GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION
GRADE 12

2023

MATHEMATICAL LITERACY
(PAPER 2)

MATHEMATICAL LITERACY P2

C2602E

X05

TIME: 2 hours

MARKS: 100

8 pages and an addendum of 6 pages

This question paper consists of 8 pages.
An addendum with 6 annexures is included as an insert in the question paper.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Use the ADDENDUM as follows:

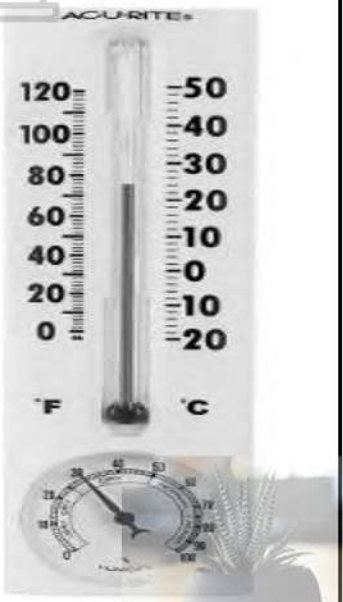
   Use ANNEXURE A for QUESTION 1.3
   Use ANNEXURE B for QUESTION 2.1
   Use ANNEXURE C for QUESTION 2.3
   Use ANNEXURE D for QUESTION 4.2
   Use ANNEXURE E for QUESTION 4.3

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 Pheladi bought the instruments below to monitor her temperature. Study the pictures below and answer the questions that follow.

A



B

1.1.1 Name the instruments represented above. (2)

1.1.2 Round-off the digital reading from instrument **B** above, to the nearest ten. (2)

1.1.3 Which instrument (**A** or **B**) displays a lower reading? (2)

1.2 Pheladi uses the two types of clocks below to manage time. Use the information displayed on the clocks to answer the questions that follow.

C

Displayed time: Morning

D

1.2.1 Write the time on clock D in words. (2)

1.2.2 Express the time on clock C in a 24-hour format. (2)

1.2.3 Pheladi went to visit her mother in Nelspruit. She left home at the time displayed on clock C and arrived at the time displayed on clock D. For how long did she travel? (2)

1.3 Pheladi went to the local university to apply for a bursary. She used the map (on ANNEXURE A) to find the university. Study the map on ANNEXURE A and answer the questions that follow.

1.3.1 Identify the national road found on this map. (2)

1.3.2 What is the general direction of Pick & Pay from the Formula One Hotel? (2)

1.3.3 How many sets of traffic lights will she pass when travelling from Enoz Mabusa Street to Tshwane University? (2)

1.3.4 In which direction should Pheladi drive if she is travelling from Rob Ferreira Hospital to Tshwane University? (2)

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PLEASE DETACH THIS ADDENDUM WITH 6 PAGES.

