Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porofensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2025

MATHEMATICAL LITERACY P2

MARKS: **100**

TIME: **2 hours**

This question paper consists of 10 pages and an addendum with 3 annexures.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of FOUR 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 4.3

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. Maps and diagrams are NOT drawn to scale, unless stated otherwise.

7. Round off ALL final answers appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Show ALL calculations clearly.

10. Write neatly and legibly.

QUESTION 1

1.1 Andrea bakes wedding cakes. The most popular cake she bakes, is a carrot cake with cream cheese frosting. Study the recipe below and answer the questions that follow.

INGREDIENTS

- 350 g self-raising flour
- 325 g dark soft brown sugar
- 1½ teaspoons fine sea salt
- 2 teaspoons cinnamon
- 200 ml olive oil
- 1 teaspoon vanilla extract
- 4 large eggs
- 250 g grated peeled carrots
- 75 g chopped pecan nuts
- 4 tablespoons milk

FOR CREAMY FROSTING

- 10 ounces cream cheese
- 1¼ cups (140 g) powdered sugar
- ¾ cup (80 ml) cold heavy cream
- ½ cup salted butter

METHOD

1. Preheat the oven to 356 °F.
2. Grease and line the bottom and sides of two round cake pans with a double layer of greaseproof paper.
3. Mix the flour, salt, sugar, cinnamon, chopped pecan nuts and grated carrots in a large bowl.
4. Beat together the eggs, olive oil, vanilla extract and milk in a large jug and add to flour mixture. Mix well.
5. Divide the cake batter between the prepared cake pans. Bake for 35–45 minutes until a skewer comes out clean.
6. Cool the cake layers in the pans for 15 minutes, then carefully turn the cake layers out onto cooling racks.

CREAM CHEESE FROSTING

1. Once the cake layers are completely cooled off, mix the cream cheese and butter in a blender for 1 and a half minutes.
2. Add powdered sugar until frosting is creamy. Whip cold heavy cream into the mixture for 3 minutes until light and fluffy.
3. Cover the cake in frosting – this will take up to 15 minutes.

BAKING CONVERSIONS

1 cup = 250 ml	1 tablespoon = 15 ml	1 teaspoon = 5 ml

[Adapted from https://www.inspiredtaste.net]

1.1.1 Calculate the time (in minutes) to cover the cake with the cream cheese frosting. (2)

1.1.2 Determine the amount of cream cheese needed in the recipe in kilograms.

NOTE: 1 kg = 35,274 ounces (2)

1.1.3 Convert the salt needed in the recipe to millilitres. (2)

1.1.4 Andrea's oven does not calibrate in degrees Fahrenheit. Determine the temperature, in °C, at which Andrea should set her oven.

You may use the following formula: $\textbf{°C} = \frac{5}{9} \times \textbf{(°F - 32°)}$ (2)

1.2 Andrea uses the measuring cup below to measure her ingredients.

[Adapted from www.googleimages.com/measuringcups]

1.2.1 Define the term *capacity*. (2)

1.2.2 Hence, determine the capacity of the measuring cup. (2)

1.3 Andrea bakes her cakes in round pans, each with a diameter as shown in the diagram below:

Diameter:

W = 5 inches
X = 8 inches
Y = 13 inches
Z = 16 inches

[Adapted from www.googleimages.com]

1.3.1 Calculate the circumference of pan **Y** in squared inches (in.^{2}).

You may use the following formula:

Circumference of a circle = $\pi \times$ **diameter**, where π **= 3,142** (2)

1.3.2 Write the diameter of pan **Z** to the diameter of pan **X** as a simplified ratio. (2)

1.4 The map below shows the distance between Andrea's house in Humansdorp and Jeffereys Bay where she needs to deliver a cake for a wedding.

[Adapted from www.googlemaps.com

Use the map above to answer the questions that follow.

1.4.1 Identify the clinic on the map. (2)

1.4.2 In which general direction will Andrea be travelling to Jeffreys Bay? (2)

1.4.3 Convert Andrea's travelling distance to metres. (2)

1.4.4 Determine the time that Andrea will arrive in Jeffreys Bay if she leaves her house at 10:15. (2)

[24]

QUESTION 2

2.1 Pilgrim's Rest is a small museum town in the Ehlanzeni district in Mpumalanga, South Africa.
It has approximately 1 721 residents and occupies an area of 25,40 km^2. The map of Pilgrim's Rest and surrounding areas is shown in ANNEXURE A.

