GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2023

10602

MATHEMATICAL LITERACY

(PAPER 2)

TIME: 3 hours

MARKS: 150

9 pages + an addendum of 6 pages

MATHEMATICAL LITERACY: Paper 2

10602E

X05

This question paper consists of 9 pages.
A 6-page addendum is included as an insert in this question paper.

P.T.O.

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 1.3
   ANNEXURE B for QUESTION 2.1
   ANNEXURE C for QUESTION 4.1
   ANNEXURE D for QUESTION 5.1
   ANNEXURE E for QUESTION 5.2

3. Number your 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 The images below represent measuring instruments used to measure mass and volume. Study the images below and answer the questions that follow.

A	B
	
C	**D**
	

Match the descriptions below with the images above. Write down only the correct letter (A – D).

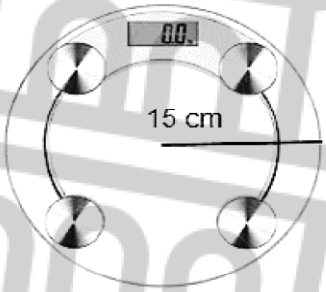
1.1.1 An instrument used to measure the mass of meat in a butchery. (2)

1.1.2 An instrument used to measure the mass of different food types in the kitchen. (2)

1.1.3 An instrument used to measure liquids. (2)

1.1.4 An instrument used to measure the mass/weight of a person. (2)

1.2 Bathroom scales may be used to monitor one's BMI. Lesley bought a bathroom scale with a radius of 15 cm.



1.2.1 Define the term *radius*. (2)

1.2.2 Determine the diameter of the bathroom scale. (2)

1.2.3 Convert 15 cm to metres. (2)

1.2.4 Lesley measured his height and the reading is 66,929 inches.

Determine his height in metres.

Use: **1 m = 39,37 inches** (2)

1.2.5 Choose the letter of the answer that will complete the following statement correctly.

The unit used to measure BMI is …

A kg^2/m
B kg/m^2
C $(kg/m)^2$ (2)

1.3 Lesley downloaded a seating plan of an airplane to check the seat that he reserved for a trip. Use the information in ANNEXURE A to answer the following questions.

1.3.1 Lesley's ticket indicates that he was allocated the 6^{th} seat in the east. Identify the seat. (2)

1.3.2 Use cardinal points to determine where the toilet is situated from Lesley's seat. (2)

1.3.3 How many seats are there on the plane? (2)

1.3.4 Determine the number of single seats from this plan. (2)

1.3.5 What is the general direction of seat 12A from seat 6F? (2)

1.3.6 Express as a ratio, the number of double seats to the total number of seats. (2)

[30]

QUESTION 2

Thandi lives in George, and she travels to Port Elizabeth. She uses the map in ANNEXURE B to plan her local trips. Study the map and answer the questions that follow.

2.1 What type of map does Thandi use in ANNEXURE B? (2)

2.2 Which is the last city that she will pass before she reaches Port Elizabeth when travelling on the N2? (2)

2.3 Name TWO regional roads that she will pass between George and Port Elizabeth, when travelling on the N2. (2)

2.4 What is the distance between George and Port Elizabeth? (2)

2.5 Thandi left George at 05:30 and reached Port Elizabeth at 08:25. Determine the time, in hours, taken to reach Port Elizabeth. (3)

2.6 Hence, determine the average speed at which she travelled in km/h. Round-off your answer to the nearest whole number.

You may use the formula: **Distance = Average speed × Time** (4)

2.7 Thandi claims that the shortest route from Worcester to Mossel Bay is by the national roads instead of the regional roads. Verify, with calculations, whether or not her claim is valid. (10)

2.8 Give ONE advantage of using this type of map. (2)

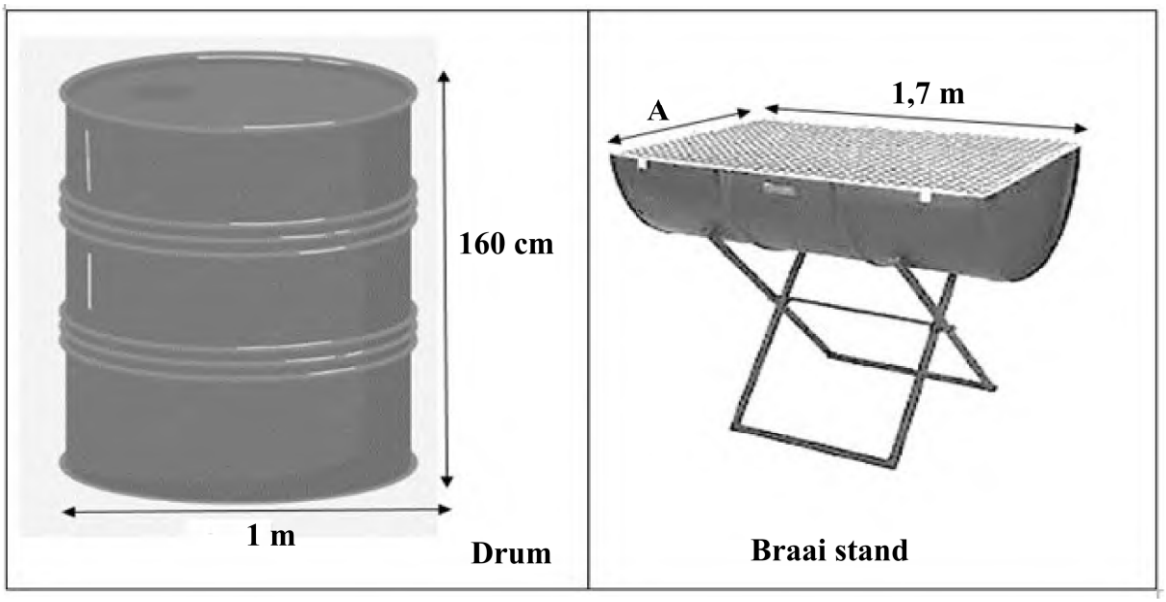
[27]