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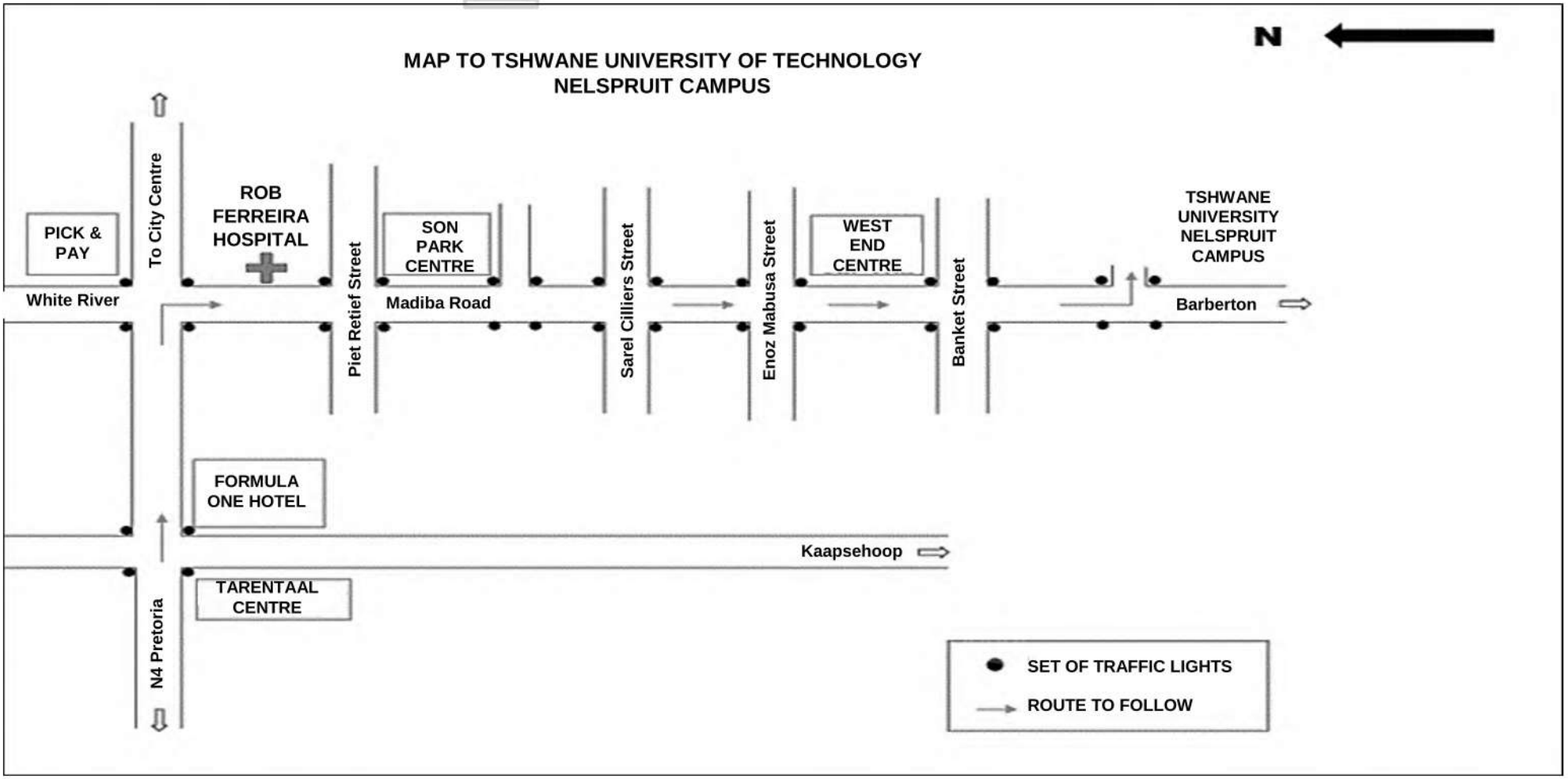
ADDENDUM

