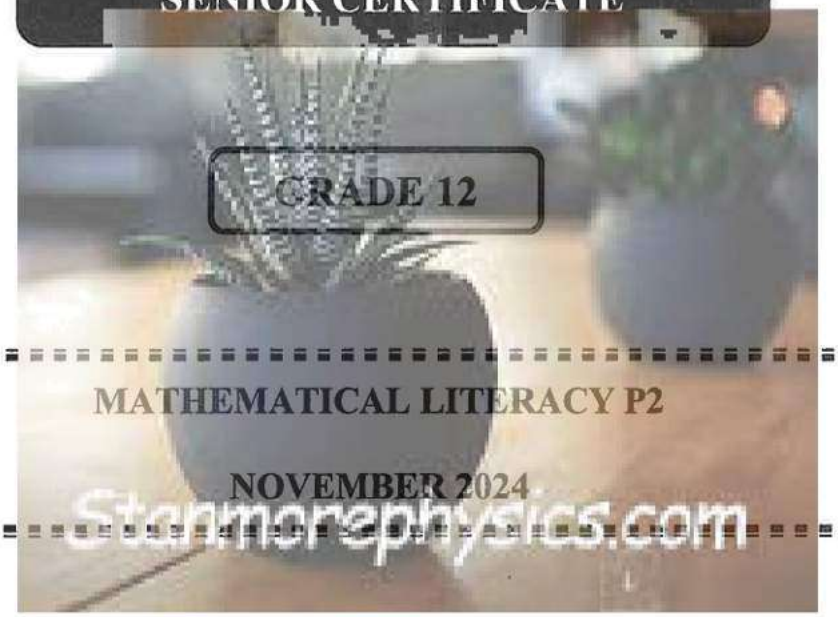
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GRADE 12

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.

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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.

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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.

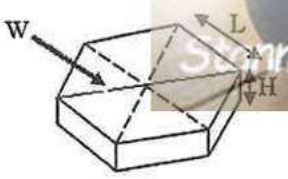
1.1.1 Capacity (2)

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)

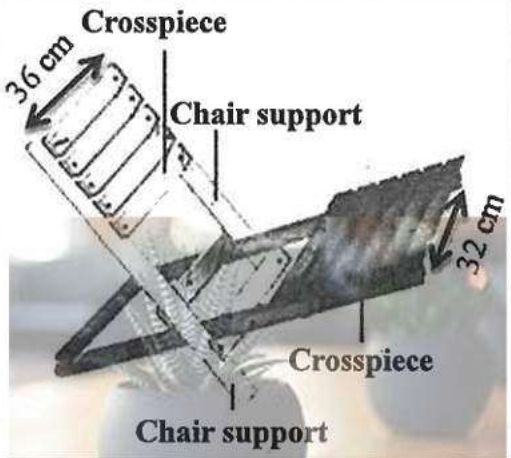
1.2.2 Choose, from the options (**A**, **B** or **C**) below, the correct one that could be used to calculate the volume of the hexagonal paving brick.

A Volume = 6 × area of triangle × height
B Volume = side length + height + width
C Volume = 6 × perimeter × height (2)

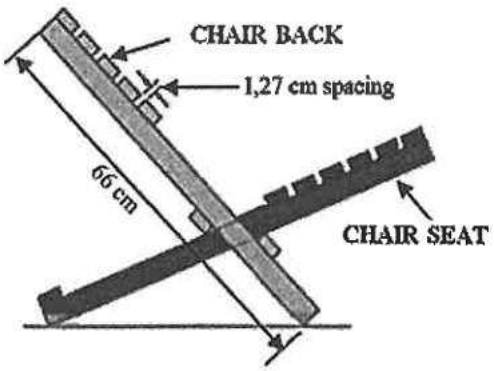
1.2.3 Calculate the number of bricks needed for a single row along a length of 2 860 mm. (3)

