Lees vanaf tabel/grafiek/dokument/diagram
SF	Correct substitution in a formula/Korrekte vervanging in 'n formule
O	Opinion/Explanation/Opinie/Verduideliking
P	Penalty, e.g. for no units, incorrect rounding off, etc./Penalising, bv. vir geen eenhede, verkeerde afronding, ens.
NPR	No penalty for correct rounding/Geen penalising vir korrekte afronding nie
NPU	No penalty for omitting unit, but wrong unit is penalised/Geen penalising indien die eenheid uitgelos is nie, maar wel indien 'n verkeerde eenheid gebruik word.
AO	Answer only/Slegs antwoord

**These marking guidelines consist of 17 pages.
Hierdie nasienriglyne bestaan uit 17 bladsye.**

NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled) version.
- Consistent accuracy (CA) applies in ALL aspects of the marking guidelines; however it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra item presented.
- Rounding is an independent mark.
- General principle of marking, if the candidate makes one mistake one mark is deducted.
- A conclusion mark can only be given if $\frac{1}{3}$ of the total marks for the sub-question have been awarded.
- No penalty for rounding (NPR) if the first decimal is correct.

LET WEL:

- As 'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.
- As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, sien die doodgetrekte (gekanselleerde) poging na.
- Volgehoue akkuraatheid (CA) word in ALLE aspekte van die nasienriglyne toegepas; dit hou egter op by die tweede berekeningsfout.
- Wanneer 'n kandidaat aflesings vanaf 'n grafiek,, tabel, uitlegplan en kaart aanbied en ekstra antwoorde gee, penaliseer vir elke ekstra item.
- Afronding tel as 'n afsonderlike punt.
- Die algemene beginsel van nasien is, as 'n leerder een fout maak, word een punt afgetrek.
- 'n Gevolgtrekkingspunt kan slegs gegee word indien $\frac{1}{3}$ van die totale punte vir die subvraag toegeken is.
- Geen penalisering vir afronding (NPR) nie as die eerste desimaal korrek is.

QUESTION/VRAAG 1 [26 MARKS/26 PUNTE] ANSWER ONLY FULL MARKS			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
* 1.1.1	D ✓✓ A	2A correct option (2)	M L1 E
* 1.1.2	E ✓✓ A	2A correct option (2)	MP L1 E
* 1.1.3	C ✓✓ A	2A correct option (2)	M L1 E
* 1.1.4	G ✓✓ A	2A correct option (2)	M L1 E
1.2.1	✓ MA 220 mm ÷ 1 000 = 0,22 m ✓ A	1MA ÷ 1 000 1A conversion (2)	M L1 E
* 1.2.2	A ✓✓ A	2A correct option. (2)	M L1 M
* 1.2.3	Number of bricks / Aantal stene ✓RT = 2 860 mm ÷ 220 mm = 13 ✓A ✓MA	1RT correct values 1MA dividing 1A number of bricks (3)	M L1 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
* 1.3.1	18 ✓✓A	2A correct number (2)	MP L1 E
* 1.3.2	Number of cross pieces / <i>Getal dwarsstutte</i> ✓RT $= 6 \times 3$ ✓A $= 18$ ✓A	1RT 6 1A multiply by 3 1A pieces (3)	MP L1 M
* 1.3.3	Chair support / <i>Rugleuningbalk</i> ✓✓RT	2RT correct option (2)	MP L1 E
1.3.4	1,9 cm ✓✓A	2A correct dimension NPU (2)	MP L1 E
1.3.5	Space between cross pieces:/ <i>Opening tussen dwarsstutte</i> : ✓ RT Space/Opening = $1,27 \times 10$ mm = 12,7 mm ✓ MCA	1RT correct value 1MCA simplification NPU (2)	MP L1 E
		[26]	

