



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

SEPTEMBER 2026

MARKS: 150

TIME: 3 hours

**This question paper consists of 11 pages and
a SPECIAL ANSWER BOOK of 19 pages.**

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions.
2. Answer ALL the questions ONLY in the SPECIAL ANSWER BOOK provided.
3. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
4. Show ALL calculations clearly.
5. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
6. Indicate units of measurement, where applicable.
7. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
8. Write neatly and legibly.

QUESTION 1

1.1 TABLE 1 below contains a list of concepts and formulae used in Mathematical Literacy.

TABLE 1: DEFINITIONS OF CONCEPTS AND FORMULAE

LETTER	DEFINITIONS
A	$C = 2\pi r$
B	$A = \pi r^2$
C	Determines how many times smaller an object shown on a plan or map is than its actual size.
D	The amount of space that a substance or object occupies or that is enclosed within a container.
E	Body Mass Index
F	The three-dimensional space that is occupied by a gas, solid or gas.
G	The chance that an event will take place.
H	If you see 1 : 100 on a map means that the map is 100 times smaller than in real life.

Use TABLE 1 above and match a definition or a formula with EACH of the concepts below. Write only the letter (A–H) next to the question numbers (1.1.1 to 1.1.5), e.g. 1.1.6 G.

1.1.1 BMI (2)

1.1.2 Scale (2)

1.1.3 Circumference of a circle (2)

1.1.4 Probability (2)

1.1.5 Capacity (2)

1.2 Use the floor plan of the house in the ANSWER BOOK to answer the questions that follow.

1.2.1 Identify the view of the structure shown on the plan. (2)

1.2.2 Measure in mm the length of AB shown on the plan. (2)

1.2.3 (a) Identify the type of scale used. (2)

(b) Explain the meaning of the scale given on the plan. (2)

1.2.4 Define the term *floorplan*. (2)

1.3

Shown below are the ingredients to make basic cupcakes.



Ingredients:

Cupcakes:

375 ml ($1\frac{1}{2}$ cups) cake flour
10 ml (2 t) baking powder
2 ml ($\frac{1}{2}$ teaspoon) salt
187 ml ($\frac{3}{4}$ cup) sugar
2 extra-large eggs
125 ml ($\frac{1}{2}$ cup) margarine
125 ml ($\frac{1}{2}$ cup) milk
5 ml (1 teaspoon) vanilla essence
24 paper cups

Icing:

125 ml ($\frac{1}{2}$ cup) margarine
750 ml (3 cups) icing sugar
10 ml (2 teaspoon) vanilla essence
10 ml (2 teaspoon) hot water
24 marshmallows



[From: <http://www.hulettssugar.co.za>]

Use the information above to answer the questions that follow.

- 1.3.1 Determine in ml the total amount of margarine needed. (2)
- 1.3.2 Convert 750 ml icing sugar to litres (l). (2)
- 1.3.3 Calculate, in teaspoons, the amount of vanilla essence needed if the recipe is doubled. (2)
- 1.3.4 5 ml of baking powder has a mass of 4 g.
Calculate the grams of baking powder needed. (2)
- 1.3.5 Determine, in cups, the amount of cake flour and sugar needed for the recipe. (2)

[30]

QUESTION 2

- 2.1 ANNEXURE A shows the route that can be used to travel from Bloemfontein to Beaufort West, or from Kimberley to Beaufort West.

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

- 2.1.1 Name the type of map shown in ANNEXURE A. (2)
- 2.1.2 State THREE provinces that appear on the map. (3)
- 2.1.3 Determine the distance between Three Sisters and Victoria West. (3)
- 2.1.4 Thato stated that the difference in distance from Kimberley to Beaufort West and the distance from Bloemfontein to Beaufort West is 29 km. Verify, with calculations, whether his statement is CORRECT. (4)

- 2.2 Thato went to the nearby mall to buy a gazebo. Parts to assemble the gazebo were packed with a manual in the box. The picture of an assembled gazebo is shown below.

PICTURE OF ASSEMBLED GAZEBO



- 2.2.1 (a) It took Thato 34 minutes to drive back home from the mall at an average speed of 86 km/h.

Thato claimed that the distance from the mall to his home is 38 km. Verify, with calculations, whether his claim is VALID.

You may use the following formula:

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

- (b) Determine the time Thato will reach home, if he left the mall at 12:36. (2)

- 2.2.2 The steps to assemble the gazebo are given in the ANSWER BOOK.
 Match ALL the descriptions in COLUMN 2 to the correct step in COLUMN 1.
 Write down ONLY the step number next to the correct letter,
 e.g. step 4 – F. (3)

- 2.3 KwaZulu-Natal's coastline is the most popular tourist destination, particularly during the winter season. Its coast stretches from Port Edward to Kosi Bay with a total estimated total length of 580 km.

The map for the KwaZulu-Natal coastline is shown on the ANNEXURE B in the ANSWER SHEET.

Use the map and information above to answer the questions that follow.

- 2.3.1 The most densely populated part of the coastline is from Port Edward to Umhlali.

Calculate the length (in km) of this part of the coastline if it is 40% of the total KwaZulu-Natal coastline. (2)

- 2.3.2 The length of the KwaZulu-Natal coastline on the map is 210 mm.

Calculate, to the nearest hundred thousand, the scale of this map in the form: 1 : ... (4)

- 2.3.3 The N3 shown on the map, is a toll road

Suggest ONE reason why motorists travelling on a toll road have to pay toll fees. (2)

[30]

QUESTION 3

3.1



A farmer has a wheat field that is 8 km long and 4 km wide. He uses a straight-line **irrigation system**. This is a system where a long pipe mounted on wheels moves across the field and sprays water as it moves.

Picture of straight-line irrigation system



Picture of circular irrigation system



Use the information above to answer the questions that follow.

3.1.1 Calculate the area of the field in square meters.

You may use the following formula:

$$\text{Area of rectangle} = \text{length} \times \text{width} \quad (3)$$

3.1.2 Name ONE source of water for irrigation. (2)

3.1.3 The farmer also has a circular irrigation system which can spray a circular area with a radius of 250 m. Calculate, in square kilometers, the area that the system can cover.

You may use the following formula:

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

3.1.4 Determine the number of times he will need to move the circular system along the dimensions of the field (without overlapping). (5)

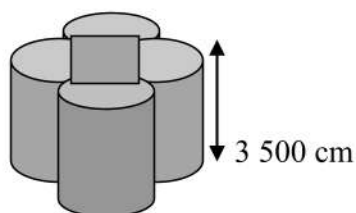
3.1.5 The farmer stated that when moving the circular irrigation system along the dimensions of the rectangular field, it will cover the whole area of the field (without overlapping).

Verify whether his statement is TRUE. (6)

3.2

The diagram below shows a structure intended to be used as a silo.

NOTE: There are four cylindrical silos and one square silo.



Dimensions of the silo's:

The side length of the square silo = 17,5 m

Diameter of the cylindrical silo = 17,5 m

NOTE : $\pi = 3,142$ (Picture not according to scale)

Use the information above to answer the questions that follow.