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



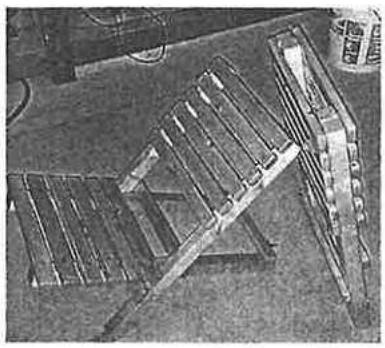
MATERIAL LIST

#	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).

ASSEMBLED CHAIR AND FOLDED-UP CHAIR



[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]

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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)

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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.'

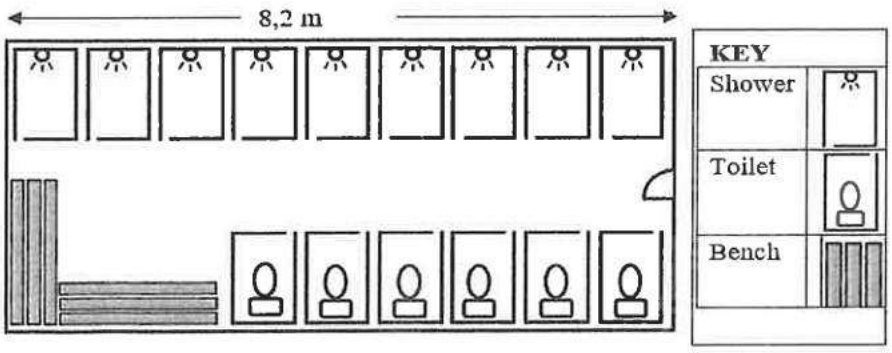
Write down which campsite is being described. Write down only the number of the campsite. (2)

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.

LAYOUT PLAN OF THE ABLUTION FACILITIES



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)

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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.

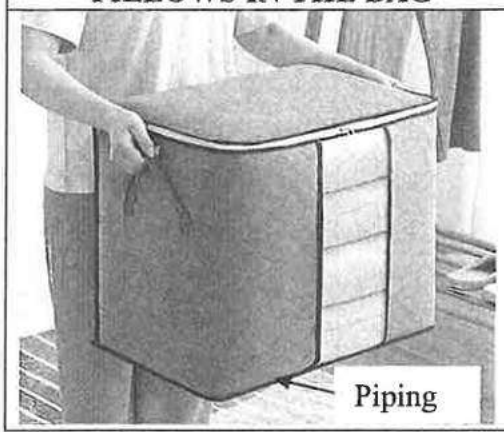
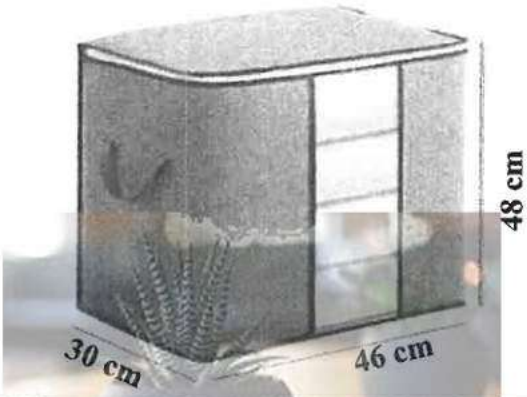
Show, by means of calculations, whether or not he is correct. (3)
[31]

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.