QUESTION 3

Thato is preparing for a picnic. He cut a drum into two pieces to design a braai stand as shown below.

- The diameter of the drum is 1 m, and the height of the drum is 160 cm.
- The top of the braai stand will be a rectangular grille with the dimensions **A** and 1,7 m.
- The width of the braai stand top is similar to the diameter.
- The braai stand will be half-filled with concrete mix.

Study the diagrams below together with the information above, and answer the questions that follow.



3.1 What is the value of **A**? (2)

3.2 Calculate the area of the top of the braai stand and round-off your answer to the nearest whole number.

You may use the formula: **Area = Length × Breadth** (3)

3.3 Use calculations to show that the length of the top extends by 0,05 m on each side. (7)

3.4 Hence, determine the capacity of the drum.

You may use the formula: **Capacity = $\pi r^2 h$; where π= 3,142** (5)

3.5 Determine the volume of the braai stand that will be half-filled with the concrete mix. (6)

PLEASE DETACH THIS 6-PAGE ADDENDUM.

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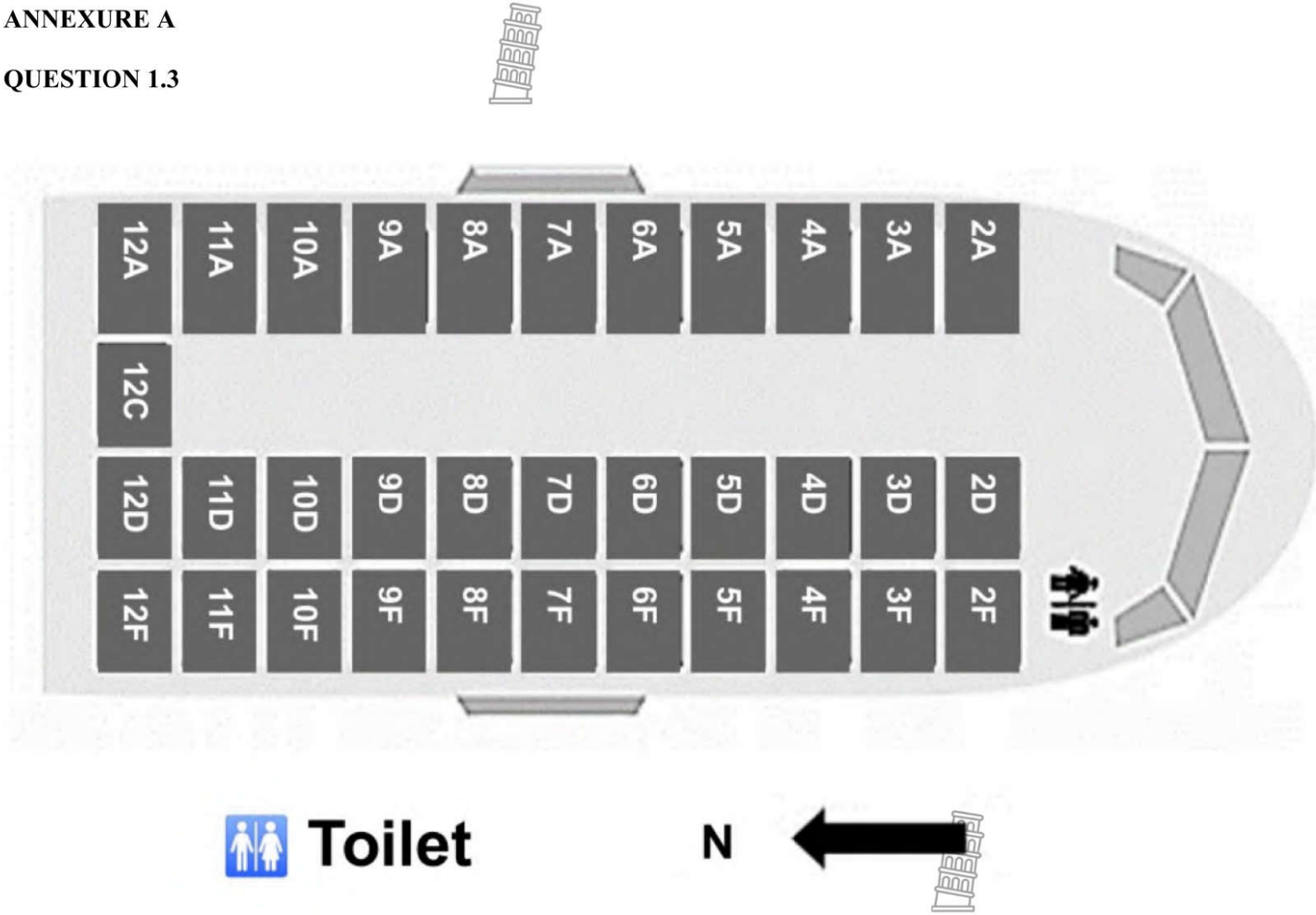
MATHEMATICAL LITERACY
(PAPER 2)