QUESTION 2 [31 MARKS/31 PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
2.1.1	View from the top. ✓✓ A <i>Aansig van bo.</i> OR/OF View of the landscape from a certain height above ground like from a satellite or drone. ✓✓ A <i>Aansig van die landskap vanaf 'n seker hoogte bo die grond soos vanaf 'n satelliet of hommeltuig.</i> OR/OF View from an elevated height. ✓✓ A <i>Aansig vanaf 'n verhewe hoogte.</i> OR/OF Birds-eye view. ✓✓ A <i>Voëlperspektief.</i> 	2A correct explanation (2)	MP L1 E
2.1.2	Number of campers/<i>Getal kampeerders</i> ✓RT ✓MCA $= 6 + 15 + 4 + 15 + 4 + 4 + 5 + 15 + 8 + 10 + 6 + 6 + 20$ $= 118$ ✓CA OR/OF Number of campers/<i>Getal kampeerders</i> ✓RT ✓MCA $= 20 + 15(3) + 10 + 8 + 6(3) + 5 + 4(3)$ $= 118$ ✓CA	1RT all correct values 1MCA adding values 1CA simplification AO OR/OF 1RT all correct values 1MCA adding values 1CA simplification AO (3)	MP L1 E
2.1.3	South West/SW/ <i>Suidwes</i> SW ✓✓ A	2A compass direction (2)	MP L1 E
* 2.1.4	2 ✓✓ O	2O identifying correct site (2)	MP L2 M
2.1.5	$\frac{3}{13} \times 100\%$ ✓A ✓A $= 23,076923\%$ ✓CA	1A correct numerator 1A correct denominator 1CA simplification NPR (3)	P L2 D
2.1.6 (a)	9 showers/ <i>storte</i> ✓✓ A	2A correct number (2)	MP L1 E

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
* 2.1.6 (b)	✓A 90 mm = 8,2 m ✓C 90 mm = 8 200 mm (÷ 90) ✓M 1 : 91,11 1 : 91 ✓R OR/OF ✓A 9 cm : 8,2 m 9 cm : 820 cm ✓C = 1 : 91,11.. ✓M = 1 : 91 ✓R Accept ± 1 mm deviation on measurement per province Aanvaar ± 1 mm-afwyking op meting per provinsie	1A measured distance 1C convert to mm 1M divide by 90 1R rounded answer OR/OF 1A measured distance 1C convert to cm 1M divide by 9 1R rounded answer (4)	MP L2 M
2.1.6 (c)	To allow people to sit while waiting for a toilet or shower to become available. ✓✓O <i>Vir mense om op te sit terwyl hulle wag dat 'n toilet of stort beskikbaar word.</i> OR/OF To place your clothes or belongings on while you are showering. <i>Om jou klere of besittings neer te sit terwyl jy stort.</i> OR/OF To sit while you change your outfit, or getting dressed or apply body lotion or for baby nappy change. <i>Om op te sit terwyl jy jou uitrusting verander of terwyl jy aantrek of lyfroom aansmeer of babadoeke verander.</i>	2O reason (2)	MP L4 M
2.2.1	Day 2 / Dag 2 ✓✓A	2A correct description (2)	MP L2 E
* 2.2.2	D ✓✓RT	2RT correct option (2)	MP L2 M
* 2.2.3	12,5 km ✓✓RT	2RT correct distance (2)	MP L2 E

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
2.2.4	The part shows a continuous downward slope, it is downhill. ✓✓O <i>Die part het 'n aaneenlopende afwaartse helling getoon, dit is afdraand.</i> OR/OF That part does not have many uphill. <i>Daardie deel het nie baie opdraandes nie.</i>	20 correct explanation (2)	MP L4 E
* 2.2.5	Difference in height/Verskil in hoogte  Difference/Verskil = 1 050 m – 900 m = 150 m He is CORRECT. / Hy is KORREK	1RT 1st correct value 1RT 2nd correct value 10 conclusion (3)	MP L4 M
			[31]