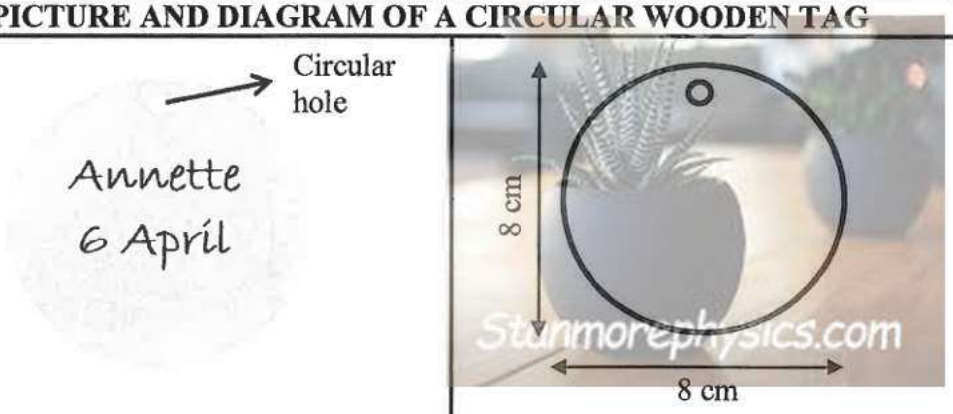
She will write each learner's name and birthday on a small circular wooden tag and attach the tag to the correct month.

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 cm^2.

Every year she paints the front surface area of the circular wooden tags.

The spread rate of the paint is 6 m^2/ℓ.

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:

Circumference of a circle = 3,142 × 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.

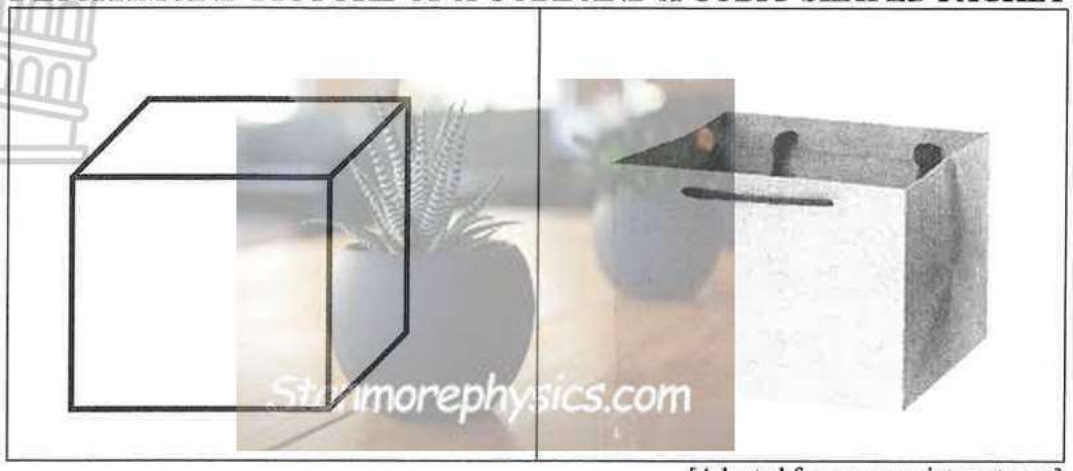
Verify her statement. Show ALL calculations.

Use the following formula:

Area of a circle = 3,142 × 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

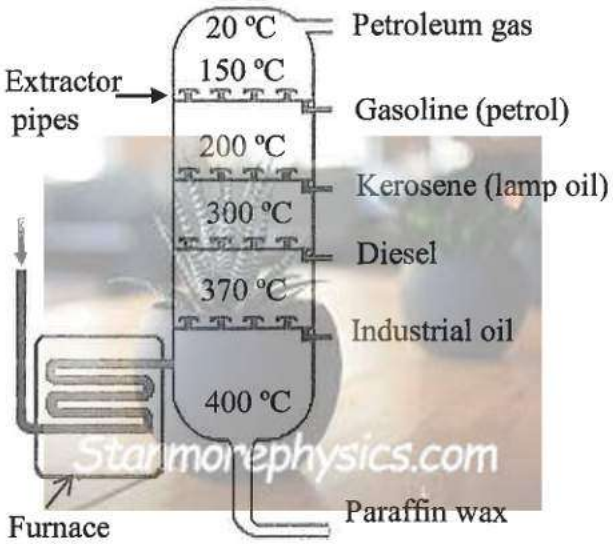
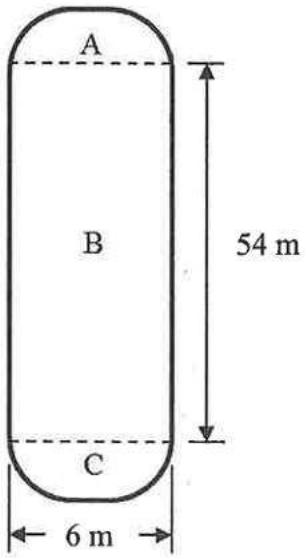