ADDENDUM

6 pages

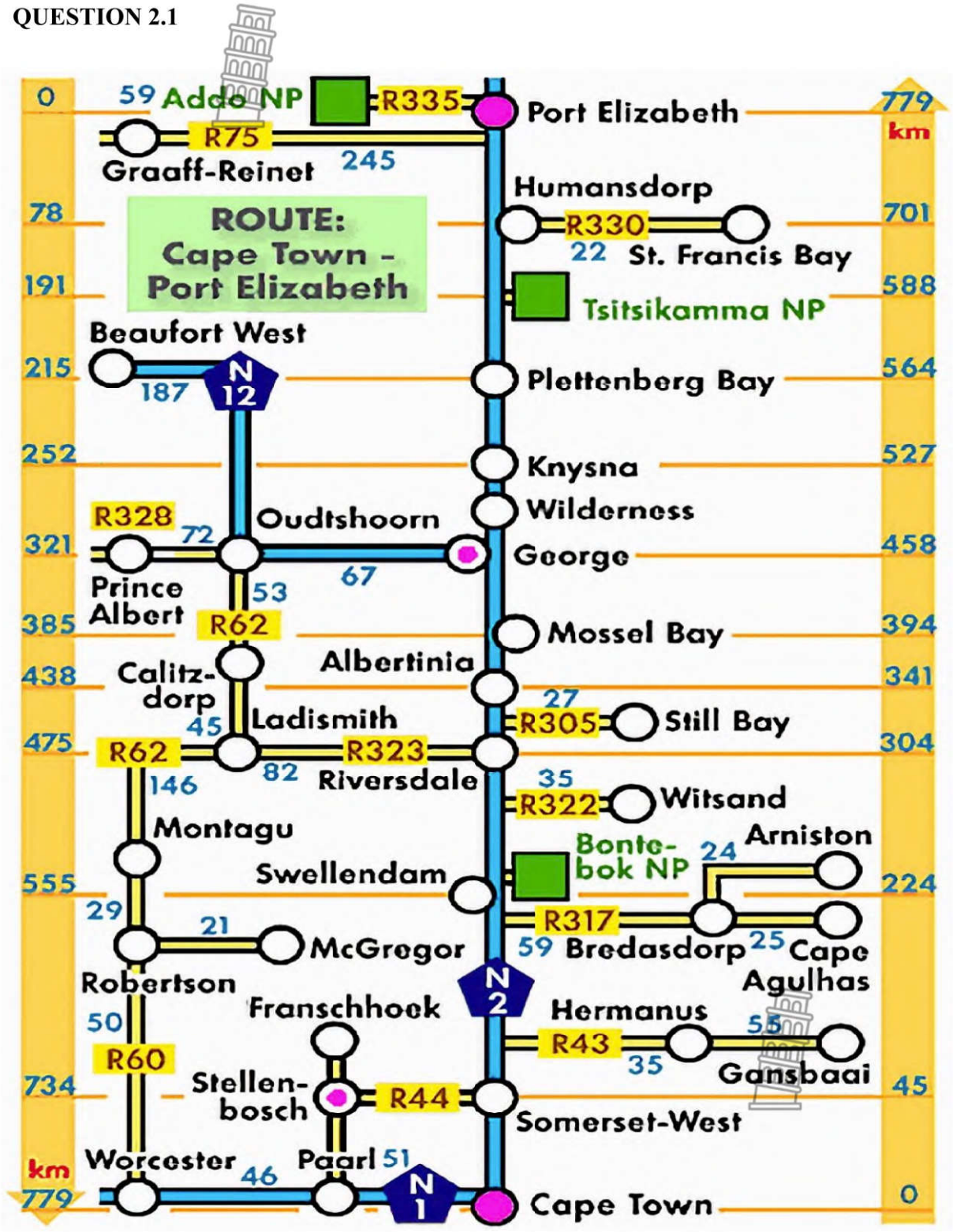
ANNEXURE A

QUESTION 1.3