Use ANNEXURE A to answer the following questions.

2.1.1 Identify the tourist attraction found in block D5. (2)

2.1.2 Determine the probability of finding a railway on this part of the map. (2)

2.1.3 Measure the distance between the Store Museum and the Town Hall in centimetres. (2)

2.1.4 Hence, calculate the actual distance (in kilometres) between the Store Museum and the Town Hall, using the bar scale. (5)

2.1.5 Determine the number of people per square kilometre (km^2) residing in Pilgrim's Rest. (2)

2.2 Siphokazi, who resides in Lydenburg, found the map of Mpumalanga and surrounding areas shown in ANNEXURE B.

Use ANNEXURE B to answer the following questions.

2.2.1 Name ONE neighbouring country bordering Mpumalanga. (2)

2.2.2 Identify the number of national roads found on this map. (2)

2.2.3 The actual distance between Lydenburg and Standerton is 276 km and it measures 8,3 cm on the map. Hence, determine the scale of this map. (3)

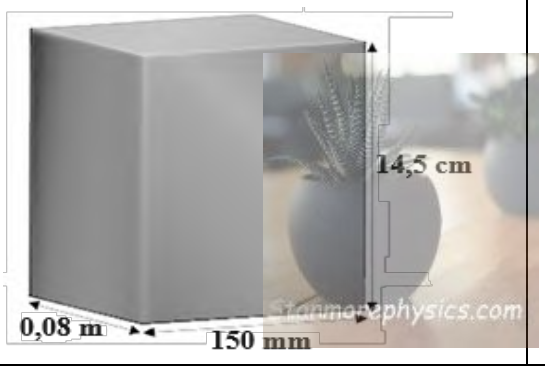
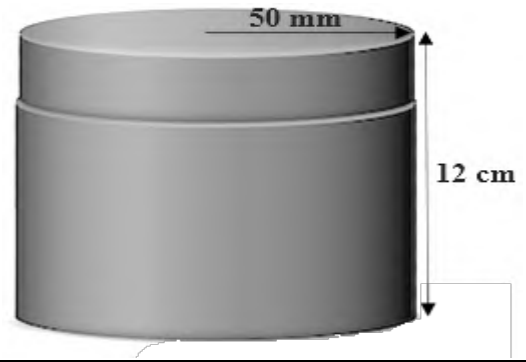
2.2.4 Siphokazi claims that if she travels at an average speed of 80 km/h and leaves her home at 12:45, she will arrive in Standerton at 16:05, without any stops. Verify, with the necessary calculations, whether her claim is VALID.

You may use the following formula: **Speed** $= \frac{\textbf{Distance}}{\textbf{Time}}$ (7)
[27]

QUESTION 3

3.1 Wilmien decided to sell imported coffee beans in resealable containers to generate funds in aid of a wheelchair for her physically disabled brother.

The diagram below shows two types of containers that Wilmien can choose from. The containers will be covered in petroleum-based plastic.

RECTANGULAR-SHAPED CONTAINER	CYLINDRICAL-SHAPED CONTAINER
	

The following formulae may be used:
Volume of a cylinder: $\pi \times \text{radius}^2 \times \text{height}$, where $\pi = 3{,}142$
Volume of a rectangular prism = **length × width × height**
Total surface area of a rectangular prism: **2 (l × w) + 2 (l × h) + 2 (w × h)**

3.1.1 Determine the volume of the cylindrical-shaped container in cubic centimetres (cm^3). (3)

3.1.2 Determine the total surface of the rectangular-shaped container that needs to be covered in petroleum-based plastic. Give your answer rounded to the nearest thousand square millimetres (mm^2). (6)

3.1.3 The petroleum-based plastic that Wilmien will use to cover the containers is sold at R27,55/m^2. Calculate the cost to cover 50 of the rectangular-shaped containers with this plastic.

NOTE: The petroleum-based plastic can only be bought in whole square metres (m^2). (4)

3.1.4 Wilmien realised that she cannot fill the containers to maximum capacity. Instead, she fills the containers with coffee beans to a height that is 7% less than the container height.