3.2.1 Calculate the volume of the silo in m^3 .

You may use the following formulae:

Volume = length $\times$ width $\times$ height

Volume = $3,142 \times \text{radius}^2 \times \text{height}$

(8)

3.2.2 Calculate the surface area of ONE cylindrical silo.

You may use the following formula:

Surface Area of silo = $2 \times 3,142 \times \text{radius}^2 + 2 \times 3,142 \times \text{radius} \times \text{height}$

(4)

[31]

QUESTION 4

4.1 ANNEXURE C shows the floor plan for the hospital.

Use ANNEXURE C to answer the questions that follow.

4.1.1 Write down the number of operating theaters shown on the floor plan. (2)

4.1.2 Describe the route Patient A will follow from the waiting room to the endoscopy procedure room. (3)

4.1.3 The hospital decides to paint the interior walls of one of the operating rooms.

- The area to be painted is $60,45 \text{ m}^2$
- The spread rate is $1 \text{ m}^2 / 0,1 \ell$
- Two coats of paint will be applied
- Paint is sold in 5ℓ tins
- 5ℓ tin of paint cost R500 each

Calculate the cost of paint needed for the project. (9)

4.1.4 Thabo claimed that the hospital has 33 rooms that are used daily.

Calculate, as a decimal fraction, the probability that a randomly selected room is a theatre room used daily. (3)

4.2 Mary's child was sick and was taken to the hospital. At the hospital the child's weight, height and temperature were measured to determine the appropriate medicine dosage to be given.

Use the information above to answer the questions that follow.

4.2.1 (a) Determine, rounded to the nearest whole number, the BMI of the child using the information given in the table below.

GENDER	AGE	WEIGHT	HEIGHT
Female	2 years	46,2966 lbs	0,86 m

NOTE: $1 \text{ kg} = 2,2046 \text{ lbs}$

You may use the following formula:

$$\text{BMI (kg/m}^2\text{)} = \frac{\text{weight (kg)}}{\text{height (m}^2\text{)}} \quad (5)$$



(b)

WEIGHT STATUS CLASSIFICATIONS	
WEIGHT STATUS	BMI
Underweight	Less than the 14
Healthy weight	Between 14 and 20
At risk of overweight	Between 20 and 26
Overweight	Above 26

Use the table above to answer the questions that follow

Identify the weight status of the child.

(2)

- 4.2.2 The child's temperature was 38,5 °C.
Convert her temperature to nearest degrees Fahrenheit.

You may use the following formula:

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

(4)

- 4.2.3 The doctor prescribed medication for the child. He recommended that the child be given the dosage as calculated using the formula below.

$$\text{Childs dosage: } \frac{\text{childs' age (years)}}{\text{childs' age} + 12} \times \text{adults medicine dosage}$$

Show that the medicine dosage for the child will be 2,587 mℓ if the average adult's medicine dosage is 20 mℓ.

(4)

[32]

QUESTION 5

5.1 Study the map of Italy on ANNEXURE D in the ANSWER SHEET and answer the questions that follow.

5.1.1 Name the closest town directly west of SLOVENIA (2)

5.1.2 Name the country capital of Italy. (2)

5.1.3 Write the type of scale used on this map. (2)

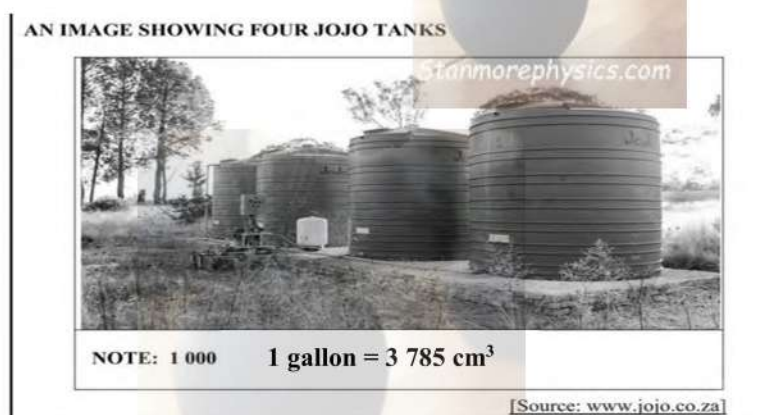
5.1.4 Determine the scale of the map. (3)

5.1.5 Use the scale in question 5.1.4 to determine the actual distance from Bari to Cantanzaro in miles.

NOTE: 1 km = 0,621371 miles (5)

5.1.6 It takes 170 hours and 24 minutes to travel from South Africa to Italy. The tourist said it will take him 7 days 2 hour and 24 minutes. Verify, whether his statement is CORRECT. (4)

5.2 Mary wants to install four JOJO water tanks in her property to grow vegetable. One JOJO tank holds 1 387 gallons of water



5.2.1 Convert 1 387 gallons to cm³ (2)

5.2.2 Calculate the height of ONE JOJO tank, if its radius is 91 cm

You may use the following formula:

Volume = $3,142 \times \text{radius}^2 \times \text{height}$ (4)

5.2.3 Calculate the total amount of water, in liters, that Mary will have stored on her property. (3)

[27]

TOTAL: 150

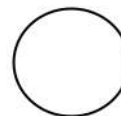




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NSC Answer book



Sequence No. On mark sheet

Senior Certificate Grade 12 - Preparatory exam 2026

NAME OF SCHOOL

NAME OF CANDIDATE GRADE 12 CLASS

DATE BOOK NR OF BOOKS

SUBJECT CODE M L I T PAPER NUMBER 2

SUBJECT NAME MATHEMATICAL LITERACY

MARKER				MODERATOR'S INITIALS IN RELEVANT BLOCK																				
Question	Marks			Marker's Code & Initials	Marks			INTERNAL	Marks			EXTERNAL	Marks			SES	Marks			UMALUSI	Marks			DE
1																								
2																								
3																								
4																								
5																								
TOTAL																								

This answer book consists of 19 pages.

FOLLOW THESE INSTRUCTIONS CAREFULLY

1. Clearly write your schools' name and your own name and class in the space provided.
2. Answer ALL questions in the spaces provided in this ANSWER BOOK ONLY. If you require additional space for answers:
 - 2.1 Use the additional space provided at the end of each question in the ANSWERBOOK
 - 2.2 When answering a question in the additional space, indicate clearly the question number in the column on the left-hand side.
3. No pages may be torn from this ANSWER BOOK.
4. Candidates may not retain an ANSWER BOOK or remove it from the examination room.
5. Answers must be written in black/blue ink as distinctly as possible.
6. Do not write in the margins.
7. Draw a neat line through any work/rough work that must NOT be marked.