ANNEXURE B

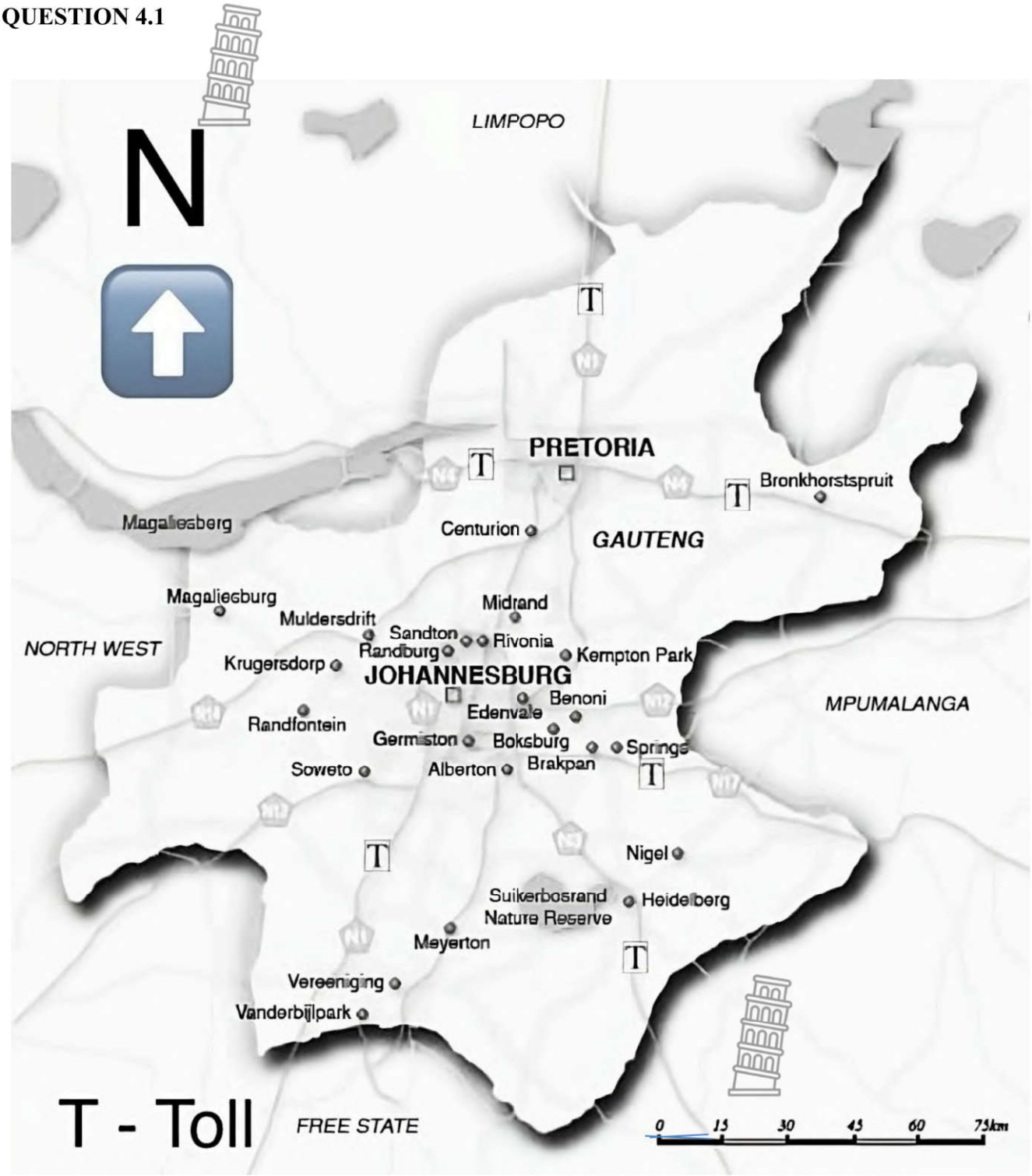
QUESTION 2.1



P.T.O.