QUESTION/VRAAG 3 [31 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
* 3.1.1	$\checkmark$ MA $= 14:13 - 12:55$ $\checkmark$ A $= 1 \text{ hour } 18 \text{ minutes/} 1 \text{ uur } 18 \text{ minute}$ OR/OF 78 minutes OR/OF 1,3 hours/uur	1MA subtracting time 1A simplification [1hr18min] AO (2)	M L2 M
* 3.1.2	Total height of 4 pillows/Totale hoogte van 4 kussings $= 11 \text{ cm} \times 4 \checkmark$ MA $= 44 \text{ cm} \checkmark$ CA Difference/Verskil $\checkmark$ RT $= 48 \text{ cm} - 44 \text{ cm}$ $= 4 \text{ cm} \checkmark$ CA OR/OF $\checkmark$ RT $\checkmark$ MA $\checkmark$ MA Difference = $48 \text{ cm} - 11 \text{ cm} - 11 \text{ cm} - 11 \text{ cm} - 11 \text{ cm}$ $= 4 \text{ cm} \checkmark$ CA	 1MA multiplying by 4 1CA simplification 1RT height 1CA simplification OR/OF 1RT height 1MA subtracting 11 cm 1MA subtracting all the 11's 1CA simplification AO (4)	M L2 E
3.1.3	Perimeter = 2 (length + width)/ Omtrek = 2 (lengte + breedte) Perimeter/Omtrek = 2 (46 cm + 30 cm) $\checkmark$ SF $= 2 (76 \text{ cm})$ $= 152 \text{ cm} \checkmark$ CA Total length for 4 bags/Totale lengte vir 4 sakke $= 152 \times 4 \checkmark$ MA $= 608 \text{ cm}$ $= \frac{608 \text{ cm}}{100}$ $= 6,08 \text{ m} \checkmark$ C $\therefore$ she must buy 6,5 m/ $\checkmark$ R Sy moet 6,5 m koop OR/OF	1SF correct substitution 1CA simplification 1MA multiply by 4 1C simplification 1R correct rounding OR/OF	M L3 M

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
	$30 \text{ cm} \div 100 = 0,3 \text{ m}$ $46 \text{ cm} \div 100 = 0,46 \text{ m}$ ✓C Perimeter/Omtrek = $2(0,3 \text{ m} + 0,46 \text{ m})$ ✓SF $= 1,52 \text{ m}$ ✓CA Total / Totaal = $1,52 \text{ m} \times 4$ ✓MCA $= 6,08 \text{ m}$ ✓R $\therefore$ she must buy 6,5 m/ Sy moet 6,5 m koop OR/OF Using $\frac{1}{2}$ metre lengths/ Gebruik $\frac{1}{2}$ metre lengtes Perimeter/Omtrek = $2(46 \text{ cm} + 30 \text{ cm})$ ✓SF $= 152 \text{ cm}$ ✓CA Total length for 4 bags / Totale lengte vir 4 sakke $= 152 \times 4$ ✓MA $= 608 \text{ cm}$ $\frac{1}{2} \text{ m} = 50 \text{ cm}$ ✓C Number of half metre lengths / Getal half-meter lengtes $= 608 \text{ cm} \div 50 \text{ cm}$ $= 12,16$ ≈ 13 ✓R	1C metre 1SF correct substitution 1CA simplification 1MCA multiply by 4 1R correct rounding OR/OF 1SF correct substitution 1CA simplification 1MA multiply by 4 1C to centimetre 1R correct rounding	(5)
* 3.2.1	Circumference / Omtrek ✓SF $= 3,142 \times 8 \text{ cm}$ $= 25,136 \text{ cm}$ ✓A	1SF substitute diameter 1A simplification NPR AO	M L2 E (2)
3.2.2	Radius/Radius $= \frac{8 \text{ cm}}{2}$ ✓MA $= 4 \text{ cm}$ ✓A	1MA concept of radius 1A simplification NPU AO	M L1 E (2)