QUESTION 1

	Solution	Marks
1.1.1		(2)
1.1.2		(2)
1.1.3		(2)
1.1.4		(2)
1.1.5		(2)
1.2	Floorplan of a house 	
1.2.1		(2)
1.2.2		(2)
1.2.3		(2)
1.2.4		(2)

1.2.5		(2)
1.3.1		(2)
1.3.2		(2)
1.3.3		(2)
1.3.4		(2)
		[28]

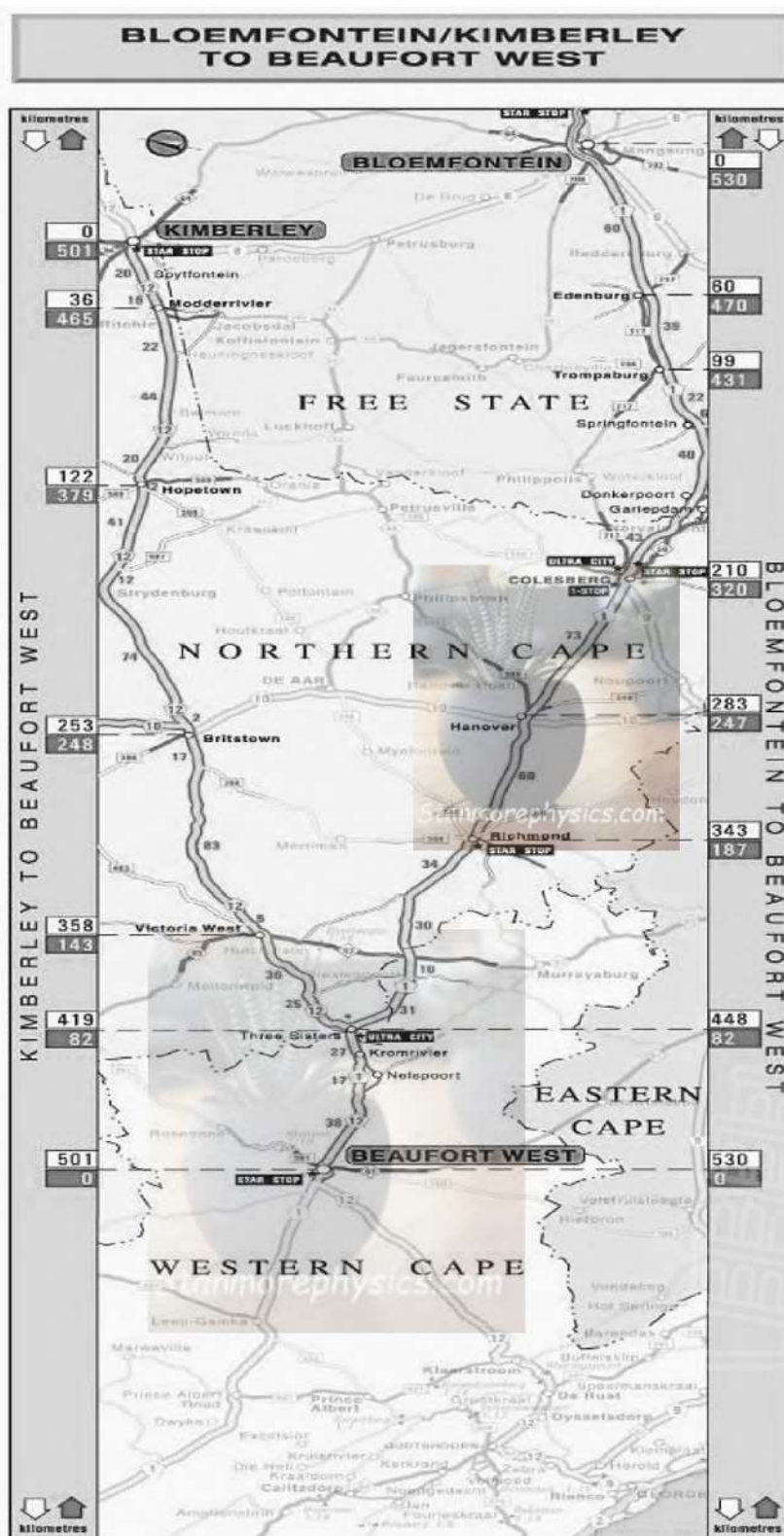
Extra space

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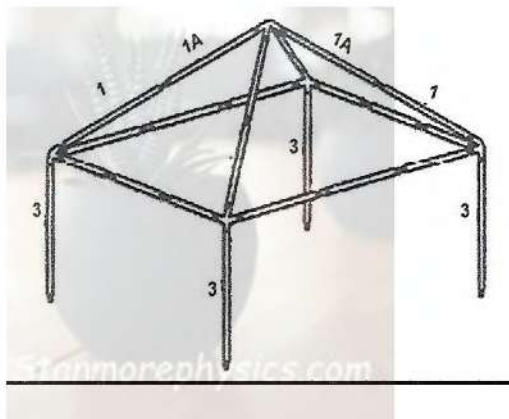
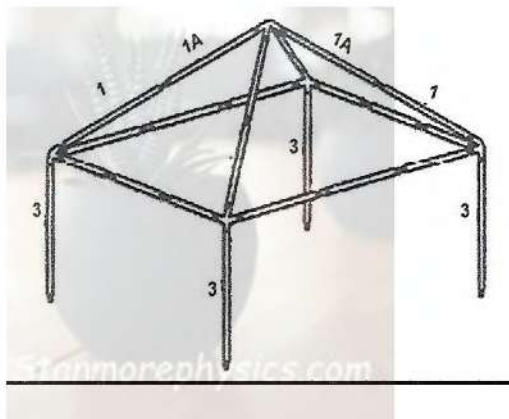
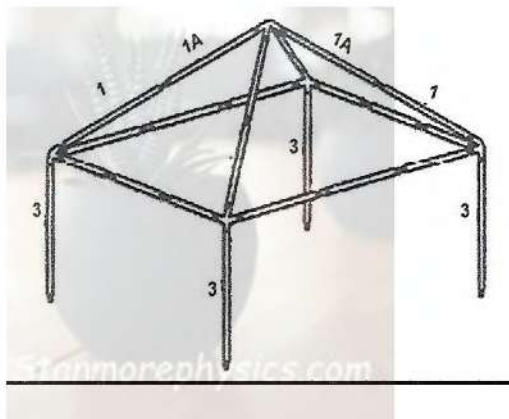
	Solution	Marks

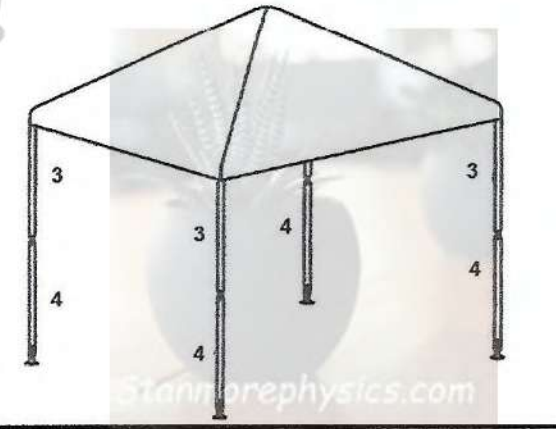
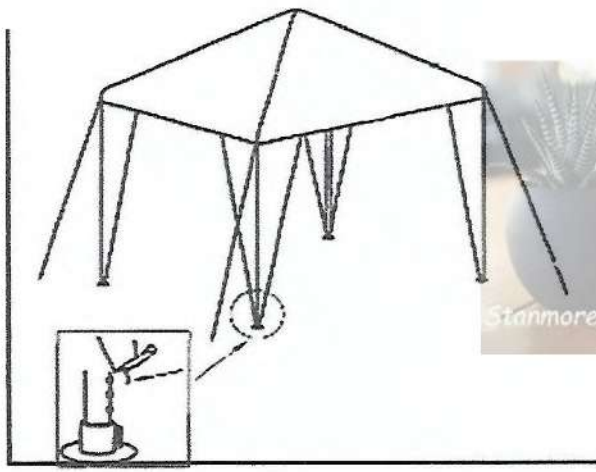
QUESTION 2