ANNEXURE C

QUESTION 4.1



ANNEXURE D

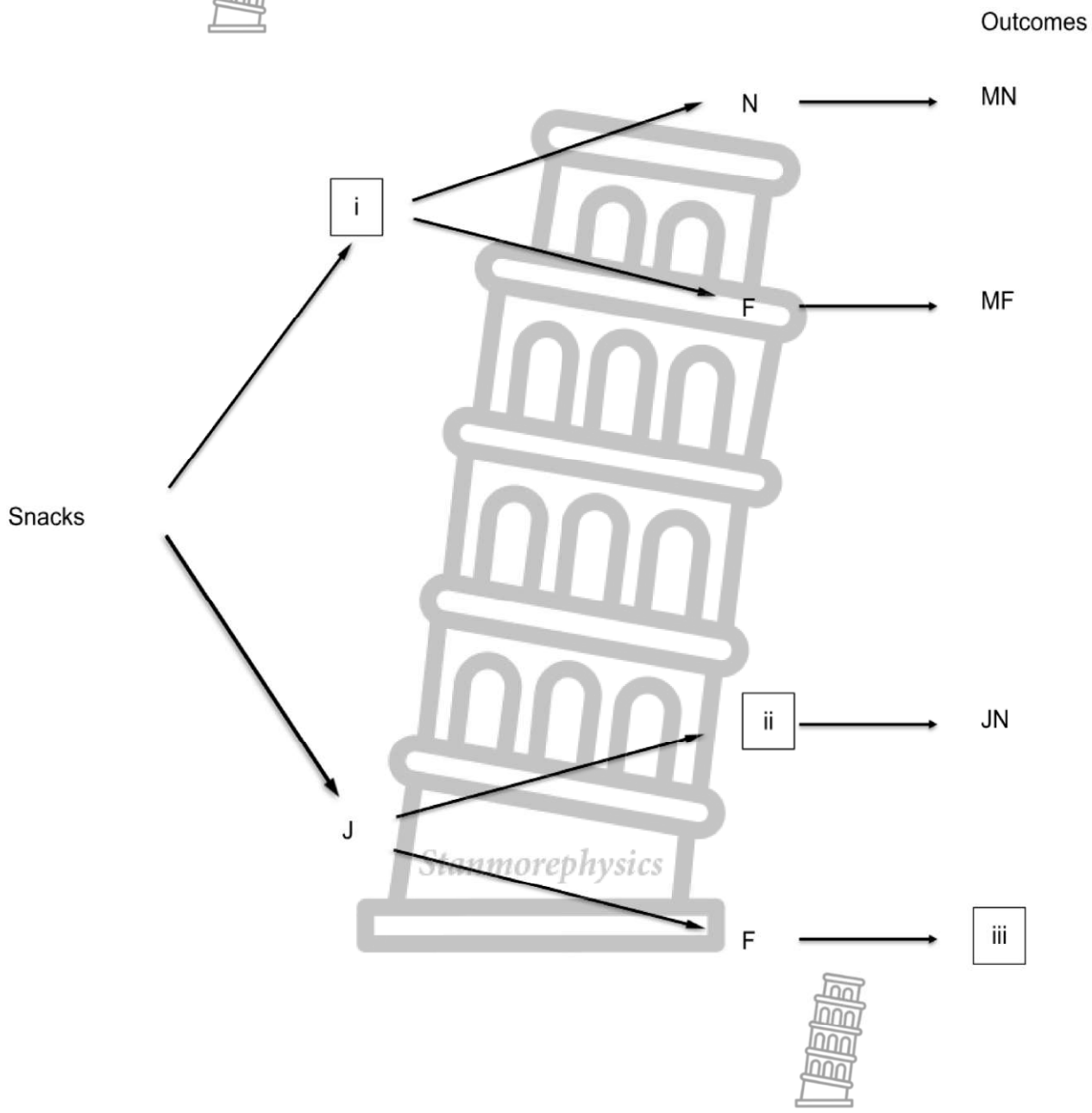
QUESTION 5.1

NORTHBOUND							
Depart	Depart	Depart	Depart	Depart	Depart	Depart	Arrive
Park Station	Rosebank	Sandton	Marlboro	Midrand	Centurion	Pretoria	Hatfield
06:45	06:49	06:53	06:57	07:04	07:13	07:23	07:30
07:00	07:04	07:08	07:12	07:19	07:28	07:38	07:45
07:15	07:19	07:23	07:27	07:34	07:43	07:53	08:00
07:30	07:34	07:38	07:42	07:49	07:58	08:08	08:15
07:45	07:49	07:53	07:57	08:04	08:13	08:23	08:30
08:00	08:04	08:08	08:12	08:19	08:28	08:38	08:45

SOUTHBOUND							
Depart	Depart	Depart	Depart	Depart	Depart	Depart	Arrive
Hatfield	Pretoria	Centurion	Midrand	Marlboro	Sandton	Rosebank	Park Station
06:38	06:48	06:55	07:04	07:10	07:15	07:19	07:23
06:53	07:03	07:10	07:19	07:25	07:30	07:34	07:38
07:08	07:18	07:25	07:34	07:40	07:45	07:49	07:53
07:23	07:33	07:40	07:49	07:55	08:00	08:04	08:08
07:38	07:48	07:55	08:04	08:10	08:15	08:19	08:23
07:53	08:03	08:10	08:19	08:25	08:30	08:34	08:38

ANNEXURE E

QUESTION 5.2



END

3.6 The concrete mix is sold strictly in wheelbarrows at a local hardware store.

Take note of the following:

- 1 m^3 = 20 wheelbarrows.
- The cost of 1 m^3 of concrete mix is R1 800.

Use calculations to determine whether the cost of the concrete mix needed to half-fill the braai stand will be less or more than R300. (9)

[32]

QUESTION 4

4.1 Tshepo is planning to travel from Centurion to visit his family in Soweto. He studies a map as he is a new driver. Study the map in ANNEXURE C and answer the following questions.

4.1.1 Name the type of scale that is used in the map. (2)

4.1.2 Name the neighbouring provinces found on the eastern and western sides of Gauteng. (2)

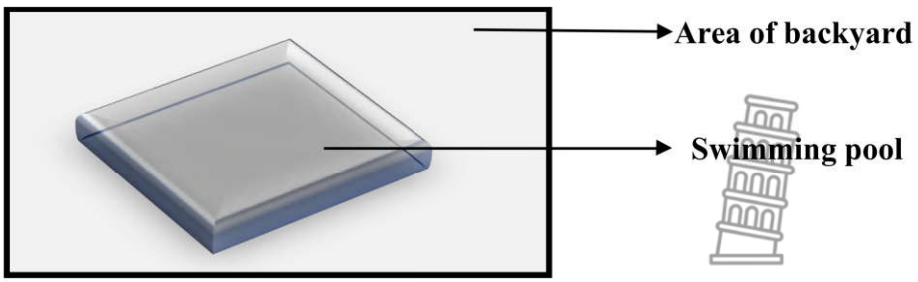
4.1.3 Use the given scale to calculate the actual distance between Centurion and Soweto. Round-off your answer to the nearest kilometre. (6)

4.1.4 Hence, determine the number of litres of petrol required to cover the return trip if the consumption rate of Tshepo's car is 0,086 ℓ/km. (5)

4.1.5 What is the probability of finding a toll gate in the south eastern side of Johannesburg? Express your answer as a percentage. (3)

4.2 Tshepo decided to pave the swimming pool area of his family home in Soweto.

- The shape of the swimming pool is square with each side = 9,84252 ft
- 1 ft = 0,3048 m
- The area of the backyard where the swimming pool is situated is 7 m by 5 m.



