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DEPARTMENT OF EDUCATION
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**PROVINSIALE VOORBEREIDINGSEKSAMEN/
PROVINCIAL PREPARATORY EXAMINATION**

GRAAD/GRADE 12

**WISKUNDIGE GELETTERDHEID V2/
MATHEMATICAL LITERACY P2**

SEPTEMBER 2023

PUNTE/MARKS: 150

TYD/TIME: 3 uur/hours

**Hierdie vraestel bestaan uit 9 bladsye en 'n addendum met 5 bylaes./
This question paper consists of 9 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 1.2
ANNEXURE B for QUESTION 2.1
ANNEXURE C for QUESTION 3
ANNEXURE D for QUESTION 4.1
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

Angel Soft is a brand of Mega toilet rolls. They are called Mega rolls because they have more sheets per roll. TABLE 1 shows the packaging and information regarding these toilet rolls.	
TABLE 1: ADVERTISEMENT OF MEGA TOILET ROLLS	
	Angel Soft Mega Toilet rolls. Two ply toilet rolls Packed: 6×3 Sheets: 320 sheets per roll Roll weight: 33gsm (gram per m^2) Package weight: +/- 6,38 kg per pack 18 Mega toilet rolls = 72 regular rolls Special Price: R392.00
	Dimensions of one toilet roll Width: 100 mm Outside Diameter: 140 mm Thickness: 29 mm Length of a toilet roll 23 500 mm A = Cardboard Centre piece One sheet of paper: 100 mm \times 110 mm

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

Use the information above to answer the questions that follow.

- 1.1.1 Write down the number of rolls per pack. (2)
- 1.1.2 Convert the length of the toilet paper on one roll to metre. (2)
- 1.1.3 Calculate the minimum height, in mm, of the packaged rolls. (2)
- 1.1.4 Write the ratio of the Mega toilet rolls to the regular toilet rolls as a ratio in its simplest form. (2)
- 1.1.5 Determine the diameter (A) of the cardboard centre piece. (2)
- 1.1.6 Calculate the cost per roll. (2)
- 1.1.7 Name the geometrical shape of one sheet of paper. (2)
- 1.1.8 Determine how many sheets will be left on the roll if $\frac{1}{2}$ of the roll was used. (2)

- 1.2 Panel doors always provide a decorative look to homes. ANNEXURE A shows the assembly diagram as well as the completed view of a 6 panel wooden door. All the measurements on the completed view are in centimetres

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

- 1.2.1 Name the piece in the assembly diagram which represents the length of the door. (2)
- 1.2.2 Calculate the values of **A** and **B** in the assembly diagram. (4)
- 1.2.3 Which panels in the completed view are the largest? (2)
- 1.2.4 Write down the number of wooden dowels required to assemble the panel door. (2)
- 1.2.5 Round the width of the bottom rail to a whole number. (2)
- 1.2.6 Calculate the length of wood needed to make all the mullions. (2)
- [30]

QUESTION 2

- 2.1 Mr Kowalski, his wife and 16-year-old child are from South Africa who yearly travels to Poland to attend the Jagiellonian Fair in Lublin.

ANNEXURE B shows a train travel map with the cost in dollars (\$) between the cities as well as the distances between towns. Children younger than 18 years pay 50% less.

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

- 2.1.1 They arrived in a city where the travel costs in any 6 directions to another city are exactly the same. Write down the name of the city. (2)
- 2.1.2 Friends of the Kowalski's lives in Rzepin on the Border between Poland and Germany. In which general direction are Rzepin from Lublin? (2)
- 2.1.3 Calculate how many dollars it will cost the family for a one-way trip from Poznań to Lubin via Toruń. (4)
- 2.1.4 Write down to how many places outside of Poland the family can travel by train. (2)
- 2.1.5 Name the city that has the most train connections to other towns. (2)
- 2.1.6 After the Jagiellonian Fair in Lublin the family travelled to a holiday resort. They took the following directions:
 a) Travel in a north-westerly direction to the nearest town.
 b) Turn in south westerly direction to the nearest town
 c) Travel in a south easterly direction to their destination.
- Identify the city name where the resort is situated. (3)
- 2.1.7 Give a possible reason why between Katowice, Kraków and Oświęcim the cost is only \$5. (2)
- 2.1.8 Two different sources indicated the distance between Kraków and Białystok as follows:
 Source A: 408 km – 254 miles
 Source B: 408 km – 253 miles
- Compare, to 5 decimal places, and decide which source is closest to the conversion rate of 1 mile = 1,60934 km (6)

[23]

QUESTION 3

Ms Harper wanted to enhance her garden by building a fish pond in the centre of her garden. The area surrounding the pond will be decorated by flowers and a gravel walkway.