DIAGRAM OF A VERTICAL, CYLINDRICAL TOWER



[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 m^2.

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: $°C = \frac{(°F - 32)}{1,8}$ (4)

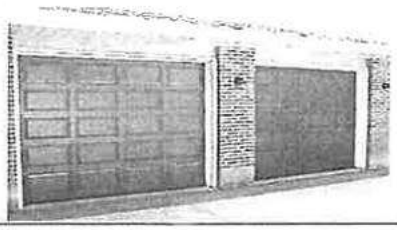
4.1.4 The pipes leading in and out of the vertical, cylindrical tower take up 2,5% of the surface area of part **B** of the cylindrical tower.

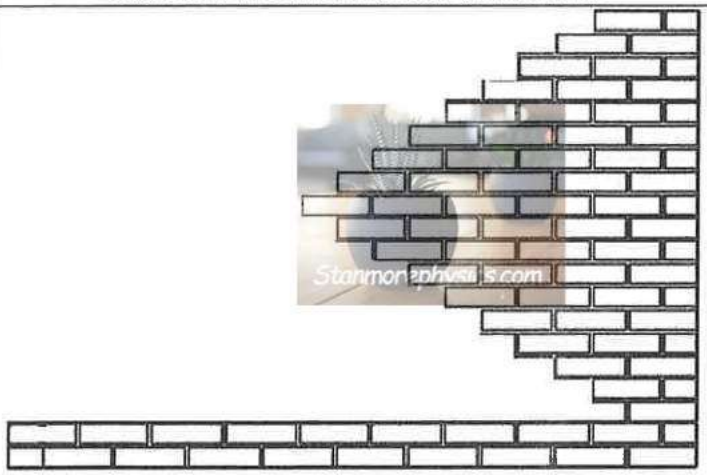
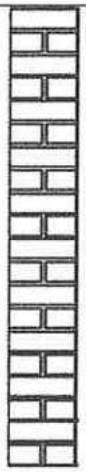
Calculate the total surface area of the vertical, cylindrical tower, excluding the area taken up by the pipes.

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.

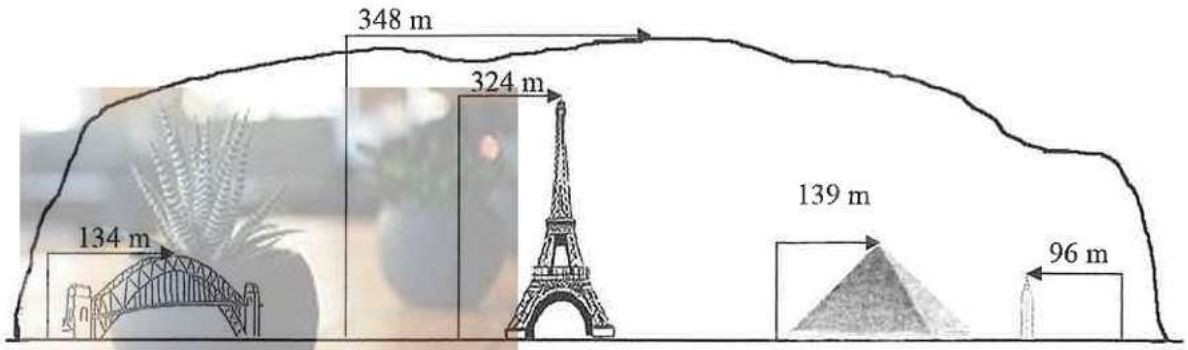
You may use the following formula: **Distance = speed × time** (4)

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.