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
3.2.3	Area of a circle/Area/Oppervlakte van 'n sirkel ✓SF $= 3,142 \times (4 \text{ cm})^2$ $= 3,142 \times 16 \text{ cm}^2$ ✓MCA $= 50,272 \text{ cm}^2$ ✓CA Area to be painted / Oppervlakte wat geverf moet word Area = $50,272 - 0,3142 = 49,9578 \text{ cm}^2$ ✓CA Total area / Totale opp. = $36 \times 49,9578 \text{ cm}^2$ $= 1\,798,4808 \text{ cm}^2$. ✓MCA Total area in m^2 / Totale opp. in m^2 $= 1\,798,4808 \div 100^2$ $= 0,179848 \text{ m}^2$. ✓C $6 \text{ m}^2 = 1 \ell = 1000 \text{ ml}$ ✓MA $\dots \text{ m}^2 = 50 \text{ ml}$ $0,3 \text{ m}^2 = 50 \text{ ml}$ $0,3 \text{ m}^2 > 0,179848 \text{ m}^2$ ✓CA Therefore 50 ml will be more than sufficient. / ✓O Daarom sal 50 ml meer as genoeg wees. OR/OF Area of a circle/Area/Oppervlakte van 'n sirkel ✓SF $= 3,142 \times (4 \text{ cm})^2$ ✓MCA $= 50,272 \text{ cm}^2$ ✓CA Area to be painted/Oppervlakte wat geverf moet word Area = $50,272 \text{ cm}^2 - 0,3142 \text{ cm}^2 = 49,9578 \text{ cm}^2$ ✓CA Total area / Totale oppervlakte $= 36 \times 49,9578 \text{ cm}^2 = 1\,798,4808 \text{ cm}^2$. ✓MCA $= 1\,798,4808 \div 100^2$ $= 0,179848 \text{ m}^2$ ✓C	CA from Question 3.2.2 1SF correct substitution 1MCA squaring 1CA simplification 1CA difference 1MCA multiply by 36 1C dividing by 10 000 or 100^2 1MA using ratio 1CA comparing areas. 1O verification OR/OF 1SF correct substitution 1MCA squaring 1CA simplification 1CA difference 1MCA multiply by 36 1C dividing by 10 000 or 100^2	M L4 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	Paint/ verf 6 m^2 with/met 1ℓ $\therefore 0,17984808 \text{ m}^2$ with /met $n \ell$ $n = \frac{0,17984808}{6} \ell$ ✓MCA $= 0,02997466 \ell$ $\approx 30 \text{ ml}$ ✓CA VALID / GELDIG ✓O Area of ONE circle/Oppervlakte van EEN sirkel $= 3,142 \times (4 \text{ cm})^2$ ✓SF $= 50,272 \text{ cm}^2$ ✓MCA ✓CA Area to be painted/Oppervlakte wat geverf moet word $= 50,272 \text{ cm}^2 - 0,3142 \text{ cm}^2 = 49,9578 \text{ cm}^2$ ✓CA $6 \text{ m}^2 : 1 \ell$ $60\,000 \text{ cm}^2 : 1\,000 \text{ ml}$ ✓C $49,9578 : ?$ Paint needed/ Verf benodig $\frac{49,9578 \times 1\,000}{60\,000}$ ✓MCA $= 0,83263 \text{ ml}$ Paint for 36/ Verf vir 36 $= 0,83263 \text{ ml} \times 36$ ✓MCA $= 29,97 \text{ ml}$ ✓CA $\therefore$ VALID / GELDIG ✓O Radius $= \frac{4 \text{ cm}}{100} = 0,04 \text{ m}$ ✓SF Area of circle/ Opp van sirkel $= 3,142 \times (0,04)^2$ ✓MCA $= 0,0050272 \text{ m}^2$ ✓CA Area of circular hole/ Opp van gaatjie $= \frac{0,3142}{10\,000}$ ✓C $= 0,0000314 \text{ m}^2$ Area to be painted $= 0,0050272 \text{ m}^2 - 0,00003142 \text{ m}^2$ $= 0,00499578 \text{ m}^2$ ✓CA $\therefore 0,00499578 \text{ m}^2 \times 36$ $= 0,17984808 \text{ m}^2$ ✓MCA Amount of paint/Hoeveelheid verf $= \frac{0,17984808}{6 \ell} \times 1\,000 \text{ ml}$ ✓MCA $= 29,97468 \text{ ml} \approx 30 \text{ ml}$ ✓CA $\therefore 30 \text{ ml}$ is less than 50 ml VALID / GELDIG ✓O	1MCA using ratio 1CA paint needed 1O verification OR/OF 1SF correct substitution 1MCA squaring 1CA simplification 1CA difference 1C converting , 1MCA using ratio 1MCA multiply by 36 1CA paint needed 1O verification OR/OF 1SF correct substitution 1MCA squaring 1CA simplification 1C dividing by 10 000 1CA difference 1MCA multiply by 36 1MCA using ratio 1CA paint needed 1O verification	