ANNEXURE A



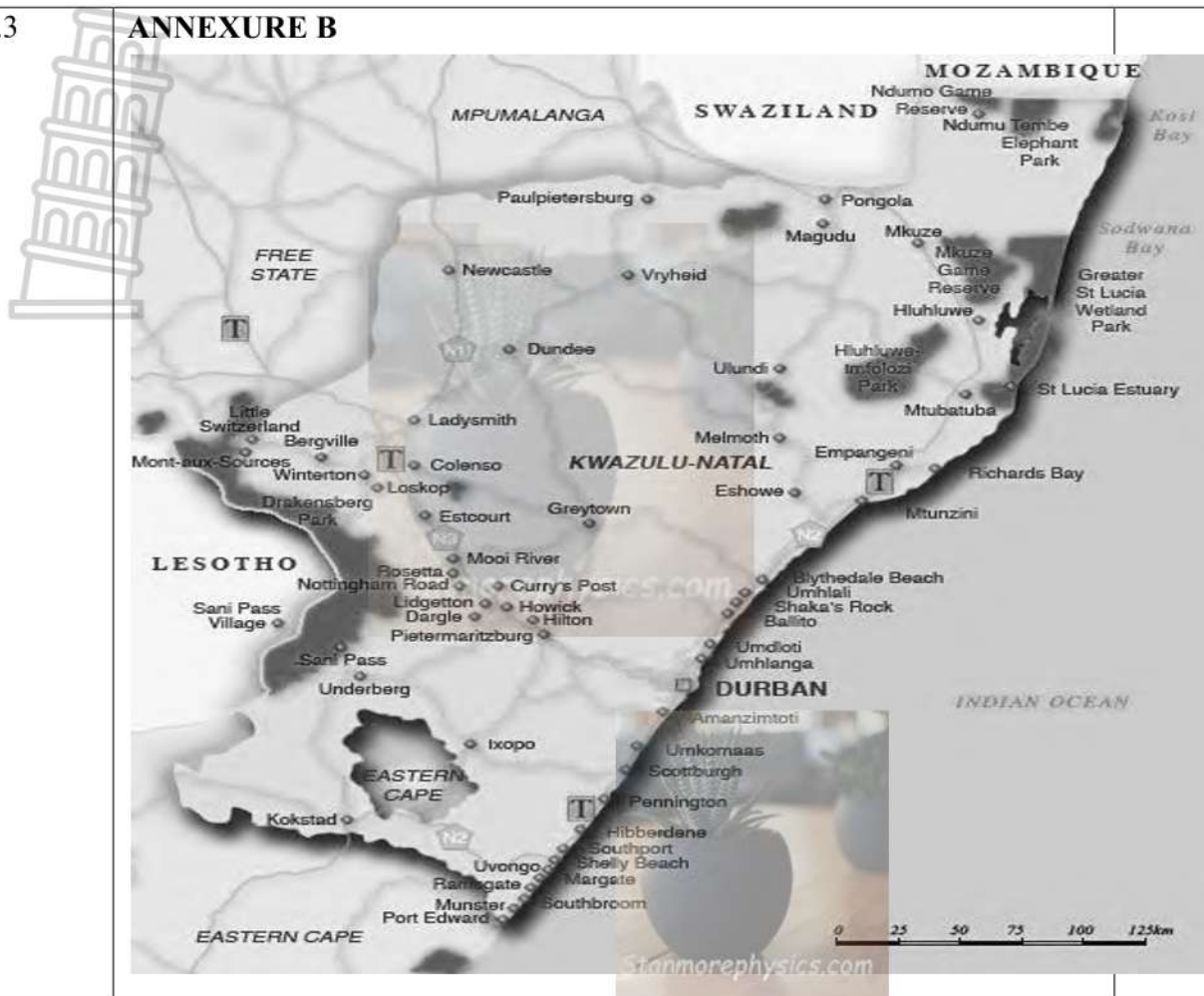
[Source: www.aa.co.za]

	Solution	Marks						
2.1.1		(2)						
2.1.2		(2)						
2.1.3		(3)						
2.2.1(a)		(5)						
2.2.1(b)		(2)						
2.2.2	<table><tr><th colspan="2">MANUAL TO ASSEMBLE THE GAZEBO</th></tr><tr><th>COLUMN 1</th><th>COLUMN 2</th></tr><tr><td>STEP 1 </td><td>A Draw the gazebo cover over the framework (already assembled) Push the remaining legs (pipes 4) in position.</td></tr></table>	MANUAL TO ASSEMBLE THE GAZEBO		COLUMN 1	COLUMN 2	STEP 1 	A Draw the gazebo cover over the framework (already assembled) Push the remaining legs (pipes 4) in position.	
MANUAL TO ASSEMBLE THE GAZEBO								
COLUMN 1	COLUMN 2							
STEP 1 	A Draw the gazebo cover over the framework (already assembled) Push the remaining legs (pipes 4) in position.							

	STEP 2:  STEP 3: 	B Pull the cover over the legs of the gazebo. Attach the metal angles to the pipe holes C Attach pole 1 and 1A in the middle Attach the top frame, use pipes 2 and 2A and the side angles Attach poles numbered 3 in the side angles.	
2.2.2			(3)

2.3

ANNEXURE B



2.3.1

(2)

2.3.2

(4)

2.3.3

(2)

[30]

Extra Space



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QUESTION 3

	Solution	Marks
3.1.1		(3)
3.1.2		(3)
3.1.3		(2)
3.1.4		(3)
3.1.5		(3)
3.1.6		(7)

	Solution	Marks
3.2.1		(8)
3.2.2		(3)
		[32]