Show that the height of the coffee beans in the cylindrical container is 11,2 cm. (3)

3.1.5 A sales representative advised Wilmien that the volume of the most economical container should not exceed 1 200 cm^3. Wilmien thus claim that the rectangular-shaped container would be the most economical.

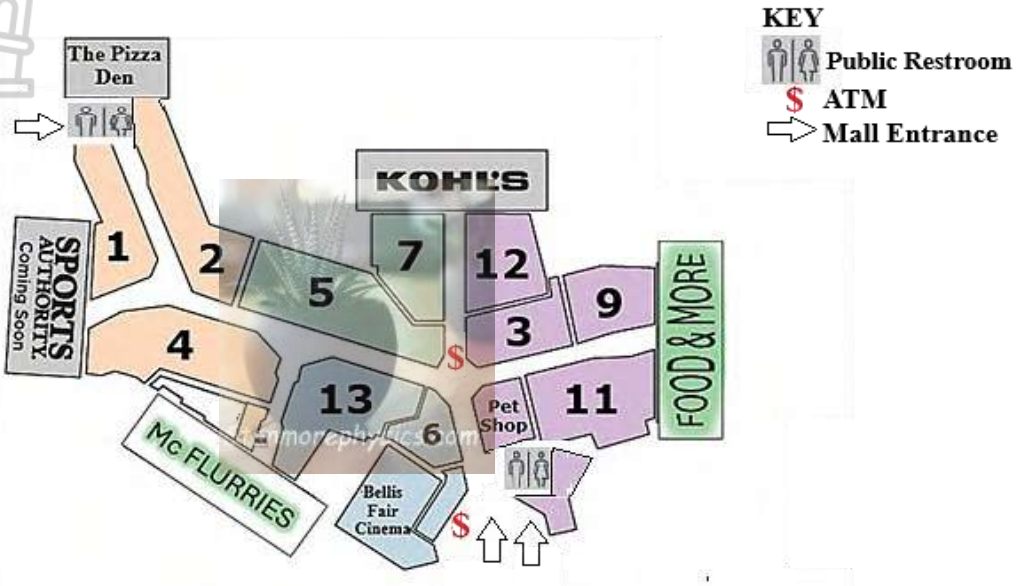
Verify, with the necessary calculations, whether Wilmien's claim is VALID. (5)

3.1.6 Provide ONE reason why Wilmien would want to wrap the containers in petroleum-based plastic. (2)

[23]

QUESTION 4

4.1 The layout plan of the shopping mall where Wilmien will be selling her imported coffee beans is shown below. Wilmien will only be selling to the stores that are numbered.



[Adapted from https://www.za.pinterest.com/pin/400257485606100702/]

Use the layout plan above to answer the following questions.

4.1.1 Determine the probability, as a percentage, that Wilmien will be selling her coffee beans to a store with an uneven number. (3)

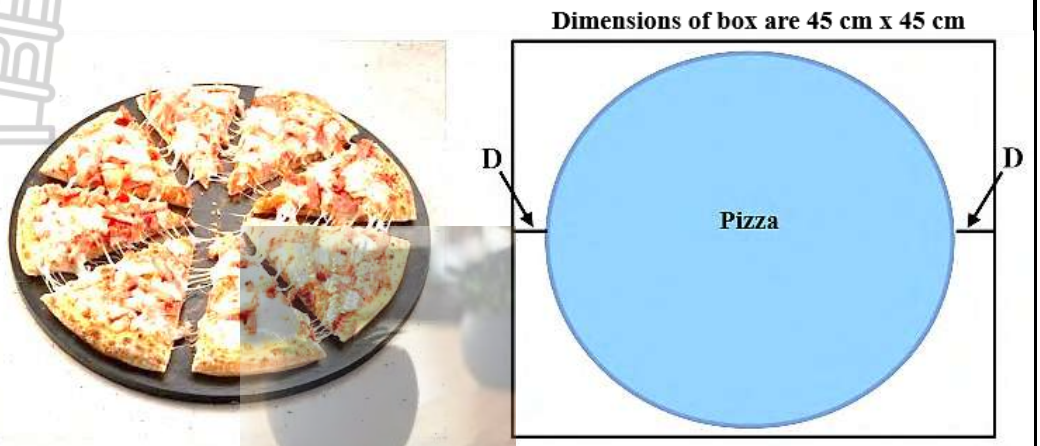
4.1.2 Wilmien arrived at the mall to do her deliveries at 08:30 and she concluded her delivery at 10:15. Wilmien claimed that she walked at an average speed of 1,4 miles per hour and thus covered a travelling distance inside the mall of more than 4 km. Verify, with the necessary calculations, whether Wilmien's claim is VALID.