[Sources: Pinterest.com.au and 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)

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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 km²	ISLAND AREA km²	TOTAL AREA km²	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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GRADE 12

MATHEMATICAL LITERACY P2

ADDENDUM

NOVEMBER 2024



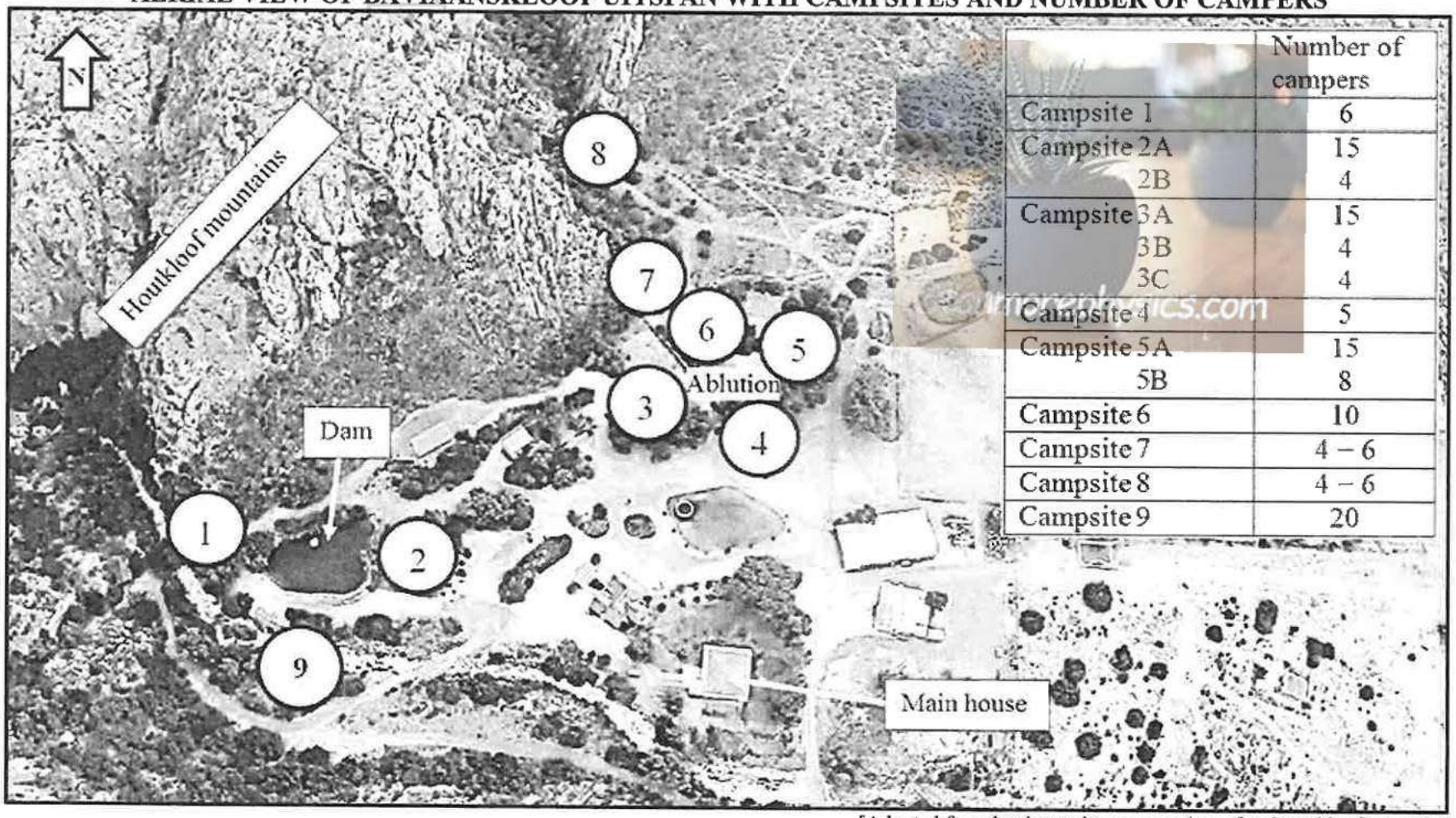
This addendum consists of 4 pages with 3 annexures.