tra Space

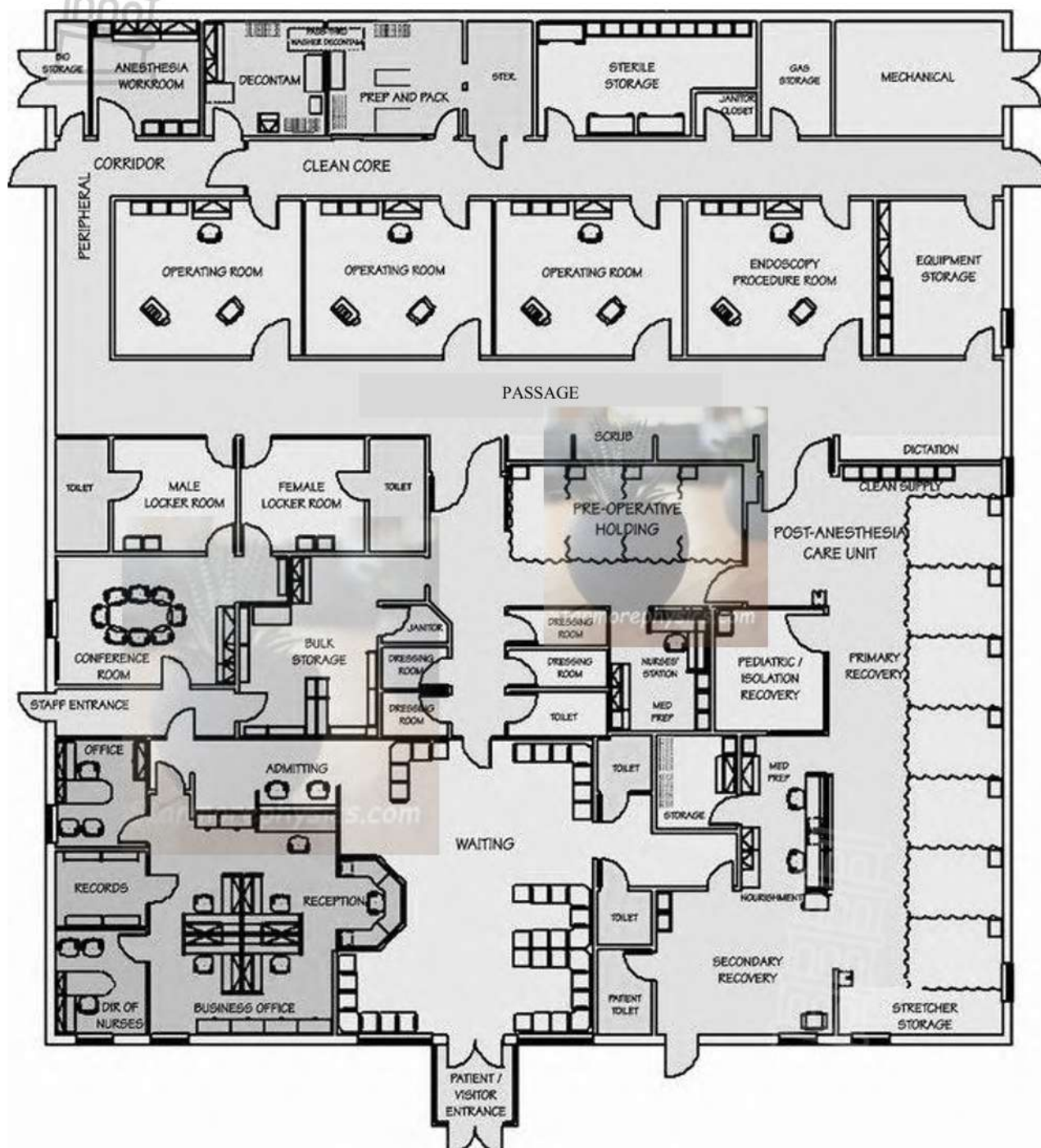


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QUESTION 4

4.1 ANNEXURE C

FLOORPLAN OF THE HOSPITAL



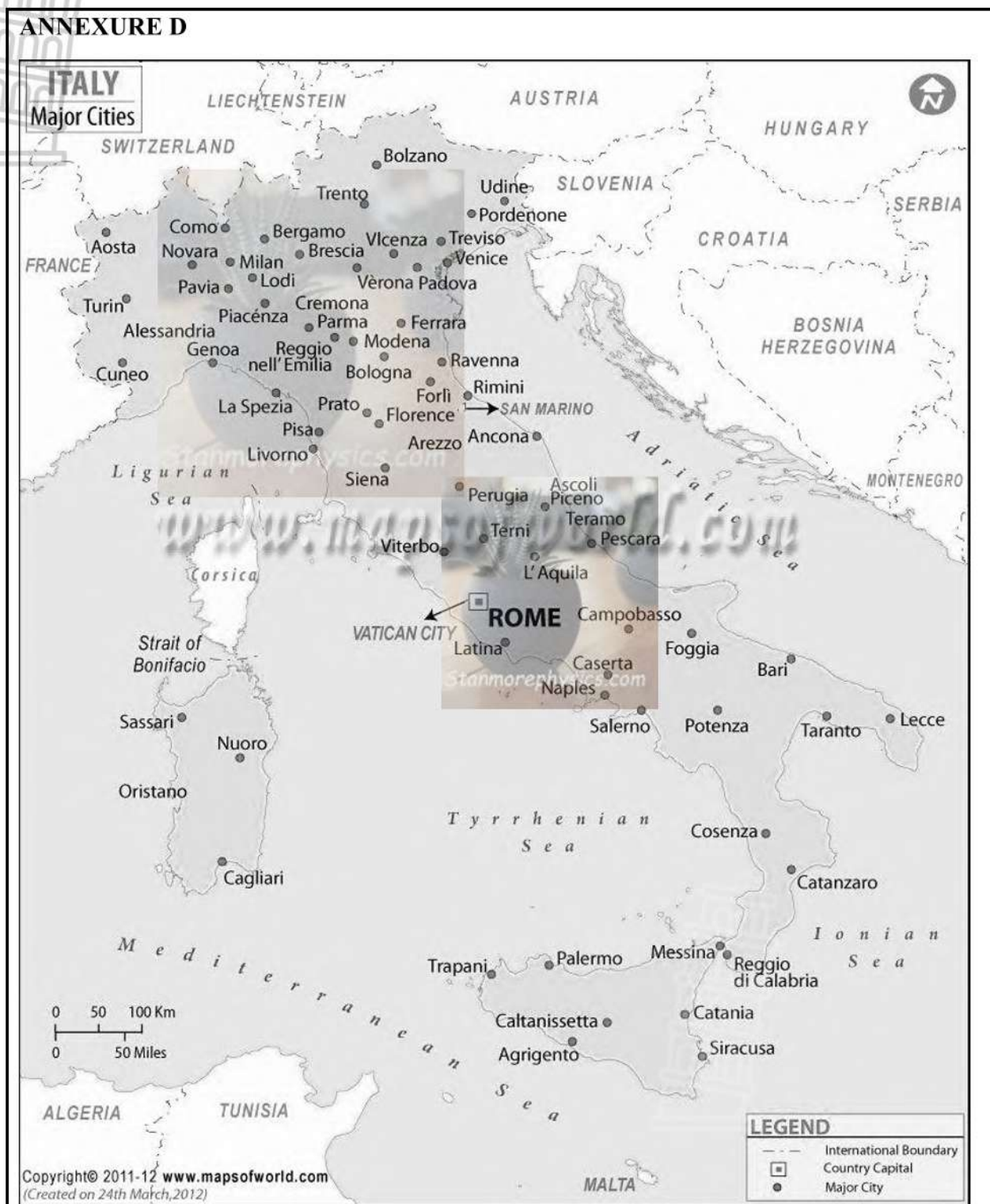
	Solution	Marks
4.1.1		(2)
4.1.2		(3)
4.1.3		(2)
4.1.4		(3)
4.2.1(a)		(4)
4.2.1(b)		(2)
4.2.2		(4)

Sc
2.3

[illegible]

QUESTION 5

5.1 ANNEXURE D



Study the map of Italy above and answer the questions that follow.