NOTE: 1 mile = 1,60934 km

You may use the following formula: **Distance = Speed × Time** (7)

4.2 The Pizza Den is a new establishment inside the shopping mall that makes delicious pizzas. A picture of the sliced pizza and its packaging box is shown in the diagram below.

The pizza has a diameter of 42 cm.



[Adapted from www.googleimages.com/pizzaboxdimensions]

4.2.1 Determine the area of the pizza box, rounded to the nearest ten square centimetres (cm^2).

You may use the following formula:

Area of a square = side × side (3)

4.2.2 Determine the value of **D**. (3)

4.2.3 Calculate the area of one slice of the pizza if it is cut in eight equal slices as illustrated in the picture above.

You may use the following formula:

Area of a circle = π × radius², where **π = 3,142** (4)

4.3 The table used inside The Pizza Den where customers can enjoy their food is shown in ANNEXURE C. The tables are covered with PVC tablecloths with an overhang of 35 cm around the table.

Use ANNEXURE C to answer the following questions.

4.3.1 Calculate the radius of the plastic PVC tablecloth that is used to cover the tables. (3)

4.3.2 Calculate the height of the support pole (in cm) if the total height of the table is 78 cm. (3)

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TOTAL: 100

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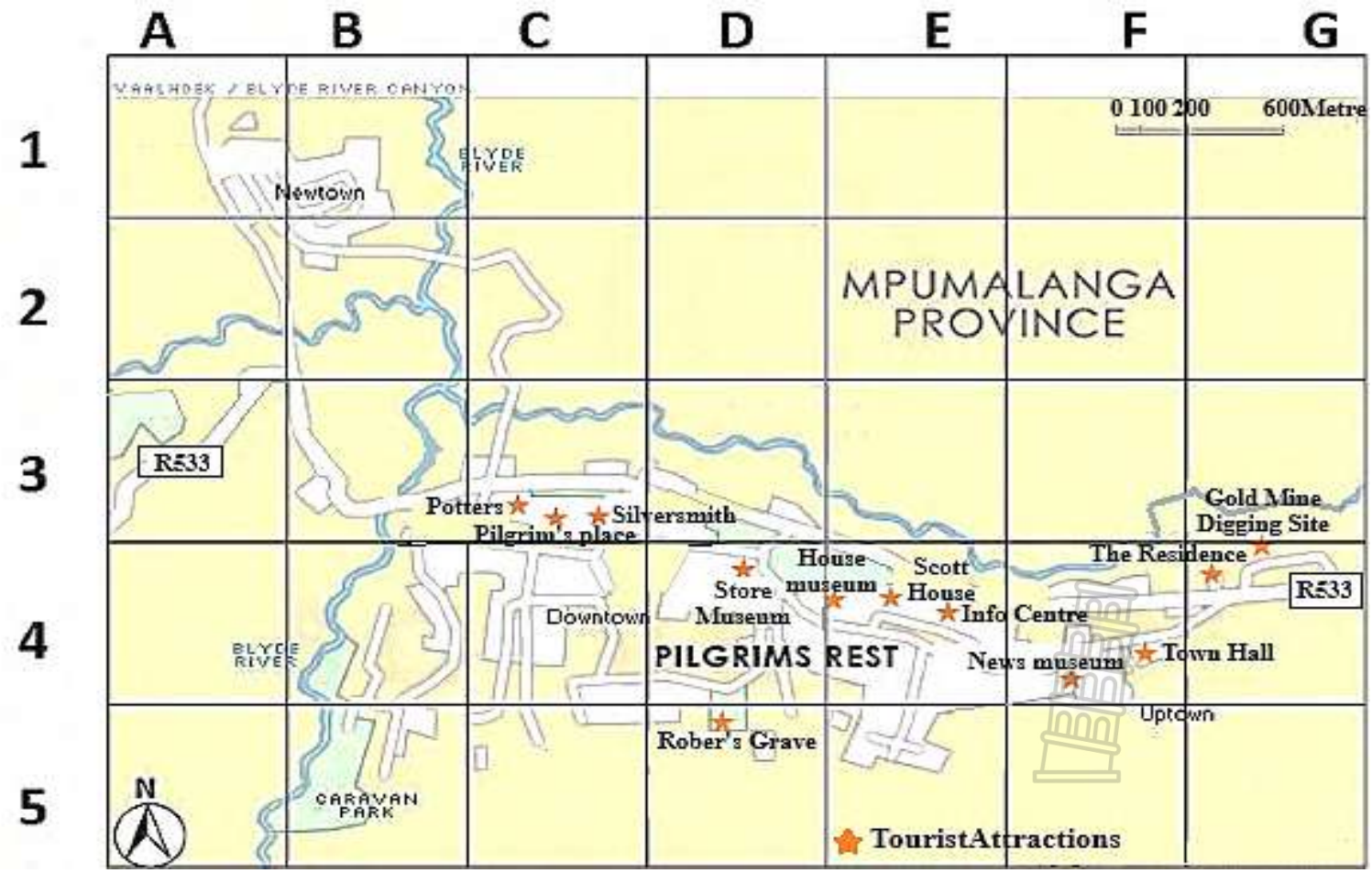
MATHEMATICAL LITERACY P2 ADDENDUM