ANNEXURE C shows a designer concept of how she could construct her project.

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

3.1 Calculate the radius (E) of the pond and its surrounding flower bed. (2)

3.2 The water in the pond is 65°F. Convert it to °C.

You may use the following formula:

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \div 1,8 \quad (2)$$

3.3 The biggest part of the walkway forms a rectangle. Determine the area of this part.

You may use the following formula:

$$\text{Area of a rectangle} = \text{length} \times \text{width} \quad (4)$$

3.4 Calculate the number of the bricks she will be needing to construct the outer wall of the fish pond if the volume of one brick is 0,0024 m³.

You may use the following formula

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

3.5 Ms Harper wants to plant flowers on the flower bed surrounding the fish pond. Calculate the area that will be covered in compost.

You may use the following formula:

$$\text{Area} = 3,142 \times \text{radius}^2 \quad (5)$$

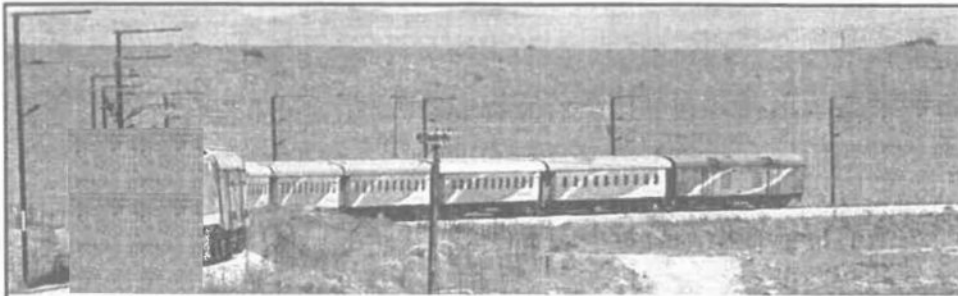
3.6 The pond is filled to 80% of the volume. Ms Harper stated that it will take less than 1 hour to fill the pond if the flowrate of the water is 39,6 litres per minute. Show by means of calculations if she is correct if 1 m³ = 1 000 litre. (7)

3.7 Mr Harper stated that he will need less than 70 bricks to put along the 3 sides of the walkway that connects to the circular flower bed. Verify showing ALL calculations if he is correct if the length of a standard brick is 230 mm. (7)

[35]

QUESTION 4

4.1



The Cloete family lives in Van Rhynsdorp and consist of 2 adults and two children. They decided to travel to Pretoria on the Shosholoza Meyl to visit relatives during January. The Shosholoza Meyl is a train that travels once a week from Johannesburg to Cape town.

ANNEXURE D shows the travel times and cost for the Shosholoza Meyl. The Shosholoza Meyl consist of 1 locomotive, 1 restaurant car, 6 passenger carriages and 1 goods car.

[Adapted from www.shosholoza-meyl.co.za]