5.1.1		(2)

5.1.2		(2)
5.1.3		(2)
5.1.4		(3)
5.1.5		(5)
5.1.6		(2)
5.2.1		(4)
5.2.2		(4)
5.2.3		(3)
		[27]
TOTAL:		150

Extra Space

[illegible]



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE/ NASIONALE SENIOR SERTIFIKAAT

GRADE 12/GRAAD 12

**MATHEMATICAL LITERACY P2/
WISKUNDIGE GELETTERDHEID V2
SEPTEMBER 2026
MARKING GUIDELINES/NASIENRIGLYNE**

MARKS/PUNTE: 150

Symbol/Kode	Explanation/Verduideliking
M	Method/Metode
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/a graph/document/ diagram/Lees vanaf tabel/grafiek/diagram
SF	Correct substitution in a formula/Korrekte vervanging in formule
O	Opinion/Explanation/Reasoning/Opinie/Verduideliking/Redenasie
P	Penalty, e.g. for no units, incorrect rounding off, etc/Penalisasie, bv. vir geen eenhede, verkeerde afronding, ens.
R	Rounding off/Afronding
NPR	No penalty for correct rounding/Geen penalisasie vir korrekte afronding nie
AO	Answer only/Slegs antwoord

**This marking guidelines consists of 10 pages./
Hierdie nasienriglyne bestaan uit 10 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 penalize for every extra item presented.
- Rounding is an independent mark.
- General marking principle, 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 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 [30 MARKS/PUNTE] Answer only AO – full marks			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
1.1.1	E✓✓RT	2RT reading for table/lees van die tabel (2)	M L1 E
1.1.2	C✓✓RT	2RT reading from table/lees van die tabel (2)	M L1 E
1.1.3	A✓✓RT	2RT reading from table/lees van die tabel (2)	M L1 E
1.1.4	G✓✓RT	2 RT reading from table/lees van die tabel (2)	P L1 E
1.1.5	D✓✓RT Accept both D & F	2RT reading from table/lees van die tabel (2)	M L1 E

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
1.2			
1.2.1	Top view/ <i>Bo-aansig</i> ✓✓ A OR/OF Aerial view/ <i>Lug-aansig</i>	2A correct answer/ <i>regte antwoord</i> (2)	M&P L 1 E
1.2.2	93mm ✓✓ Accept 92 mm – 94 mm	2A correct measurement/ <i>korrekte afmeting</i> (2)	M L 1 E
1.2.3	Number scale/ <i>nommer skaal</i> ✓✓ A	2A correct scale/ <i>regte skaal</i> (2)	M/P L 1 E
(a)	Ratio scale		
(b)	One unit on the plan represent 115 units on the actual plan./ <i>Een eenheid op die plan verteenwoordig 115 eenhede op die werklike plan</i> ✓✓ A	2A Correct explanation/ <i>korrekte verduideliking</i> (2)	M&P L 1 E
1.2.4	A floorplan is a top view of the house, with all the necessary layout in each space./ <i>'n vloerplan is die bo-aansig van 'n huis met die nodige uitleg van elke vertrek</i> ✓✓ A	2A correct definition/ <i>regte definisie</i> (2)	M&P L 1 E
1.3			
1.3.1	$2 \times 125 \text{ ml}$ ✓M $= 250 \text{ ml}$ ✓A OR $125 + 125$ $= 250 \text{ ml}$	1MA adding correct values/ <i>regte waardes optel</i> 1A answer/ <i>antwoord</i> (2)	M L 1 E
1.3.2	$\frac{750}{1\,000}$ ✓MA $= 0,75 \text{ l}$ ✓A	1 MA correct method/ <i>regte metode</i> 1 A correct answer/ <i>regte antwoord</i> (2)	F L 1 E
1.3.3	$5 \text{ ml} + 10 \text{ ml}$ ✓M $= 15 \text{ ml} \times 2$ $= 30 \text{ ml}$ $= 6 \text{ teaspoons}$ ✓A OR $(1 + 2) \times 2$ $= 6$	1M correct values/ <i>korrekte waardes</i> 1A answer/ <i>antwoord</i> (2)	M L 1 E
1.3.4	$4\text{g} = 5\text{ml}$ $x = 10 \text{ ml}$ $x = \frac{4 \times 10}{5}$ ✓S $= 8 \text{ g}$ ✓A $10 \div 5 \times 4$ $= 8 \text{ g}$	1MA multiplying and dividing/ <i>vermenigvuldiging en deling</i> 1A answer/ <i>antwoord</i> (2)	M L 1 E

1.3.5	$1\frac{1}{2}$ cups + $\frac{3}{4}$ cups✓ $= 2\frac{1}{4}$ cups✓ OR 2,25 If a learner give $\frac{9}{4}$ cups NO MARKS	1 MA adding correct values/optelling van korrekte waardes 1A answer/antwoord (2)	
		[30]	
QUESTION/VRAAG 2 [30 MARKS/PUNTE]			
2.1			
2.1.1	Strip map/strookkaart✓✓ A Strip chart Do not accept ROUTE MAP	2 A correct map/regte kaart (2)	MP L1 E
2.1.2	Free State /Vrystaat✓ Northern Cape /Noord-Kaap✓ Western Cape /Wes-Kaap✓RT	3 RT reading from map/aflees van kaart (3)	MP L1 M
2.1.3	419 - 358✓MCA✓RT = 61 km✓CA	1 RT both correct values/beide korrekte waardes 1MCA Subtraction/afrekking 1CA Simplification /vereenvoudig (3)	MP L2 M
2.1.4	530✓RT - 501✓RT✓MCA = 29 km OR 243 - 82 = 61 km OR 36 + 25 = 61 km Her answer is correct/haar antwoord is korrek✓O	1RT 530 1RT 501 1 MCA Subtraction/afrekking 1O opinion/opinie (4)	MP L4 M
2.2			

2.2.1 (a)	Distance = speed $\times$ time ✓MA <i>Afstand = spoed $\times$ tyd</i> $= 86 \text{ km/h} \times \frac{34}{60} \text{ h} \checkmark \text{SF}$ $= 48,73333 \text{ km} \checkmark \text{S}$ Claim is INVALID ✓O/ <i>Stelling is NIE-GELDIG NIE</i> OR/OF Distance = speed $\times$ time <i>Afstand = spoed $\times$ tyd</i> $= 86 \text{ km/h} \times 0,5666666... \text{ h} \checkmark \text{C} \checkmark \text{SF}$ $= 48,73333 \text{ km} \checkmark \text{S}$ OR $\frac{38}{34,6}$ $= 67,05 \text{ km/h}$ Claim is INVALID ✓O/ <i>Stelling is NIE-GELDIG NIE</i>	1MA changing the subject of the formula/<i>verander die onderwerp van die formule</i> 1C conversion min to hours/<i>verander van min na ure</i> 1SF substitution/<i>vervanging</i> 1CA simplification/<i>vereenvoudig</i> 1O opinion/<i>opinie</i> (5)	MP L4 M
(b)	12:36 + 34 min ✓MA $= 13:10 \checkmark \text{A}$	1MA adding/<i>optelling</i> 1A correct answer/<i>korrekte Antwoord</i> AO (2)	M L2 E
2.2.2	Step / Stap 1 – C ✓A Step/ Stap 2 – A ✓A Step/ Stap 3 – B ✓A ACCEPT only C, A, B	1A correct step/<i>korrekte stap</i> 1A correct step/<i>korrekte stap</i> 1A correct step/<i>korrekte stap</i> (3)	M L1 E
2.3			
2.3.1	$580 \times \frac{40}{100} \checkmark \text{MA}$ $= 232 \text{ km} \checkmark \text{A}$	1MA multiply by 40%/<i>vermenigvuldig met 40%</i> 1A answer/<i>antwoord</i> (2)	MP L1 E
2.3.2	210 mm : 580 km ✓ $210 \text{ mm} = 580\,000\,000 \text{ mm} \checkmark \text{C}$ $1 : 2\,761\,904,762 \checkmark \text{CA}$ $1 : 2\,800\,000 \checkmark \text{R}$	1A ratio in correct order/<i>verhouding in die regte volgorde</i> 1 C conversion/<i>skakel om in km</i> 1 CA simplification/<i>vereenvoudig</i>	MP L3 M