6 pages

ANNEXURE A

QUESTION 1.3



ANNEXURE B

QUESTION 2.1

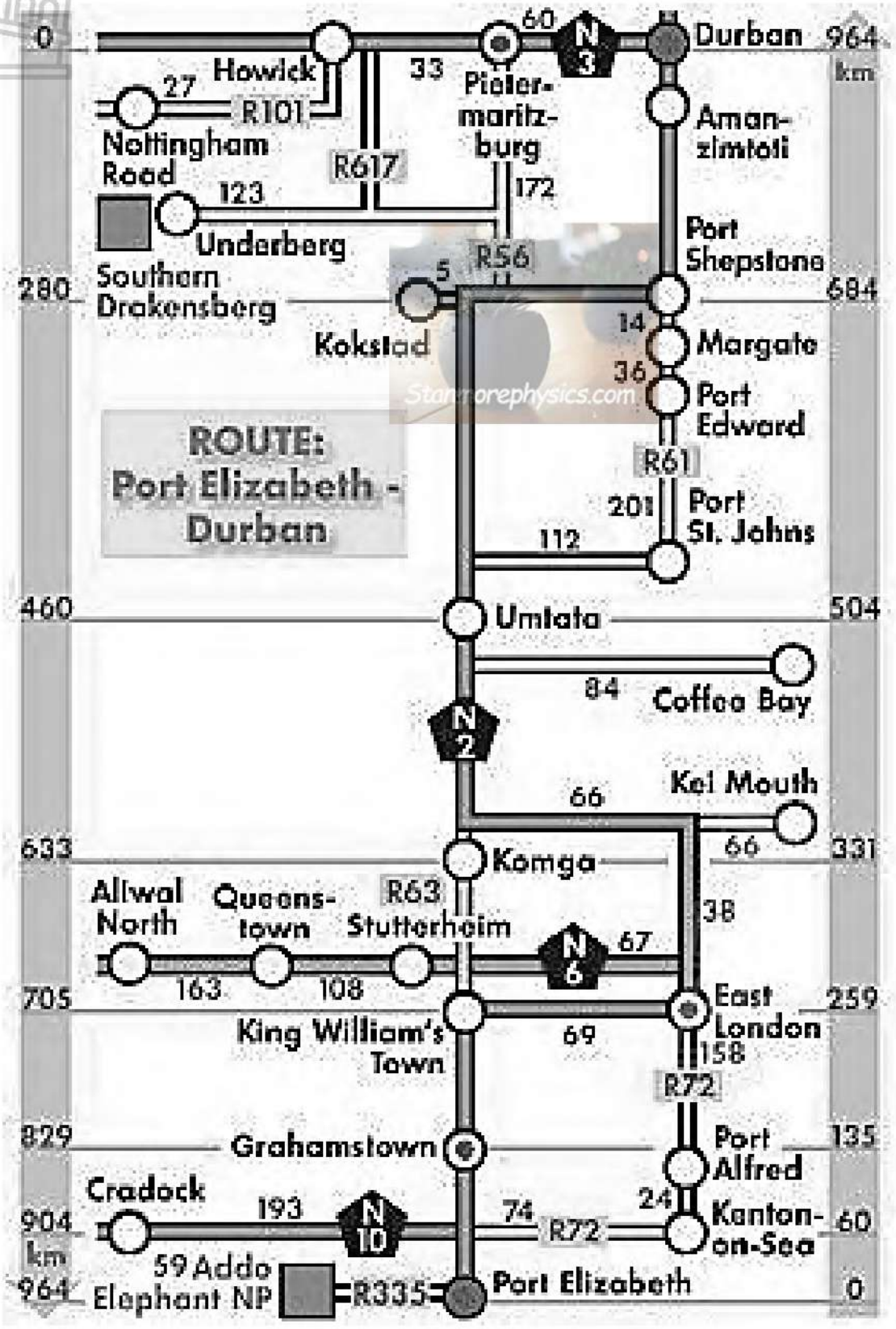
ANNEXURE C

QUESTION 2.3

George												
773	Bloemfontein											
438	1 004	Cape Town										
1 319	634	1 753	Durban									
645	584	1 079	674	East London								
465	601	899	854	180	Grahamstown							
1 171	398	1 402	578	982	999	Johannesburg						
762	177	962	811	780	667	472	Kimberley					
1 183	410	1 431	236	752	932	356	587	Ladysmith				
1 203	464	1 343	821	1 048	1 065	287	380	597	Mafikeng			
335	677	769	984	310	130	1 075	743	1 062	1 548	Port Elizabeth		
880	570	1 314	439	235	415	869	747	517	1 003	545	Umtata	
926	153	1 156	564	737	754	258	294	340	451	830	718	Welkom
1 701	928	1 932	1 118	1 512	1 529	530	1 002	894	808	1 605	1 403	788	Messina