This addendum consists of 4 pages with 3 annexures.

ANNEXURE A

QUESTION 2.1

MAP OF PILGRIM'S REST AND SURROUNDING AREAS IN MPUMALANGA, SOUTH AFRICA



[Adapted from www.sa-venues.com/2011]

ANNEXURE B: QUESTION 2.2

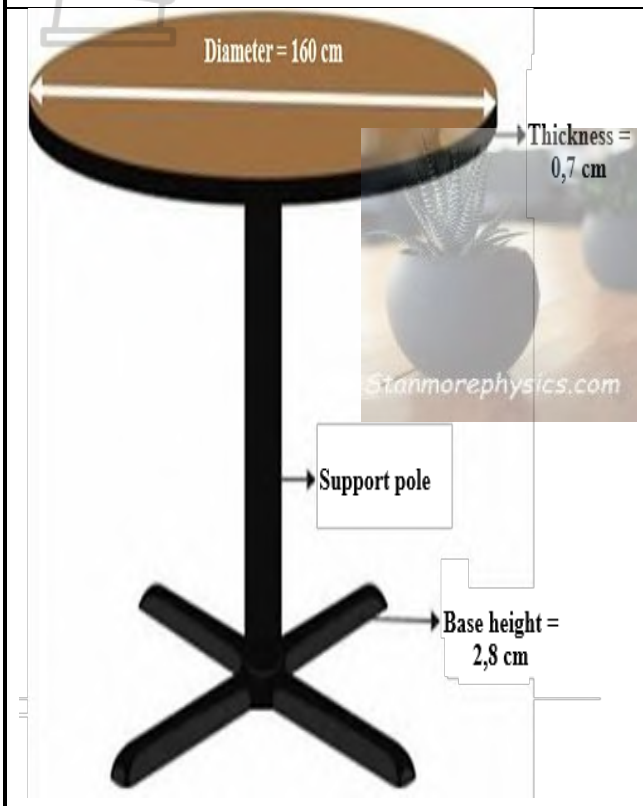
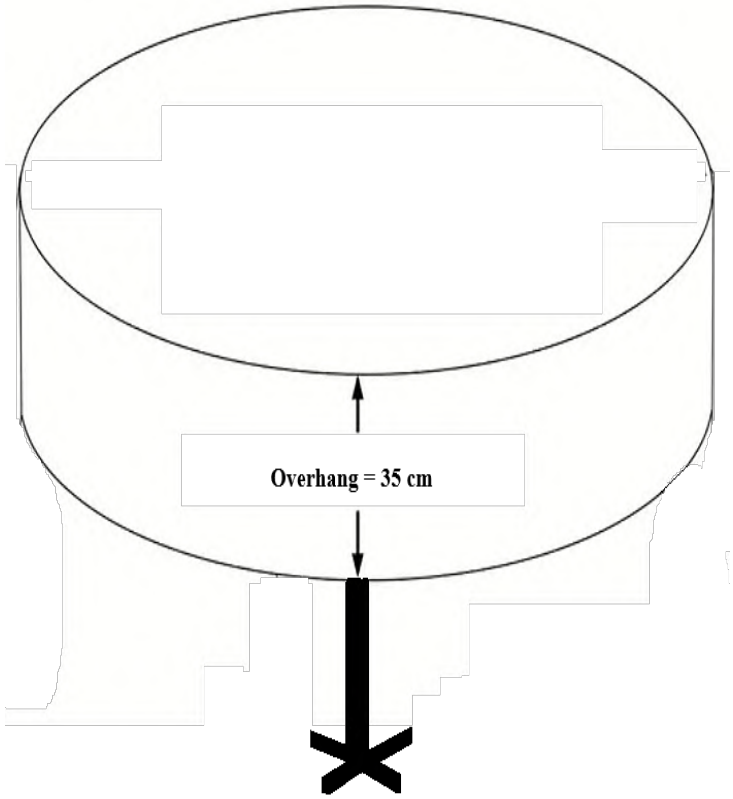
THE MAP OF MPUMALANGA AND SURROUNDING AREAS