		1R rounding/afronding (4)	
2.3.3	Road maintenance, limiting congestion on the road, more lanes to travel/ <i>padwerke, opeenhoping van verkeer/meer lane om in te ry.</i> ✓✓O	2O opinion/ <i>opinie</i> (2)	MP L4 E
		[30]	
QUESTION/VRAAG 3 [31] MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
3.1			
3.1.1	$\text{Area} = l \times w$ $= 8 \times 4$ ✓SF $= 32 \text{ km}^2$ ✓A $= 32\,000\,000 \text{ m}^2$ ✓C OR/OF $8 \times 1\,000 = 8\,000 \text{ m}$ $4 \times 1\,000 = 4\,000 \text{ m}$ ✓C $\text{Area} = 8\,000 \text{ m} \times 4\,000 \text{ m}$ ✓SF $= 32\,000\,000 \text{ m}^2$ ✓	1 SF substitution/ <i>regte waardes</i> 1A answer/ <i>antwoord</i> 1 C conversion / <i>herleiding</i> OR/OF 1 C conversion/ <i>herleiding</i> 1 SF substitution in the formula/ <i>vervang in die formule</i> 1 A answer/ <i>antwoord</i> (3)	M L2 E
3.1.2	Bore holes/ <i>Boorgat</i> ✓✓A Rivers/ <i>Riviere</i> Any relevant answer/ <i>Enige relevante antwoord</i>	2A answer/ <i>antwoord</i> (2)	M L4 E
3.1.3	$\text{Area} = \pi r^2$ $= 3,142 \times (0,250)^2$ ✓C ✓SF $= 0,196375 \text{ km}^2$ ✓A OR $3,142 \times 250^2$ $= 196\,375 \div 1000^2$ $= 0,196375 \text{ km}^2$	1C conversion 1SF substitute into formula/ <i>vervang in formule</i> 1A answer with unit / <i>antwoord met regte eenheid</i> (3)	M L2 M
3.1.4	$\text{width} = 4000 \text{ m} \div 500 \text{ m}$ ✓MA $= 8$ ✓A $\text{Length} = 8\,000 \text{ m} \div 500 \text{ m}$ $= 16$ ✓A $\therefore 8 \times 16$ ✓MCA $= 128 \text{ times}$ ✓CA/128 <i>keer</i>	1MA divide by correct value/ <i>deel met korrekte waarde</i> 1A answer/ <i>antwoord</i> 1A answer/ <i>antwoord</i> MCA multiplying/ <i>vermenigvuldiging</i> 1CA answer/ <i>antwoord</i> (5)	M L2 M
3.1.5	Area of the field is 32 km^2 ✓CA/ <i>Oppervlakte van die veld is 32 km^2</i> Area covered by circular system is $0,196349 \text{ km}^2$ / <i>oppervlakte wat opgeneem word deur sirkelvormige sisteem</i> $0,196349 \text{ km}^2 \times 128$ ✓MCA	CA from question 3.1.1, 3.1.3 and 3.1.4 1CA area of field and circular field/ <i>oppervlakte van die land en die sirkelvormige veld</i>	M L4 M

	$= 25,132672 \text{ km}^2 \checkmark \text{CA}$ $= 32 \text{ km}^2 - 25,132672 \text{ km}^2 \checkmark \text{MCA}$ $= 6,867328 \text{ km}^2 \checkmark \text{CA}$ Give 5/6 for this option Statement not correct $\checkmark \text{O}$ / <i>Stelling nie korrek nie</i> OR 16×8 $= 128 - 1 \checkmark$ $= 127 \checkmark$ $0,196375 \text{ km}^2 \times 127 \checkmark \text{MCA}$ $= 24,939625 \text{ km}^2 \checkmark \text{CA}$ $= 32 \text{ km}^2 - 24,939625 \text{ km}^2 \checkmark \text{MCA}$ $= 7,060375 \text{ km}^2 \checkmark \text{CA}$ Give full marks for this option OR $8 - 1 = 7$ 7×16 $= 112 \text{ times}$ $0,196375 \text{ km}^2 \times 112 \checkmark \text{MCA}$ $= 21,994 \text{ km}^2 \checkmark \text{CA}$ $= 32 \text{ km}^2 - 21,994 \text{ km}^2 \checkmark \text{MCA}$ $= 10,006 \text{ km}^2 \checkmark \text{CA}$ Give 3/5 for this option	1MCA multiply with 128/ <i>vermenigvuldiging met 128</i> 1CA simplification/ <i>vereenvoudig</i> 1MCA subtraction/ <i>aftrekking</i> 1CA simplification/ <i>vereenvoudig</i> 1O opinion/ <i>opinie</i> (6)	
3.2			
3.2.1	Volume = length $\times$ width $\times$ height <i>/Volume = lengte $\times$ breedte $\times$ hoogte</i> $= 17,5 \text{ m} \times 17,5 \text{ m} \times 35 \text{ m} \checkmark \text{C} \checkmark \text{SF}$ $= 10\,718,75 \text{ m}^3 \checkmark \text{CA}$ Volume = $3,142 \times r^2 \times h$ $= 3,142 \times (8,75 \text{ m})^2 \checkmark \text{A} \times 35 \text{ m} \checkmark \text{SF}$ $= 8\,419,578 \text{ m}^3 \times 4 \checkmark \text{A}$ $= 33\,678,3125 \text{ m}^3$ Total volume / <i>Totale volume</i> = $33\,678,3125 +$ $10\,718,75 \checkmark \text{MCA}$ $= 44\,397,0625 \text{ m}^3 \checkmark \text{CA}$	1 C conversion/ <i>herleiding</i> 1 SF substitution in the formula/ <i>vervanging in die formule</i> 1CA answer/ <i>antwoord</i> 1 A radius/ <i>radius</i> 1 SF substitution/ <i>vervanging</i> 1 A multiplying by 4/ <i>vermenigvuldiging met 4</i> 1MCA adding/ <i>optelling</i> 1CA answer/ <i>antwoord</i> (8)	M L3 D
3.2.2	Surface Area of silo $= 2 \times 3,142 \times \text{radius}^2 + 2 \times 3,142 \times \text{radius} \times \text{height}$ $= (2 \times 3,142 \times 8,75^2) + (2 \times 3,142 \times 8,75 \times 35)$ $\checkmark \text{SF} \checkmark \text{SF}$ $= 481,11875 \text{ m}^2 + 1\,924,475 \text{ m}^2 \checkmark \text{MCA}$ $= 2\,405,59375 \text{ m}^2 \checkmark \text{CA}$	CA radius and height from 3.2.1 1SF substitution in the formula/ <i>vervanging in die formule</i> 1SF substitute into formula/ <i>vervanging in die formule</i> 1MCA adding/ <i>optelling</i> 1CA simplification/ <i>vereenvoudig</i> (4)	M L2 M
		[31]	