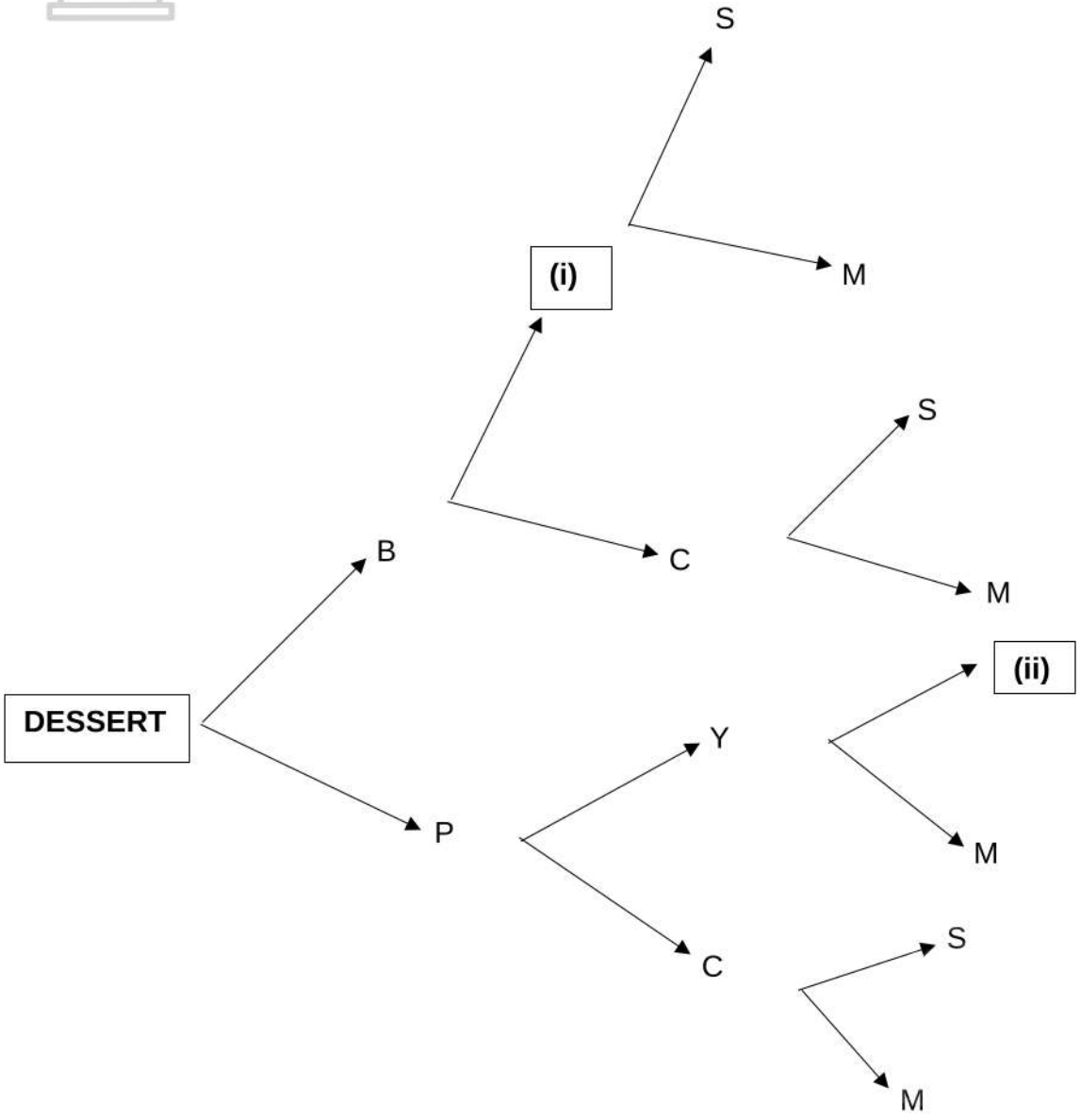
ANNEXURE D

QUESTION 4.2



ANNEXURE E

QUESTION 4.3



QUESTION 2

2.1 Mpho and Mandla are travelling together from Krugersdorp to Pretoria to attend a meeting to organise a Mathematical Literacy Olympiad. Study the map in ANNEXURE B and answer the questions that follow.