[Adapted from www.roomsforafrica.com]

ANNEXURE C

QUESTION 4.3

DIAGRAMS OF THE TABLE AND TABLECLOTH USED INSIDE THE PIZZA DEN

DIAGRAM OF THE TABLE	ILLUSTRATION OF THE TABLECLOTH WITH OVERHANG
	

[Source: www.vectorstock.com]

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MATHEMATICAL LITERACY P2 MARKING GUIDELINES

MARKS: **100**

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT	Reading from a table/graph/diagram
SF	Correct substitution in a formula
O	Opinion/Explanation/Reasoning
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding Off/Reason
NPR	No penalty for correct rounding minimum two decimal places
AO	Answer only
MCA	Method with consistent accuracy
RCA	Rounding with consistent accuracy

This marking guidelines consist of 10 pages.

MARKING GUIDELINES

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 incorrect item presented.

KEY TO TOPIC SYMBOL:
F = Finance; M = Measurement; MP = Maps, plans and other representations; P = Probability

QUESTION 1 [24 MARKS] **ANSWER ONLY FULL MARKS**

Ques.	Solution	Explanation	Level
1.1.1	Total time = 1,5 minutes + 3 minutes + 15 minutes ✓M = 19,5 minutes ✓A	1M adding time 1A total time (2)	M L1
1.1.2	Cream cheese = $\frac{10 \text{ ounces}}{35,274}$ ✓C = 0,28349… ≈ 0,28 kg ✓A	1C dividing with 35,274 1A cream cheese in kg **NPR** (2)	M L1
1.1.3	Salt = 1½ × 5 ml ✓M = 7,5 ml ✓A	1M multiplying 1A correct answer (2)	M L1
1.1.4	°C = $\frac{5}{9}$ × (°F - 32) = $\frac{5}{9}$ × (356⁰ - 32) ✓SF = 180 °C ✓A	1SF substitution 1A temperature in °C (2)	M L1
1.2.1	Capacity refers to the maximum amount of liquid a container can hold. ✓✓A	2A correct definition (2)	M L1
1.2.2	Capacity = 500 ml ✓✓RT	2RT correct capacity (2)	M L1
1.3.1	Circumference of a circle = π × diameter = 3,142 × 13 ✓SF = 40,846 m ✓A	1SF substitution 1A circumference **NPR** (2)	M L1
1.3.2	Z : X 16 : 8 ✓A 2 : 1 ✓S If ratio swopped = 1 mark	1A correct ratio 1S simplification (2)	M L1
1.4.1	Oribi Animal Clinic ✓✓RT	2RT correct clinic (2)	MP L1
1.4.2	Southeast ✓✓A **OR** SE ✓✓A	2A correct direction (2)	MP L1

1.4.3	Travelling distance = 21,1 km × 1 000 ✓C = 21 100 m ✓A	1C multiply by 1 000 1A distance in m (2)	MP L1
1.4.4	Arrival time = 10:15 + :26✓M = 10:41 ✓A	1M adding time 1A correct time (2)	MP L1
		[24]	