Q/V	Solution/Opplossing	Explanation/Verduideliking	T&L
	OR/OF Area of a circle / <i>Oppervlakte van 'n sirkel</i> $= 3,142 \times 4^2$ ✓SF $= 3,142 \times 16$ ✓MCA $= 50,272 \text{ cm}^2$ ✓CA Area to be painted / <i>Oppervlakte wat geverf moet word</i> $\text{Area / Opp} = 50,272 - 0,3142$ $= 49,9578 \text{ cm}^2$ ✓CA $6 \text{ m}^2 / \ell = 60\,000 \text{ cm}^2 / \ell$ $= 60\,000 \text{ cm}^2 / 1\,000 \text{ ml}$ ✓C Amount of paint for one tag / <i>Hoeveelheid van verf per houtplaatjie</i> $= 49,9578 \div 60\,000 \times 1\,000$ ✓MCA $= 0,83263 \text{ ml}$ Paint for 36 tags/ <i>Verf vir 36 houtplaatjies</i> $0,83263 \text{ ml} \times 36$ ✓MCA $= 29,97468 \text{ ml}$ ✓CA VALID / <i>GELDIG</i> ✓O	OR/OF 1SF correct substitution 1MCA squaring 1CA simplification 1CA difference 1C conversion 1MCA using ratio 1MCA multiply by 36 1CA paint needed 1O verification (9)	
* 3.3.1	Volume of a cube = side $\times$ side $\times$ side/ <i>Volume van 'n kubus = sy $\times$ sy $\times$ sy</i> ✓SF ✓SF $2\,744 \text{ cm}^3 = \text{side} \times \text{side} \times \text{side}$ $(\text{side})^3 = 2\,744 \text{ cm}^3$ ✓MA $14 \times 14 \times 14 = 2\,744$ Side/Sy = 14 cm ✓CA	1SF substitution number 1SF cube unit 1 MA change subject of the formula 1CA simplification (4)	M L3 M
3.3.2	$8 + 7 = 15$ $P = \frac{15}{35}$ ✓A $= 0,42857...$ $\approx 0,43$ ✓CA OR/OF $P = \frac{8}{35} + \frac{7}{35}$ ✓A $= 0,22857... + 0,2$ ✓A $= 0,42857...$ $\approx 0,43$ ✓CA	1A numerator 1A denominator 1CA simplification OR/OF 1A denominator 1A writing as decimals 1CA simplification NPR (3)	P L2 E
		[31]	

QUESTION 4 [29 MARKS]			
Q/V	Solution/Opplossing	Explanation/Verduideliking	T/L
* 4.1.1	Kerosene or lamp oil /Keroseen of Lampolie ✓✓ RT	2RT correct product (2)	MP L1 E
4.1.2	Gasoline or petrol/ Brandstof of Petrol ✓✓ RT	2RT correct product (2)	MP L1 E
* 4.1.3	$^{\circ}\text{C} = \frac{(^{\circ}\text{F} - 32)}{1,8}$ $300^{\circ}\text{C} = \frac{(^{\circ}\text{F} - 32)}{1,8}$ $^{\circ}\text{F} = 1,8 \times 300 + 32$ $= 572$ 	1RT correct value 300 1SF substituting information correctly 1S changing subject of the formula 1CA simplification AO (4)	M L3 M
* (4.1.4)	Surface area of an open cylinder/ Buite-oppervlakte van 'n oop silinder $= 3,142 \times \text{diameter} \times \text{height}$ $= 3,142 \times \text{deursnee} \times \text{hoogte}$ $= 3,142 \times 6 \text{ m} \times 54 \text{ m}$ $= 1\,018,008 \text{ m}^2$ Area of pipes/Oppervlakte van pype $= \frac{2,5}{100} \times \frac{1\,018,008}{1}$ $= 25,4502 \text{ m}^2$ Total Surface Area/Totale buiteoppervlakte $= 1\,018,008 \text{ m}^2 - 25,4502 \text{ m}^2 + 150,816 \text{ m}^2$ $= 1\,143,3738 \text{ m}^2$	1SF substitution 1CA simplification 1MCA percentage calculation 1CA simplification 1MCA subtracting pipe area 1MA adding A + C 1CA total surface area OR/OF	M L3 D