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ANNEXURE A

QUESTION 2.1

AERIAL VIEW OF BAVIAANSKLOOF UITSPAN WITH CAMPSITES AND NUMBER OF CAMPERS



	Number of campers
Campsite 1	6
Campsite 2A	15
2B	4
Campsite 3A	15
3B	4
3C	4
Campsite 4	5
Campsite 5A	15
5B	8
Campsite 6	10
Campsite 7	4 – 6
Campsite 8	4 – 6
Campsite 9	20

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

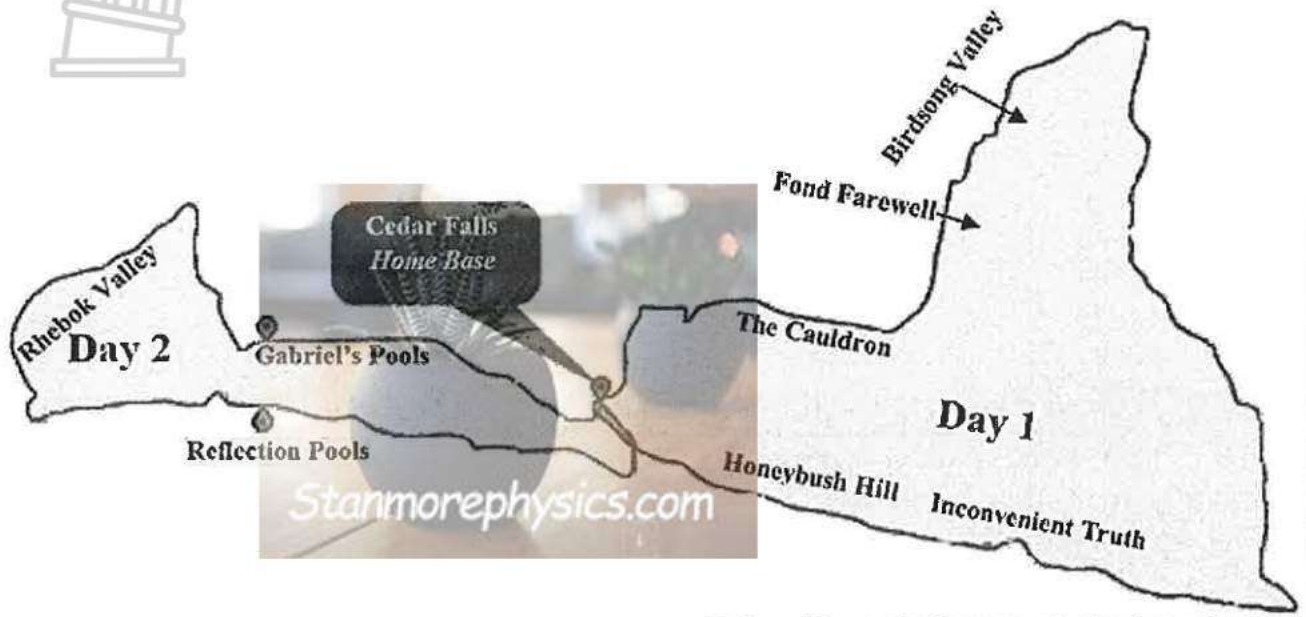
NOTE: The bigger the hut, the more expensive it is.