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

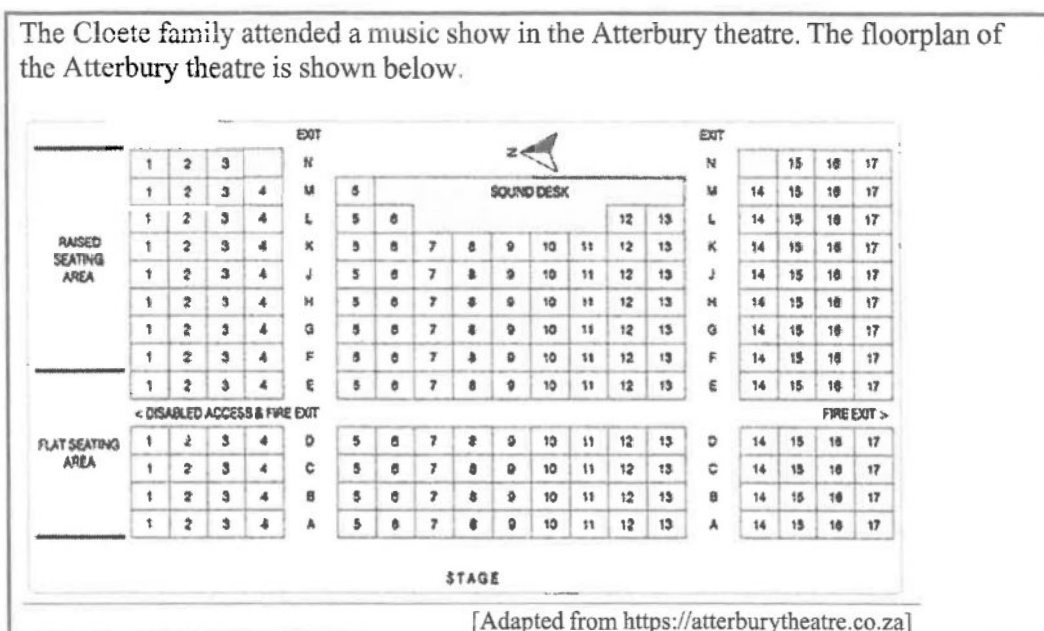
- 4.1.1 On which day does the train leave Cape town station? (2)
- 4.1.2 The train left Johannesburg station on the 24th of Augustus 2023. Write down the date and time it will be arriving at Beaufort West. (2)
- 4.1.3 The stopping time of the train in Kimberley is the same for both directions the train travels in. Calculate the departure time of A in the table. (3)
- 4.1.4 Calculate the difference between the time taken from Cape town to Beaufort West compared to from Beaufort West to Cape town. (4)
- 4.1.5 Write down the probability, as a fraction, that in one of the carriages they will be serving food during the trip. (2)
- 4.1.6 Calculate how much money the family could have saved if they decided to travel during the month February (4)
- 4.1.7 The Cloete family wants to be at the station 1 hour before the departure time. At which time should the family start driving to Cape town if the kilometre distance between the 2 towns are 304 km and Mr Cloete maintain an average speed of 110 km/h without stopping anywhere.

You may use the following formula.

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} \quad (5)$$

- 4.1.8 On their return trip Mrs Cloete stated that the train is travelling at an average speed of more than 70 km/h since the distance between Johannesburg and Kimberley is 556 km. Verify by showing all calculations whether she is correct. (5)

- 4.2 The Cloete family attended a music show in the Atterbury theatre. The floorplan of the Atterbury theatre is shown below.



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

- 4.2.1 How many people can be accommodated inside the Atterbury theatre? (2)
- 4.2.2 Explain the meaning of the term floorplan. (2)
- 4.2.3 Mr Cloete is seated in the J row on the first seat from the North wall. His friend Susan is seated in the second row from the stage on the fourth seat from the south wall. Describe the shortest directions that Mr Cloete should take to get to his friend if he stood up and turned left. (4)
- 4.2.4 Calculate the probability, as a percentage, to be seated the furthest from the stage next to the eastern wall. (3)


[38]

QUESTION 5

Candice wants to build a house and received a drawn plan from a local architect. ANNEXURE E shows the floor plan and elevation of one side of the house. The thickness of all the walls is 129 mm. All measurements on the plan are in millimetres.

A foldable glass door consists out of three glass panels mounted in an aluminium doorframe. TABLE 3 shows the advertisement of paint as advertised in a local hardware store.

TABLE 3 ADVERTISEMENT OF PAINT

	<p>1 ℓ cost R99,00 2,5 ℓ cost R230,00 5 ℓ cost R399,00</p> <p>Spread rate of paint: 1 ℓ covers 5,6 m²</p>
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[Adapted from <https://www.buildit.co.za>]

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

- 5.1 Write down the **letter** of the biggest bedroom in this house. (2)
- 5.2 Referring to **compass directions**, which elevation of the house is represented by K? (2)
- 5.3 How **many** foldable doors are shown on the plan? (2)
- 5.4 Calculate the length of L. (3)
- 5.5 Measure the width of the stoep and calculate the scale of this house plan. Round your answer to the nearest 100. (5)
- 5.6 Candice wants to paint one of the wooden doors. Write down, as a decimal fraction the probability that it is not the exterior door. (3)
- 5.7 The stoep needs to be painted with a double coat of paint. Calculate the most economical way to buy the paint needed to paint the floor if the spread rate of the paint is 1 ℓ for 5,6 m². (7)

[24]

TOTAL: 150