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	Surface area of an open cylinder/<i>Buite-oppervlakte van 'n oop silinder</i> SA = 3,142 × diameter × height/ BO = 3,142 × <i>deursnee</i> × <i>hoogte</i> = 3,142 × 6 m × 54 m ✓ SF = 1 018,008 m² ✓ CA Excluding area of pipes/<i>Oppervlakte van pype uitgesluit</i> ✓ MA ✓ MCA Area (excluding)/<i>Opp(uitgesluit)</i> = $\frac{97,5}{100} \times \frac{1\,018,008}{1}$ = 992,5578 ✓ CA Total SA/<i>Totale BO</i> = 992,5578 m² + 150,816 m² ✓ MA = 1 143,3738 m². ✓ CA	1SF substitution 1CA simplification 1MA less 2,5% 1MCA percentage calculation 1CA simplification 1MA adding A + C 1CA total surface area NPR (7)	
* 4.2.1	Number of bricks in 1 row of a double brick wall <i>Getal stene in een ry van 'n dubbelsteenmuur</i> = 19 ✓✓ RT Number of bricks for 1 garage door <i>Getal stene vir 1 motorhuis deur</i> = 19 × 20 ✓ A = 380 Total number of bricks needed /<i>Totale getal stene nodig</i> = 380 × 2 ✓MCA = 760 ✓R ∴ 2 Pallets of bricks /<i>Stapelborde met stene</i> OR/OF	2RT bricks in double row 1A number of layers 1MCA doubling 1R number of pallets OR/OF	M L2 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	✓ RT ✓ RT Single line wall/Enkelmuur = 20×10 = 200 bricks/ stene ✓ CA Double line wall/Dubbelmuur = $2 \times 200 = 400$ bricks To cover space of two garage doors:/ Om die spasie van twee motorhuisdeure te dek Number of bricks/Getal stene = 2×400 ✓ MCA = 800 Number of pallets needed/ Stapelborde met stene benodig = 2 ✓ R 	1RT bricks (height) 1RT bricks (row) 1CA bricks on double walls 1MCA doubling 1R number of pallets (5)	
4.2.2	✓ MA ✓ SF Area of 2 doors/Opp van 2 deure = $2 \times 2,13 \times 3$ = $12,78 \text{ m}^2$ ✓ A Labour cost/Arbeidskoste = $12,78 \text{ m}^2 \times \text{R}500$ = $\text{R} 6 390$ ✓ CA Brick cost/Steenkoste = $2 \times 525 \times \text{R}6,45$ = $\text{R} 6 772,50$ ✓ CA COST = Other material + Labour + Bricks cost/ KOSTE = Ander materiaal + Arbeid + Steenkoste Total cost/Totale koste = $\text{R}2 000 + \text{R}6 390 + 6 772,50$ = $\text{R}15 162,50$ ✓ CA Not VALID/Nie GELDIG. ✓ O OR/OF	CA pallets from 4.2.1 1MA doubling 1SF correct values 1A simplification 1CA labour cost 1CA brick cost 1CA amount 1O verification OR/OF	M/Fin L4 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	For one door/ Vir een deur Area/ oppervlakte = $2,13 \text{ m} \times 3 \text{ m}$ ✓ SF = $6,39 \text{ m}^2$ ✓ A Labour cost/Arbeidskoste = $6,39 \text{ m}^2 \times \text{R}500$ = $\text{R}3\,195$ ✓ MCA ∴ for two / vir twee = $2 \times \text{R}3\,195$ = $\text{R}6\,390$ ✓ CA Cost per pallet/ koste per stapelbord = $\text{R}6,45 \times 525$ = $\text{R}3\,386,25$ ∴ for two / vir twee = $2 \times \text{R}3\,386,25$ = $\text{R}6\,772,50$ ✓ CA Total cost/Totale koste = $\text{R}2\,000 + \text{R}6\,390 + \text{R}6\,772,50$ = $\text{R}15\,162,50$ ✓ CA Not VALID/Nie GELDIG. ✓ O OR/OF Area of 2 doors / Opp van 2 deure = $2 \times 2,13 \times 3$ ✓ SF = $12,78 \text{ m}^2$ ✓ MA $\approx 13 \text{ m}^2$ (cost per m^2) ✓ CA Labour Cost / Arbeidskoste = $13 \times \text{R}500$ = $\text{R}6\,500$ ✓ CA Brick cost / Steen koste = $2 \times 525 \times \text{R}6,45$ = $\text{R}6\,772,50$ ✓ CA Total Cost / Totale Koste = $\text{R}6\,500 + \text{R}6\,772,50 + \text{R}2\,000$ = $\text{R}15\,272,50$ ✓ CA Not VALID / Nie GELDIG nie ✓ O	1SF correct values 1A simplification 1MCA labour cost 1CA doubling 1CA brick cost 1CA amount 1O verification OR/OF 1SF substitution 1MA doubling 1CA simplification 1CA labour cost 1CA brick cost 1CA amount 1O verification	(7)
4.2.3	✓✓ O To be easily lifted by a fork lift./Om maklik met 'n vurkhyser op te lig word. OR/OF Storage/ loading / transportation are made easier /Berging/ laai / vervoer word vergemaklik. OR/OF It keeps them from breaking / Dit keer dat hulle breek OR/OF It makes counting easier/Dit is makliker om te tel To protect the bricks from damage/ Dit beskerm die stene van beskadiging To keep it tight and compact/ Om die stene stewig en kompak te hou	2O reason	M L4 E (2)
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QUESTION 5 [33 MARKS]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
5.1.1	✓RT Adelaide and/en Melbourne ✓RT	1RT 1 st city 1RT 2 nd city (2)	MP L1 E
* 5.1.2	✓RT ✓RT Aug, Sep, Oct, Nov ✓RT Aug, Sep, Okt, Nov	1RT first correct month 1RT second correct month 1RT ALL correct months (3)	MP L1 M
5.1.3	14 655 – (738 + 1 062 + 922 + 1 705 + 2 850 + 1 871 + 2 811) ✓RT = 14 655 – 11 959 ✓MCA = 2 696 km ✓CA	1RT all correct values 1MCA subtracting 1CA simplification AO (3)	MP L2 M
* 5.1.4	Tasmania./Tasmanië ✓✓RT	2RT correct state (2)	MP L1 E
5.1.5	Distance/Afstand = Speed × time 1 705 km = s × 20 h 40 min ✓SF 1 705 km = s × 20,67 h ✓C Speed/Spoeed = $\frac{1\,705\text{ km}}{20,67\text{ h}}$ ✓S = 82,5 km/h ✓CA	1SF substitution 1C converting to hours 1S change subject of formula 1CA simplification (4)	M L2 M
5.2.1	✓RT 1 142 feet/voet = 348 m ✓RT $1\text{ foot/voet} = \frac{348}{1\,142}$ = 0,304728546 1 foot/voet ≈ 0,305 m ✓A	1RT 1 142 1RT 348 1A 0,305 (3)	M L2 M
* 5.2.2	Uluru : Eiffel Tower : Big Ben/ Uluru : Eiffeltoring : Big Ben 348 : 324 : 96 ✓RT ✓A = 29 : 27 : 8 ✓✓CA	1RT correct values 1A correct order 2CA simplified ratio (4)	M L2 E