4.2.1 Convert the side of the swimming pool to metres. (2)

4.2.2 Hence, determine the perimeter of the swimming pool in metres.

You may use the formula: **Perimeter = 4 × side** (2)

4.2.3 The swimming pool is usually not filled to the top. What could be a possible reason for this? (2)

4.2.4 Explain the difference between *capacity* and *volume* in this context. (4)

4.2.5 Determine in m^2, the area of the backyard that will NOT be paved.

You may use the formulae: **Area of square = side × side**
Area of rectangle = length × width (7)
[35]

QUESTION 5

5.1 Sipho lives in Pretoria and travels daily to his workplace in Rosebank using the Gautrain.

- His reporting time (starting time) is 08:00 every day.
- He walks for 10 minutes to his workplace in Rosebank.

Study the Gautrain timetable in ANNEXURE D and answer the following questions.

5.1.1 Which train (southbound or northbound) must he take in the morning to work? Explain your answer. (2)

5.1.2 What is the LATEST that he should depart from Pretoria if he wants to be at work on time? (2)

5.1.3 Calculate the duration of Sipho's journey to work, including the walking time. (3)

5.1.4 Give TWO advantages of using the Gautrain. (4)

5.1.5 The average temperature in Pretoria in December is 30 °C. Convert this temperature to °F.

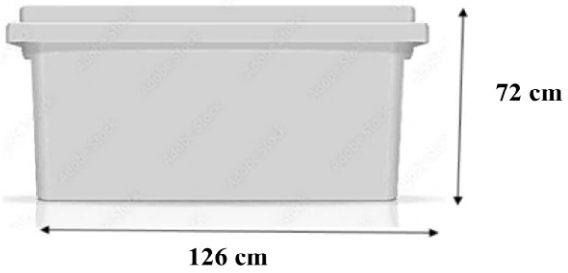
You may use the formula: **°F = (1,8 × °C) + 32°** (2)

5.2 Sipho decided to change his lifestyle and eat healthy meals only. He decided to drink milk (M) or juice (J) and eat nuts (N) or fruit (F) during tea breaks. He used a tree diagram to explore the possible options of snacks.

Study the tree diagram in ANNEXURE E and complete it by writing the correct letter next to **(i) – (iii)** in your ANSWER BOOK (6)

5.3 Sipho bought canned fruit and he must pack the cans in a plastic container. The dimensions of a can and the container are as follows:

Can	Plastic container
Diameter: 6 cm Height: 12 cm	Length: 126 cm Height = 72 cm Width = 53 cm



Tumelo advised Sipho to pack the cans upright so that he can pack 1 134 cans in the container. Verify his claim. (7)

[26]

TOTAL: 150

END

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MARKING GUIDELINES

MATHEMATICAL LITERACY (PAPER 2) (10602)

7 pages

CODES	EXPLANATION
M	Method
MA	Method with Accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
D	Define
J	Justification/Reason/Explain
S	Simplification
RT/RD/RG	Reading from a table/graph/diagram/map/plan
F	Choosing the correct formula
SF	Correct substitution in a formula
O	Opinion
P	Penalty, e.g. for no units, incorrect rounding-off, etc.
R	Rounding-off
NP	No penalty for rounding-off/omitting units

KEY TO TOPIC SYMBOL:

M = Measurement; MP = Maps, Plans and other representations; P = Probability

QUESTION 1

Q		Answer (AO full marks)	Explanation	Level
1.1	1.1.1	C ✓✓ **A**	2A correct answer (2)	M1
	1.1.2	B ✓✓ **A**	2A correct answer (2)	M1
	1.1.3	D ✓✓ **A**	2A correct answer (2)	M1
	1.1.4	A ✓✓ **A**	2A correct answer (2)	M1
1.2	1.2.1	A line drawn from the centre of the circle to the circumference of the circle.✓✓ **A**	2A correct answer (2)	M1
	1.2.2	15 cm × 2 ✓ **M** = 30 cm ✓ **A**	1M multiplying by 2 1A correct answer (2)	M1
	1.2.3	15 cm ÷ 100 ✓ **M** = 0,15 m ✓ **A**	1M dividing by 100 1A correct answer (2)	M1
	1.2.4	$\frac{66{,}929 \times 1\ m}{39{,}37}$ ✓ **MA** = 1,7 m ✓ **A**	1MA 1A correct answer (2)	M1
	1.2.5	**B** ✓✓ **A**	2A correct answer **Accept** **kg/m²** (2)	M1
1.3	1.3.1	7A ✓✓ **A**	2A correct answer (2)	MP1
	1.3.2	South West ✓✓ **A** **OR** SW ✓✓ **A**	**CA from 1.3.1** 2A correct answer (2)	MP1
	1.3.3	34 ✓✓ **A**	2A correct answer (2)	MP1
	1.3.4	12 ✓✓ **A**	2A correct answer **Accept 10** (2)	MP1
	1.3.5	NE/North East ✓✓ **A**	2A correct answer (2)	MP1
	1.3.6	✓**RT** 11: 34 ✓ **A**	**CA from 1.3.3** 1RT 1A correct order **Accept** **12:34** (2)	MP1
			[30]	