2.1.1 Which neighbouring province is situated to the south of Gauteng? (2)

2.1.2 Identify the scale used on the map. (2)

2.1.3 Name the last town they will pass before they can reach Pretoria. (2)

2.2 After the meeting, Mandla decided to visit his friend in Bronkhorstspruit.

2.2.1 Write detailed instructions to direct him from Pretoria to Bronkhorstspruit. (4)

2.2.2 How many toll gates will Mandla pass on his journey from Krugersdorp to Bronkhorstspruit? (2)

2.2.3 Calculate the actual, straight-line distance, from Krugersdorp to Bronkhorstspruit (in km). (6)

2.3 Mpho decided to take a bus from Johannesburg to Bloemfontein. The bus stopped twice for 20 minutes at each stop. The bus departed at 07:20 and arrived in Bloemfontein at 11:30. She claimed that they were travelling at an average speed of 120 km/h. Use ANNEXURE C to verify her claim.

You may use the formula:
Distance = Time $\times$ Average speed (6)
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QUESTION 3

3.1 Shirley has a catering company and she bought an urn to prepare tea for her customers. She uses a bucket to fill the urn.

The dimensions of the urn and the dimensions of the bucket are indicated below. Study the information below and answer the questions that follow.

- The height of the urn excluding the lid is 380 mm. **N.B. 1 ℓ = 1 000 cm³**
- The base of the urn is 4 cm high.
- The volume of the bucket is 18,46 litres.

3.1.1 Define the term volume in this context. (2)

3.1.2 Determine the height of the bucket, rounded-off to the nearest cm.
You may use the formula: $\mathbf{Volume} = \ell \times b \times h$ (6)

3.1.3 Show that the circumference of the urn is 138,248 cm.
You may use the formula: **Circumference = $\pi \times$ d**; where π = 3,142 (2)

3.2 Shirley boiled the water and wrapped the outer part of the urn (the steel part) with foil.

3.2.1 What is the importance of wrapping the urn with foil? (2)

3.2.2 Determine the radius of the urn. (2)

3.2.3 Hence, calculate the area of the urn which was covered with the foil.
You may use the formula: **Area to be covered = 2πr $\times$ h**; where π = 3,142 (5)

3.2.4 Determine the volume of the urn.
You may use the formula: **Volume of urn = $\pi r^2 h$**; where π = 3,142 (2)

3.3. Shirley uses a bucket to refill the urn. The bucket holds 18,46 litres of water. Determine the number of buckets needed to refill the empty urn. (4)

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QUESTION 4

4.1 Sipho owns a bakery and he makes and sells bread and cakes to the local community. A fast selling item is banana bread with custard. The recipe to prepare the banana bread is indicated below. Study the recipe below and answer the questions that follow.

Recipe for banana bread:

2 medium (7 inches) ripe bananas
75 g butter
½ teaspoon baking soda
1 pinch salt
150 g sugar
1 large egg
1 teaspoon vanilla essence
1 and ½ cup flour

The recipe caters for 8 people.
1 inch = 2,54 cm
1 cup = 200 g

4.1.1 Convert 7 inches to cm. (2)

4.1.2 How many loaves are needed to serve 45 people? (4)

4.1.3 Determine the number of **full** cups of butter required to bake 3 loaves. (5)

4.1.4 Sipho bought 2,5 kg of sugar and claimed that he can prepare the banana bread to serve more than 150 people. Verify his claim. (5)

4.1.5 Express the amount of sugar to butter in the simplest ratio. (3)

4.2 Sipho lives in Cradock and travels every weekend, via Kenton-on-Sea to his restaurant in East London. He claims that his return trip covers 1 000 km. Use ANNEXURE D to verify his claim. (6)

4.3 Sipho also owns a catering company. For dessert, clients can choose from the following options:

Base:

Banana bread **(B)** or Malva pudding **(P)**

Top:

Yoghurt **(Y)** or Custard **(C)**

Decoration:

Strawberries **(S)** or Mint chocolate flakes **(M)**

The tree diagram in ANNEXURE E represents the different options of dessert. Study the tree diagram and answer the questions that follow.