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
* 5.3.1	$P = 22,5\% \quad \checkmark\checkmark A$ OR/OF $P = \frac{1\,729\,742}{7\,688\,220} \quad \checkmark\checkmark A$ $= 0,224986... \text{ or } 22,5\%$	2A correct probability (2)	P L2 E
5.3.2	Area of island/<i>Opp van eiland</i> = $\frac{32\,159}{64\,519} \quad \checkmark RT$ OR/OF Half of Tasmania / <i>Halfte van Tasmanië</i> $64\,519 \times \frac{1}{2} = 32\,259,5 \text{ km}^2 \quad \checkmark MA$ Islands / <i>Eilande</i> = $32\,159 \text{ km}^2 \quad \checkmark RT$ OR/OF $64\,519 : 32\,159 \quad \checkmark RT$ $\approx 2 : 1 \quad \checkmark CA$	1RT area of islands 1RT area of Tasmania 1CA simplification OR/OF 1RT Tasmania area 1MA simplification 1RT island area OR/OF 1RT area of islands 1RT area of Tasmania 1CA simplification (3)	MP L4 M
* 5.3.3 (a)	Population density/<i>Bevolkingsdigtheid</i> $= \frac{454\,499}{2\,358} \quad \checkmark RT$ $= 192,74... \quad \checkmark RT$ $\approx 193 \quad \checkmark R$	1RT correct 454 499 1RT correct area 2 358 1R simplification rounded up (3)	M L3 D
* 5.3.3 (b)	Land % area/<i>Land % opp</i> = $\frac{2\,358}{7\,688\,220} \times 100\% \quad \checkmark RT$ $= 0,0306... \% \quad \checkmark CA$ Rounds off to zero/<i>Rond af na nul.</i> $\checkmark O$	1RT correct 2 358 1RT 7 688 220 1CA simplification 1O opinion (4)	M L4 D
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