QUESTION 2

Q	Answer	Explanation	Level
2.1	Strip chart /Strip map✓✓ **A**	2A correct answer (2)	MP1
2.2	Humansdorp ✓✓ **A**	2A correct answer (2)	MP1
2.3	R330 ✓ **RT** R75 ✓ **RT**	1RT correct value 1RT correct value **Accept R328** (2)	MP1
2.4	779 – 458 ✓ **RT** = 321 km ✓ **CA** **OR** 321 km ✓✓ **RT**	1RT correct values 1CA correct answer 2RT correct answer (2)	MP2
2.5	08:25 – 05:30 ✓ **MA** = 2 hours and 55 min ✓ **A** = 2,917 h ✓ **C**	1MA 1A correct value 1C conversion to hours **AO Full marks** **Accept 2,92h** (3)	MP2/3
		CA from 2.4 and 2.5	
2.6	Average speed = $\frac{Distance}{Time}$ ✓ **M** = $\frac{321\ km}{2{,}917\ h}$ ✓ MA = 110,04 km/h ✓ **CA** ≈ 110 km/h ✓ **R**	1M subject of the formula 1MA numerator and denominator 1CA 1R rounding to the nearest whole number **NPU** (4)	MP3
2.7	**Travelling on National Roads** ✓ **RT** ✓ **RT** 46 + 51 + 394 ✓ **MA** = 491 km ✓ **CA** **OR** 46 + 51 + (779 – 385) = 491 km **Travelling on Regional Roads** ✓ **RT** ✓ **MA** ✓ **RT** 50 + 29 + 146 + 82 + (475 – 385) = 397 km ✓ **CA** **OR**	1RT reading correct values 1RT for 394 km 1MA for adding all the values 1CA answer 1RT reading correct values 1RT for 475 – 385 1MA for adding all the values 1CA answer	MP4

	50 + 29 + 146 + 82 + (394 – 304) = 397 km Travelling on regional roads is shorter than travelling on national roads. ✓ **J** ∴ Her statement is invalid. ✓ **O**	1 J Justification 1O opinion (10)	
2.8	• Possible route with distances are shown. ✓✓ **O** **OR** • Step-by-step directions are given. **OR** • It shows the national and regional roads which may have less traffic.	2O for correct answer (2)	MP4
		[27]	

QUESTION 3

Q	Answer	Explanation	Level
3.1	1 m ✓✓ **A**	2A correct value (2)	M1
		CA from 3.1	
3.2	A = 1 m × 1,7 m ✓ **MA** = 1,7 m^2 ✓ **A** = 2 m^2 ✓ **R**	1MA 1A correct answer 1R correct rounding **NPU** (3)	M2
3.3	Height of drum = $\frac{160\ cm}{100}$ ✓ **C** = 1,6 m ✓ **A** Length of braai stand – height of drum ✓ **RT** ✓**MCA** = 1,7 m – 1,6 m = 0,1 m ✓ **A** ✓**CA** Overlapping material = $\frac{0,1\ m}{2}$✓ **MA** = 0,05 m	1C dividing by 100 1A correct answer 1RT for 1,7m 1MCA subtracting correct values 1A correct answer 1CA numerator 1MA dividing by 2 (7)	M3

3.4	Radius $= \frac{1\,m}{2}$ ✓ **M** $= 0{,}5$ m ✓ **A** Capacity $= 3{,}142 \times 0{,}5^2 \times 1{,}6$ ✓ **SF** ✓ **CA** $= 1{,}2568$ m^3 ✓ **A** **OR** Capacity $= 3{,}142 \times 50^2 \times 160$ ✓ **SF** ✓ **CA** $= 1\,256\,800$ cm^3 ✓ **A**	**CA the height from 3.3** 1M dividing by 2 1A correct answer 1SF substituting correct values 1CA answer 1A correct unit **NPR** (5)	M2

		CA from 3.4	
3.5	Volume of braai stand $= \frac{1{,}2568}{2}$ ✓ **A** ✓ **M** $= 0{,}6284$ m^3 ✓ **A** Volume to be filled with concrete mix $= \frac{0{,}6284}{2}$ ✓**A** ✓**M** $= 0{,}3142$ m^3 ✓ **CA** **OR** Volume of braai stand $= \frac{1\,256\,800}{2}$ ✓**A** ✓**M** $= 628\,400$ cm^3 ✓ **A** Volume to be filled with concrete mix $= \frac{628\,400}{2}$ ✓**A** ✓**M** $= 314\,200$ cm^3 ✓ **CA**	1A numerator 1M dividing by 2 1A correct answer 1A numerator 1M dividing by 2 1CA answer **NPR** **NPU** (6)	M3
		CA from 3.5	
3.6	Volume of 1-wheel barrow $= \frac{1}{20}$ ✓ **MA** $= 0{,}05$ m^3 ✓ **A** Number of wheelbarrows $= \frac{0{,}3142}{0{,}05}$ ✓**A** ✓**A** $= 6{,}284$ ✓ **A** ≈ 7 ✓ **R** Cost $= \frac{R1\,800 \times 7}{20}$ ✓ **MA** $=$ R630,00 ✓ **CA** ∴ It will be more than R300 ✓ **O**	1MA dividing 1 by 20 1A correct answer 1A numerator 1A denominator 1 A correct answer 1R correct rounding 1MA for multiplying and dividing 1CA answer 1O conclusion (9)	M4
		[32]	