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ANNEXURE B

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

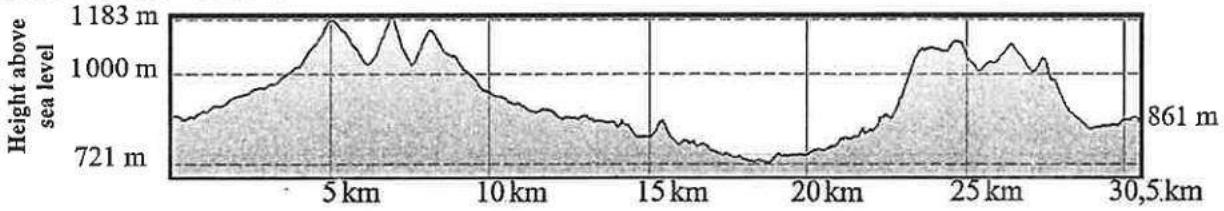
MAP OF THE LEOPARD TRAIL RUN ROUTE



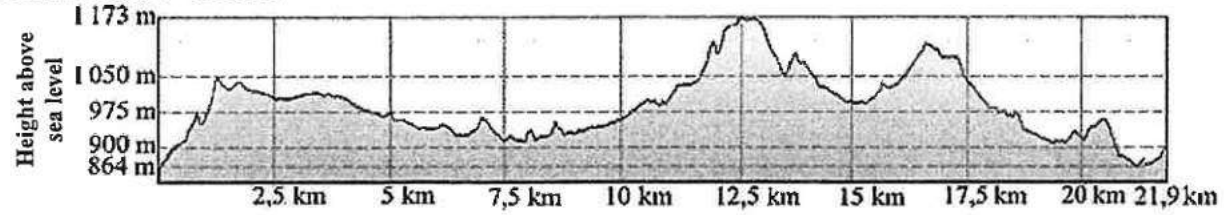
[Adapted from gobaviaans.co.za/project/leopardtrailrun]