QUESTION/VRAAG 4 [27 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
4.1.1	3 operating theaters/ 3 operasie teaters ✓✓RT	2RT reading from map/aflaes vanaf vloerplan (2)	MP TL 2 E
4.1.2	Go up and pass toilet and dressing rooms on your right. ✓. Pass the passage and continue straight to the door, ✓ then on the passage turn right on your left is the operating room, the next door is your destination ✓. Loop verby die toilet en aantrekkamers aan jou regterkant ✓. Verby die gang en draai regs ✓ aan jou linkerkant is die operasie saal en die volgende deur is jou bestemming ✓ OR/OF Door on your right side at post anaesthesia care unit ✓ turn left through the door ✓ and the endoscopy room will be right in front of you, the door is on the right side. ✓ Deur aan jou regterkant by die narkose-sorgeenheid. ✓ Draai links deur die deur. ✓ Die endoskopiekamer sal reg voor jou wees. Die deur is aan die regterkant. ✓	1A dressing room/aantrekkamer 1A passage/gang 1A left destination/linker bestemming (3)	M/P TL 2M
4.1.3	Amount of paint needed/Totaal verf benodig $= 60,45 \text{ m}^2 \times 0,1$ ✓MA $= 6,045 \text{ l}$ ✓A Two coats/Twee lae $= 6,045 \text{ l} \times 2$ ✓MCA $= 12,09 \text{ l}$ ✓CA Number of tins/Aantal blikke $= \frac{12,09}{5}$ ✓MCA $= 2,418$ ✓CA $= 3 \times 5 \text{ l tins}$ ✓R/blikke Cost/Koste $= 3 \times \text{R}500$ ✓MCA $= \text{R}1\,500$ ✓CA	1MA multiplying/vermenigvuldiging 1A simplification/vereenvoudig 1MCA multiplying by 2/vermenigvuldiging met 2 1CA simplification/vereenvoudig 1MCA dividing by 5/deel by 5 1CA simplification/vereenvoudig 1R rounding up/afronding na bo 1MCA multiplying by 3/vermenigvuldiging met 3 1CA simplification/vereenvoudig (9)	M TL 3 D
4.1.4	$P = \frac{3}{33}$ ✓✓A $= 0,09$ ✓CA	1A numerator/deler 1A denominator/noemer 1CA simplification/vereenvoudig (3)	P TL2 E

4.2.1 (a)	$46,2966 \div 2,2046 \checkmark C$ $= 21 \text{ kg} \checkmark A$ $BMI (kg/m^2) = \frac{(21 \text{ kg})}{(0,86 \text{ m})^2} \checkmark SF$ $= 28,3937 \text{ kg/m}^2 \checkmark CA$ $= 28 \text{ kg/m}^2 \checkmark R$ OR $BMI = \frac{(64.2966 \text{ kg})}{(0,86 \text{ m})^2} \checkmark SF$ $= 62,59680909 \text{ kg/m}^2 \checkmark CA \div 2,2046 \checkmark C$ $= 28 \text{ kg/m}^2 \checkmark R$	1C conversion/herleiding 1A simplification/vereenvoudig 1SF substitution in the formula/vervang in die formule 1CA simplification/vereenvoudig 1R rounding/afronding (5)	M TL 3 M
(b)	Overweight/Oorgewig $\checkmark \checkmark CA$	2CA from 4.2.1 (a) (2)	M TL 4 E
4.2.2	$38,5^\circ C = (^\circ F - 32) \div 1,8 \checkmark SF$ $^\circ F = (38,5 \times 1,8) + 32 \checkmark A$ $= 101,3^\circ F \checkmark S$ $= 101^\circ F \checkmark R$	1SF substitution in the formula/vervang in die formule 1A changing the subject/verander die onderwerp 1S simplification/vereenvoudig 1R rounding/afronding (4)	M TL 3 M
4.2.3	Use Youngs rule/Gebruik Young se reël $= \frac{\text{childs' age (years)}}{\text{childs' age} + 12} \times \text{adults medicine dosage}$ $= \frac{2}{2+12} \checkmark SF \times 20 \checkmark SF$ $= 2,8571428571$ $= 2,857 \text{ ml} \checkmark A$ Not true $\checkmark O$ If no conclusion was given FULL MARKS	2SF substitute correct values in formula/vervang in formule 1A answer/antwoord 1O opinion (4)	M TL 4 M
			[32]

QUESTION/VRAAG 5 [27] MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
5.1			
5.1.1	Udine ✓✓RT	2RT reading from map/aflees vanaf kaart (2)	M/P TL 1 E
5.1.2	Rome ✓✓RT	2 RT reading from map/aflees vanaf kaart (2)	M/P TL 1 M
5.1.3	Line scale/Bar scale/graphical scale Lynskaal/Staafskaal/grafiese skaal ✓✓RT	2RT reading from map/aflees vanaf kaart (2)	M/P TL 1 E
5.1.4	14 mm ✓ : 100 km 14 mm: 100 000 000 ✓C 1: 7 142 857 ✓CA	1A correct measurement/korrekte afmeting 1 C conversion/herleiding 1 CA answer/antwoord (3)	M/P L3 M
5.1.5	1: 7 142 857 (Accept 34 – 36 mm) 35 × 7 142 857 ✓M = 249 999 995 mm ÷ 1 000 000 ✓C = 249,99 km ✓S × 0,621 ✓C = 155,250 miles ✓A OR 35 × 7 142 857 = 249 999 995 ÷ 1 000 000 = 249,999 995 × 0,621 = 155,250 miles	1 M multiply with scale/vermenigvuldiging met skaal 1 C convert to km/herlei na km 1 S simplification/vereenvoudig 1 C conversion/herleiding 1 A answer/antwoord (5)	M/P L 3 M
5.1.6	170 hours/ ure 24 minutes/minute 170 ÷ 24 ✓M = 7,08 days/ dae 0,08 × 24 ✓M = 2 hours/ ure Total travel time/Totale reistyd: 7 days/ dae 2 hours/ ure 24 minutes/ minute ✓A Statement is correct ✓O/Stelling is korrek OR 24 hrs x 7 hrs = 168 + 2 = 170 h 24 min Correct	1 M divide 24/ deel met 24 1 M multiply 24/ vermenigvuldig met 24 1 A days and hours/minutes/ regte dae, ure en minute 1A opinion/opinie (4)	M/P L 4 M
5.2			
5.2.1	1 387 × 3 785 ✓MA = 5 249 795 cm ³ ✓A	1A method/metode 1A answer/antwoord (2)	M L 2 M

5.2.2	$\text{Volume} = 3,142 \times \text{radius}^2 \times \text{height}$ $5\,249\,795\text{ cm}^3 = 3,142 \times 91^2 \times h \checkmark \text{M} \checkmark \text{SF}$ $h = \frac{5\,249\,795}{3,142 \times 91^2} \checkmark \text{F}$ $h = 201,7685\text{ cm} \checkmark \text{A}$	CA with 5.2.1 1SF substitute into formula 1M correct method 1F change formula 1A correct answer (2)	M L3 M
5.2.3	$5\,249\,795\text{ cm}^3 \times 4 \checkmark \text{A}$ $= 20\,999\,180\text{ cm}^3 \div 1000\text{ l} \checkmark \text{C}$ $= 20\,999,18\text{ l} \checkmark \text{CA}$	CA from 5.2.1 1A multiplying by 4/ <i>vermenigvuldiging met 4</i> 1C conversion/ <i>herleiding</i> 1CA answer/ <i>antwoord</i> (3)	M L2 M
		[27]	
		TOTAL/TOTAAL:150	