4.3.1 Complete the tree diagram by writing the values of (i) and (ii). (2)

4.3.2 How many possible outcomes are represented in the tree diagram? (2)

4.3.3 What is the probability of choosing a dessert with the banana bread base? (2)

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TOTAL: 100

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MARKING GUIDELINES

MATHEMATICAL LITERACY

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Codes	Explanation
M	Method
MA	Method with Accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
D	Definition
J	Justification/Reason/Explain
S	Simplification
RT/RD/RG	Reading from a table/graph/diagram/map/plan
F	Choosing the correct formula
SF	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 **OR** omitting units

KEY TO TOPIC SYMBOL:

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

6 pages

QUESTION 1

Q		Solution: Answer only = full marks.	Explanation	Marks	Level
1.1	1.1.1	Thermometers ✓✓**2A**	2A correct answer	(2)	M1
	1.1.2	40 °C ✓✓**2A**	2A correct answer	(2)	M1
	1.1.3	A ✓✓**2A**	2A correct answer	(2)	M1
1.2	1.2.1	Eight minutes past twelve in the afternoon ✓✓**2A**	1A correct time 1A afternoon	(2)	M1
	1.2.2	11:54 ✓✓**2A**	2A correct answer **Accept 11:53**	(2)	M1
	1.2.3	12:08 – 11:54 ✓**1M** = 14 minutes ✓**1A**	**CA from 1.2.2** 2A correct answer **Accept 15 minutes**	(2)	M1
1.3	1.3.1	N4 ✓✓**2A**	2A correct answer	(2)	MP1
	1.3.2	NE ✓✓**2A**	2A correct answer	(2)	MP1
	1.3.3	8 ✓✓**2A**	2A correct answer	(2)	MP1
	1.3.4	Southerly ✓✓**2A**	2A correct answer	(2)	MP1
				[20]	

QUESTION 2

Q		Solution	Explanation	Marks	Level
2.1	2.1.1	Free State ✓✓**2A**	2A correct answer	(2)	MP1
	2.1.2	Bar scale/linear scale/graphic scale ✓✓**2A**	2A correct answer	(2)	MP1
	2.1.3	Centurion ✓✓**2A**	2A correct answer	(2)	MP1
2.2	2.2.1	• Travel towards the **east** ✓**A** • Use **N4** ✓**A** • Pass **the toll gate** ✓**A** • Bronkhorstspruit will be on the left. ✓**A**	4A correct answer	(4)	MP2
	2.2.2	1/One ✓✓**2A**	2A correct answer	(2)	MP1
	2.2.3	Bar length = 2,2 cm ✓**A** Map length = 8,5 cm ✓**A** Actual distance = $\frac{8{,}5\ \text{cm}\ ✓}{2{,}2\ \text{cm}\ ✓}$ **2MCA** × 30 km ✓**M** = 115,90 km ✓**CA** *(Measure on final printed copy.)	1A measured bar length 1MCA measure map length 1MCA numerator 1MCA denominator 1M multiplying by 30 1CA answer **NPR**	(6)	MP3
2.3		Distance = 398 km ✓**RT** Time = 11:30 −07: 20 − 40 min ✓**M** = 3,5 h ✓**CA** Distance = Time × $speed$ Average speed = $\frac{398\ \text{km}}{3{,}5\ \text{h}}$ ✓**SF** = 113,71 km/h ✓**CA** ∴ The claim is invalid. ✓**O**	1RT correct value 1M subtracting correct values 1CA answer 1SF correct values 1CA answer 1O conclusion	(6)	MP4
				[24]	