ELEVATION MAP OF THE LEOPARD TRAIL RUN ROUTE

TRAIL RUN – DAY 1



TRAIL RUN – DAY 2



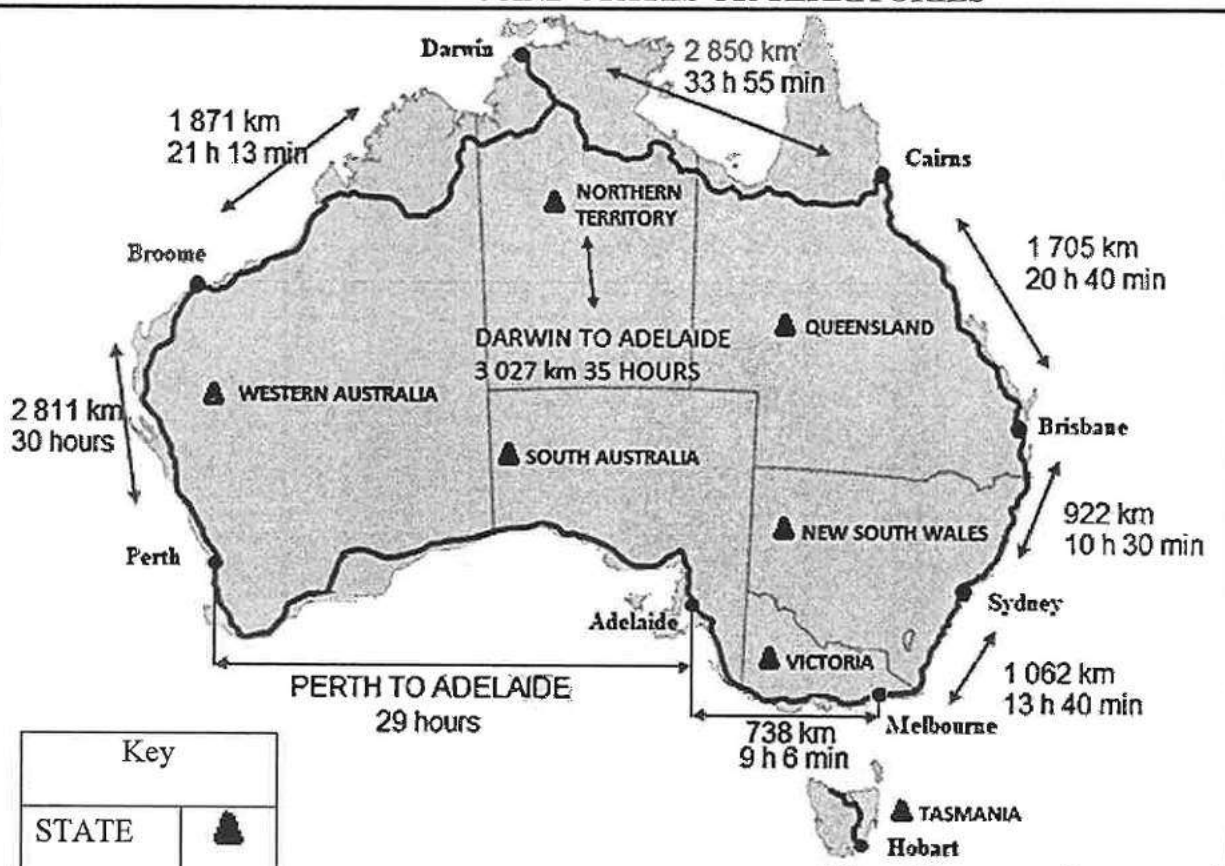
[Adapted from gobaviaans.co.za/project/leopardtrailrun/]

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ANNEXURE C

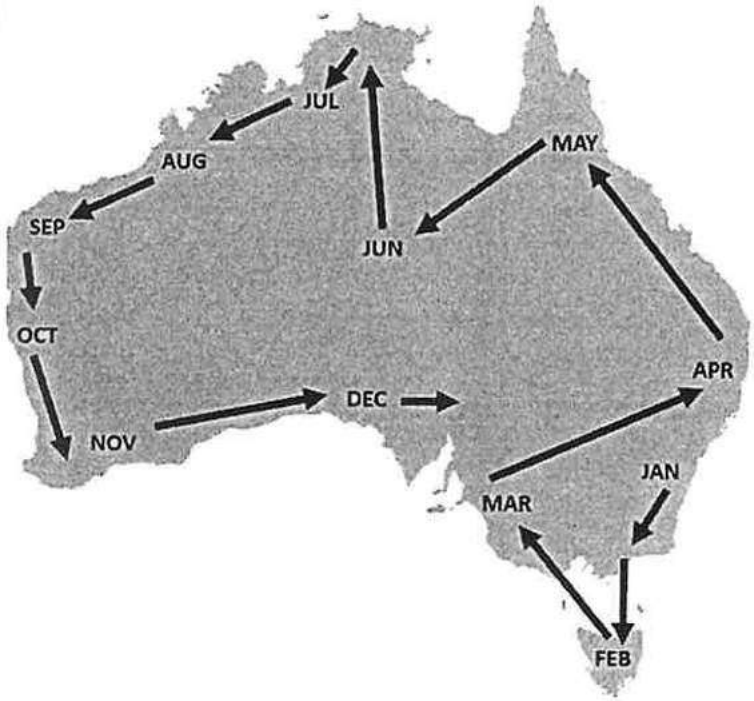
QUESTION 5

MAP OF AUSTRALIA SHOWING THE A1 MOTORWAY, DISTANCES, DRIVING TIMES AND STATES OR TERRITORIES



[Adapted from www.wilmap.com.au]

PLANNED TRIP ALONG THE A1 MOTORWAY AND OTHER ROADS



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