QUESTION 2 [27 MARKS]			
Ques.	**Solution**	**Explanation**	**Level**
2.1.1	Rober's Grave ✓✓RT	2RT correct attraction (2)	MP L2
2.1.2	Probability = 0 ✓✓A **OR** None ✓✓A	2A correct answer (2)	P L2
2.1.3	Distance = 6,4 cm ✓✓A (Accept 6,2 cm – 6,6 cm)	2A correct distance (2)	MP L1
2.1.4	✓A Scale line = 2,6cm (**Accept 2,5 – 2,7 cm)** Scale $= \frac{2,6\text{ cm}}{2,6} = \frac{600\text{ m}}{2,6}$ ✓M = 1 cm : 230,7692308 m ✓CA Actual distance = 6,4 cm × 230,7692308 ✓MCA $= \frac{1\,476,923077\text{ m}}{1\,000}$ = 1,48 km ✓CA **OR** Scale line = 2,6 cm ✓A Scale = 2,6 cm = 600 m $= \frac{2,6}{2,6} : \frac{60\,000}{2,6}$ ✓M = 1 : 23 076,92308 ✓CA Actual distance = 6,4 × 23 076,92308 ✓MCA = 147 692,3077 cm $= \frac{147\,692,3077}{100\,000}$ = 1,48 km ✓CA	**CA from 2.1.3** 1A scale line in cm 1M dividing correct values 1CA scale 1MCA multiplication 1CA distance in km **OR** 1A scale line in cm 1M dividing correct values 1CA scale 1MCA multiplication 1CA distance in km **NPR** (5)	MP L3
2.1.5	No of people $= \frac{1\,721}{25,40}$ ✓M = 67,7559… ≈ 68 people ✓R **(Accept 67 people)**	1M dividing correct values 1R number of people (2)	MP L1
2.2.1	Mozambique ✓✓RT **OR** Swaziland ✓✓RT	2RT any correct country (2)	MP L1

2.2.2	6 national roads ✓✓RT	2RT no of national roads (2)	MP L2
2.2.3	Scale = 8,3 cm : 276 km = 276 km × 100 000✓C = 27 600 000 cm Scale = $\frac{8,3}{8,3} : \frac{27\ 600\ 000}{8,3}$✓M = 1 : 3 325 301,205✓CA	1C multiplying by 100 000 1M dividing distances 1CA scale **NPR** (3)	MP L2
2.2.4	Speed = $\frac{\text{Distance}}{\text{Time}}$ 80 km/h = $\frac{276\ \text{km}}{\text{Time}}$ ✓SF Time = $\frac{276\ km}{80\ km/h}$✓M = 3,45 hours✓CA = 0,45 × 60 = 27 minutes✓C Travel time = 3h27min Arrival time = 12:45 + 03:27✓M = 16:12✓CA ∴ Siphokhazi's claim is not valid✓O	1SF substitution 1M changing subject of formula 1CA time 1C converting hrs to min 1M adding time 1CA arrival time 1O opinion (7)	MP L4
		[27]	

QUESTION 3 [23 MARKS]			
Ques.	**Solution**	**Explanation**	**Level**
3.1.1	Radius $= \frac{50}{10} = 5$ cm ✓C Volume $= 3{,}142 \times 5^2 \times 12$ ✓SF $= 942{,}6$ cm^3 ✓CA	1C radius in cm 1SF substitution 1CA volume in cm^3 (3)	M L2
3.1.2	Width $= 0{,}08 \times 1\,000$ ✓C $= 80$ mm ✓A Height $= 14{,}5 \times 10$ $= 145$ mm ✓C TSA $= 2(150 \times 80) + 2(150 \times 145) + 2(145 \times 80)$ ✓SF $= 24\,000$ mm$^2 + 43\,500$ mm$^2 + 23\,200$ mm^2 $= 90\,700$ mm^2 ✓S $\approx 91\,000$ mm^2 ✓R	1C multiply by 1 000 1A width in mm 1C height in mm 1SF substitution 1S simplification 1R rounding (6)	M L3
3.1.3	Amount of plastic needed $= \frac{91\,000}{1\,000\,000}$ ✓C $= 0{,}091$ m$^2 \times 50$ ✓M $= 4{,}55$ m^2 ≈ 5 m^2 Cost of plastic $= 5$ m$^2 \times$ R27,55 ✓M $=$ R137,75 ✓CA	**CA from 3.1.2** 1C divide by 1 000 000 1M multiply by 50 1M multiply area with cost 1CA total cost (4)	M L3
3.1.4	Height $= \frac{7}{100} \times 12$ cm $=$ ✓M 0,84 cm ✓CA ∴ 12cm – 0,84 cm ✓M $= 11{,}16$ $\approx 11{,}2$ cm **OR** Height $= 100\% - 7\%$ ✓M $= 93\%$ ✓ CA ∴ $\frac{93}{100} \times 12$ cm ✓M $= 11{,}16$ cm $\approx 11{,}2$ cm	1M calculating 7% of 12 1CA answer 1M subtracting 7% from container height **OR** 1M subtracting 7% 1CA beans height in % 1M calculating 93% of 12 (3)	M L2