QUESTION 4				
Q		**Answer**	**Explanation**	**Level**
4.1	4.1.1	Bar scale/Line scale ✓✓ **A**	2A correct answer (2)	MP1
	4.1.2	Mpumalanga ✓ **A** North West ✓ **A**	1A correct answer 1A correct answer (2)	MP1
	4.1.3	Map length = 5,1 cm ✓ **A** Bar length =1,1 cm ✓ **A** Actual distance = $\frac{5{,}1\ cm}{1{,}1\ cm}$ ✓ **MCA** × 15 km ✓ **MA** = 69,54 km ✓ **CA** ≈ 70 km ✓ **R**	1A map length 1A measured bar length meet 1MCA dividing correct values 1MA multiplying by 15 1CA answer 1R correct rounding **Accept:** **Map length [4,8 cm - 5,5 cm]** **Bar length [1 cm - 1,2 cm]** (6)	MP3

			CA from 4.1.3	
	4.1.4	Return trip = 70 km × 2 ✓ **MA** = 140 km ✓ **A** Number of litres = 0,086 ℓ/km × 140 km ✓ **MCA** = 12,04 ℓ ✓✓ **CA**	1MA multiplying distance by 2 1A correct answer 1MCA multiplying by 0,086 ℓ/km 2CA answer (5)	MP3
	4.1.5	Probability = $\frac{2}{6}$ ✓**A** ✓**A** = 33,33% ✓ **C**	1A numerator 1A denominator 1C conversion to % (3)	P2
4.2	4.2.1	9,84252 × 0,3048 ✓ **MA** = 3 m ✓ **A**	1MA multiplying correct values 1A correct answer (2)	M2
			CA from 4.2.1	
	4.2.2	4 × 3 m ✓ **M** = 12 m ✓ **A**	1M multiplying by 4 1A correct answer (2)	M2
	4.2.3	To prevent overflowing of water when people are swimming. ✓✓ **J** **OR** To avoid water spillage when swimming.	2J relevant reason **Accept any sensible reason** (2)	M4

	4.2.4	**Volume** refers to the total amount of space covered by water in the swimming pool holding water, ✓✓ **A** whereas **capacity** refers to the actual space in a swimming pool. ✓✓ **A** **OR** **Volume** is the space that is occupied by water in the swimming pool. **Capacity** refers to the amount of water needed to fill the swimming pool.	2A correct definition of **volume in context** 2A correct definition of **capacity in context** (4)	M2
			CA from 4.2.1	
	4.2.5	Area of backyard = 7 m × 5 m ✓ **SF** = 35 m^2 ✓ **A** Area of pool = 3 m × 3 m ✓ **SF** = 9 m^2 ✓ **A** Area that will not be paved = 35 m^2 – 9 m^2 ✓**M** ✓**MCA** = 26 m^2 ✓ **CA**	1SF substituting the correct values 1A correct answer 1SF substituting the correct values 1A correct answer 1M concept of subtraction 1MCA two correct values 1CA (7)	M3
			[35]	

QUESTION 5

Q		Answer	Explanation	Level
5.1	5.1.1	Southbound ✓ **A** Pretoria comes before Rosebank in the Southbound. ✓ **J** **OR** Pretoria comes after Rosebank in the Northbound. ✓ **J**	1A correct answer 1J relevant reason (2)	M4
	5.1.2	07:18 ✓✓ **RT**	2RT correct value (2)	M2
	5.1.3	✓**M** 07:49 – 07:18 = 31 minutes + 10 minutes ✓ **MA** = 41 minutes ✓ **CA**	**CA from 5.1.2** 1M subtracting correct values 1MA adding walking time 1CA correct answer (3)	M2
	5.1.4	- It saves time, as it travels faster. ✓✓ **O** - No traffic delays. ✓✓ **O** **OR** - It is safe. ✓✓ **O** **OR** Any reasonable advantage	2O relevant opinion 2O relevant opinion (4)	M4
	5.1.5	°F = (1,8 × 30) + 32 ✓ **SF** = 86 °F ✓ **A**	1SF substituting temperature 1A correct answer **AO** (2)	M2
5.2	(i)	M ✓✓ **A**	2A correct answer (2)	P2
	(ii)	N ✓✓ **A**	2A correct answer (2)	P2
	(iii)	JF ✓✓ **A**	2A correct answer (2)	P2
5.3		Lengthwise = $\frac{126}{6}$ ✓ **MA** = 21 ✓ **A** Widthwise = $\frac{53}{6}$ = 8,83 ≈ 8 ✓ **A** Heightwise = $\frac{72}{12}$ = 6 ✓ **A** No. of tins = 21 × 8 × 6✓ **M** = 1 008 cans ✓ **CA** ∴ The claim is invalid. ✓ **J**	1MA dividing correct values 1A correct answer 1A correct answer 1A correct answer 1M multiplying values 1CA 1J justifying the answer (7)	MP4
			[26]	
			TOTAL: 150	