QUESTION 3

Q		Answer	Explanation	Marks	Level
3.1	3.1.1	Amount of space in a bucket occupied by water. ✓✓**2D** (Accept: Any logical/sensible explanation.)	2D correct definition	(2)	M1
	3.1.2	18,46 × 1 000 ✓**C** = 18 460 cm^3 ✓**A** 18 460 ✓**SF**= 30 × 22 × h ✓**SF** h = $\frac{18\ 460}{660}$ ✓**M** ∴ h = 28 cm ✓**CA**	1C multiplying by 1 000 1A answer 1SF for volume 1SF for length and width 1M changing subject of formula 1CA rounded answer	(6)	M3
	3.1.3	Circumference = 3,142 × 44 ✓✓**SF** = 138,248	2SF correct values	(2)	M2
3.2	3.2.1	Prevents rapid loss of heat ✓✓**2J**	2O Opinion	(2)	M2
	3.2.2	Radius = $\frac{44}{2}$ ✓**MA** = 22 cm ✓**A**	1MA dividing by 2 1A correct answer **AO**	(2)	M2
	3.2.3	380 mm – 40mm✓MA h = $\frac{340}{10}$ ✓MCA = 34 cm ✓CA Area = 2 × 3,142 × 22 × 34 ✓**SF** = 4700,432✓**CA** cm²	**CA radius from 3.2.2** 1MA for subtracting 40mm 1MCA dividing by 10 1CA correct answer 1SF correct values 1CA correct answer **NPR**	(5)	M3
	3.2.4	V = 3,142 × (22)^2 × 38 ✓**SF** = 57 787,66 cm^3 ✓**CA**	**CA radius from Q3.2.2** 1SF values CA final answer	(2)	M2

Q	Answer	Explanation	Marks	Level
3.3	$V = 3{,}142 \times (22)^2 \times 34$ $= 51\,704{,}752\ cm^3$ ✓**CA** $\frac{51\,704{,}752}{18460}$ ✓**M** = 2,8 ✓**CA** = 3 buckets ✓**R**	**CA from 3.2.4** 1CA simplification 1M dividing values correct order 1CA simplification 1R rounding	(4)	M3
			[25]	

QUESTION 4

Q		Answer	Explanation	Marks	Level
4.1	4.1.1	= 7 × 2,54 ✓**M** = 17,78 cm ✓**A**	1M multiplying 1A correct answer	(2)	M2
	4.1.2	$\frac{45}{8}$ ✓✓**2A** = 5,625 ✓**A** ≈ 6 ✓**R**	1A numerator 1A denominator 1A answer 1R rounding-up	(4)	M2
	4.1.3	75 g × 3 ✓**MA** = 225 g✓**A** $\frac{225}{200}$ ✓**M** = 1,125 ✓**CA** ≈ 1 full cup ✓**R**	1MA multiplying by 3 1A answer in grams 1M dividing correct values 1CA answer 1R rounding-down	(5)	M3
	4.1.4	2,5 kg × 1 000 ✓**MA** = 2 500 g ✓**C** $\frac{2\ 500\ g}{150\ g} \times 8$ ✓**M** = 133,3 ≈ 134 people ✓**A** ∴ The claim is invalid. ✓**O**	1MA multiplying by 1000 1C conversion to grams 1M calculation 1A correct answer 1O conclusion	(5)	M4
	4.1.5	150 : 75 ✓**RT**✓**A** 2 : 1 ✓**S**	1RT correct values 1A correct order 1S simplification	(3)	M2

4.2	193 + 74 + 24 + 158 ✓✓**2A** = 449✓**A** × 2 ✓**M** = 898 km ✓**CA** ∴ The claim is invalid. ✓**O**		2A for adding 2 correct values 1A answer 1M multiplied by 2 1CA answer 1O conclusion	(6)	MP4
4.3	4.3.1	(i)Y✓**A** (ii)S✓**A**	1A correct answer 1A correct answer	(2)	P2
	4.3.2	8✓✓**2A**	2A correct answer	(2)	P2
	4.3.3	$\frac{4}{8}$ ✓**RT**✓**M** **OR** 50% **OR** ½ **OR** 0,5 **OR** Even Chance	1RT correct values 1M correct order	(2)	P2
				[31]	
				TOTAL: 100	