3.1.5	Volume of cylindrical-shaped container = 942,6 cm^3 Rectangular shaped container: Length = 15 cm ✓C Width = 8 cm ✓C Height = 14,5 cm Volume = L × W × H = 15 cm × 8 cm × 14,5 cm ✓SF = 1 740 cm^3 ✓CA Her statement is incorrect / not valid ✓O	1C length in cm 1C width in cm 1SF substitution 1CA volume in cm^3 1O opinion (5)	M L4
3.1.6	To keep the coffee beans fresh ✓✓O **OR** To protect container against breakage ✓✓O **(Accept any other relevant explanation)**	2O reason (2)	M L4
		[23]	

QUESTION 4 [26 MARKS]			
Ques.	**Solution**	**Explanation**	**Level**
4.1.1	Probability = $\frac{7}{11}$ ✓A × 100% ✓M = 63,64% ✓CA	1A correct fraction 1M multiply by 100% 1CA probability as a % (3)	P L2
4.1.2	Travelling time = 10:15 - 08:30 ✓M = 01:45 ∴ 0,45 ÷ 60 = 0,75 h ✓C Time = 1 h + 0,75 h = 1,75 hours ✓CA Distance = Speed × Time = 1,4 miles/h × 1,75 h ✓SF = 2,45 miles ∴ 2,45 miles × 1,60934 ✓C = 3,942883 km ✓CA Her statement is invalid ✓O **OR** Travelling time = 10:15 - 08:30 ✓M = 01:45 ∴ 0,45 ÷ 60 = 0,75 h ✓C Time = 1 h + 0,75 h = 1,75 hours ✓CA Speed = 1,4 miles/h × 1,60934 ✓C = 2,253076km/h Distance = Speed × Time = 2,253076km/h × 1,75 h ✓SF = 3,942883 km ✓CA Her statement is invalid ✓O	1M subtracting time 1C minutes to hours 1CA traveling time in hours 1SF substitution 1C multiply with conversion factor 1CA distance in km 1O opinion **OR** 1M subtracting time 1C minutes to hours 1CA traveling time in hours 1C convert speed to km/h 1SF substitution 1CA distance in km 1O opinion **NPR** (7)	MP L4
4.2.1	Area of square = side × side = 45 cm × 45 cm ✓SF = 2 025 cm^2 ✓A ≈ 2 030 cm^2 ✓R	1SF substitution 1A area of box 1R rounding (3)	M L2
4.2.2	Value of D: 2D = 45 cm – 42 cm ✓M = 3 cm D = $\frac{3\ cm}{2}$ ✓M = 1,5 cm ✓CA	1M subtraction 1M divide by 2 1CA value of D (3)	M L2

4.2.3	Area of pizza (circle) $= 3{,}142 \times 21^2$ ✓A ✓SF $= 1\ 385{,}622\ cm^2$ Area of one slice $= \frac{1\ 385{,}622}{8}$ ✓M $= 173{,}20\ cm^2$ ✓CA	1A radius 1SF substitution 1M dividing area by 8 1CA area of one slice (4)	M L3
4.3.1	Diameter = 160 cm + 35 cm + 35 cm ✓M = 230 cm Radius $= \frac{230}{2}$ ✓M = 115 cm ✓CA	1M adding correct values 1M divide diameter by 2 1CA radius (3)	M L2
4.3.2	Height of support pole = 78 cm ✓M – (2,8 cm + 0,7 cm) ✓M = 74,5 cm ✓CA	1M subtraction 1M adding base and thickness 1CA height in cm (3)	M L2
		[26]	
		TOTAL: 100	