Please paste the barcoded label here	TOTAL MARKS

NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2023

MATHEMATICAL LITERACY: PAPER II

EXAMINATION NUMBER													

Time: 3 hours 150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 24 pages and an Insert of 2 pages (i–ii).
2. Please check that your question paper is complete.
3. Answer ALL five questions.
4. **Answer ALL the questions on the question paper and hand it in at the end of the examination. Remember to write your examination number in the space provided.**
5. It is strongly recommended that all working details be clearly shown where necessary.
6. An approved non-programmable calculator may be used where necessary.
7. It is in your own interest to write legibly and to present your work neatly.
8. Maps and diagrams are not necessarily drawn to scale, unless otherwise stated.
9. ONE blank page (page 24) is included at the end of the question paper. If you run out of space for a question, use this page. Clearly indicate the question number of your answer should you use this extra space.

Question	1		2		3		4		5		Total	
	Marker	Mod	Marker	Mod	Marker	Mod	Marker	Mod	Marker	Mod	Marker	Mod
Mark												
Signature												
Total	30		31		30		28		31		150	

QUESTION 1

All bakers must try Aero baking chocolate. Specifically made for baking, you can now add the wonderful Aero bubbles to all your decadent treats! Aero baking chocolate (175 g) is premeasured and quick to melt.

Answer the following questions:

1.1 Study the diagram illustrating the premeasured divisions of the first 3 bars of the 'Aero for baking' chocolate slab given below and answer the questions that follow:

5 g	5 g	5 g	5 g	5 g
15 g			10 g	
25 g				

1.1.1 Convert the full weight of the chocolate slab to kilograms.

_____

_____

(2)

1.1.2 How many grams does each bar of the chocolate slab measure as?

_____

_____

(2)

1.1.3 What fraction of the full chocolate slab does one bar of the chocolate slab make?

_____

_____

(2)

1.1.4 Write the fraction from **Question 1.1.3** as a percentage, rounded off to one decimal place.

_____

_____

(2)

1.2 Many delicious recipes using 'Aero for baking' chocolate slabs are available on Facebook (https://www.facebook.com/AerobakingSA/).

Once such recipe is for Aero Chocolate Fudge.

1.2.1 The written and visual instructions for making Aero Chocolate Fudge is given below.

Match the visual instructions, **A** to **F**, to each written instruction by completing the table at the end of this question.

1. Collect and measure out one slab of 'Aero for Baking' (175 g) and one cup of cream.
2. Place the ingredients in a heat-resistant dish.
3. Heat the ingredients over a low heat until the mixture is melted and mixed together.
4. Pour the mixture into a 22 cm by 22 cm baking tin.
5. Spread and level the mixture into the baking tin and place in the fridge until cooled and solid.
6. Once the mixture has cooled, cut the Aero Chocolate Fudge and enjoy the deliciousness.

A

B

C

D

E

F

1.		4.	
2.		5.	
3.		6.	

(6)

1.2.2 Study the cake tin below and answer the questions that follow:

(a) Complete the calculations given below to calculate the volume of $\frac{1}{3}$ of the cake tin. Give the solution to the nearest 10.

$\frac{1}{3}$ Volume = $\frac{1}{3}$ × ☐ × 22 × ☐ = ☐

= ☐

(3)

(b) The correct unit of measurement for volume is (circle the correct answer):

A cm
B cm^2
C cm^3

(2)

(c) Would a cake baked in the cake tin above, fit in a box with dimensions 7,5 inches by 7,5 inches? Complete the calculation below to answer this question if 1 inch = 2,54 cm:

7,5 inches ☐ 2,54 cm (insert the correct Mathematical Function)

= ☐ cm

The cake **WILL/WILL NOT** fit in a 7,5 × 7,5 inch box.
(Using the calculation above, circle the correct option in bold to make this statement true).

(3)

1.3 The ingredients for another recipe using Aero chocolate is given below. Read the ingredients carefully and answer the questions that follow:

No-bake Cheesecake

INGREDIENTS FOR CHEESECAKE:

2 × 250 g packet choc ripple biscuits
250 g unsalted butter
100 g dark cooking chocolate
7 × 40 g packet Aero Peppermint bar
1 tbsp gelatine powder
2 tbsp boiling water
2 × 250 g packet cream cheese
155g (¾ cup) castor sugar
250 ml (1 cup) thickened cream
2 tsp peppermint essence
180 g packet Chocolate Balls Milk Chocolate

1.3.1 If one tablespoon (tbsp) = 15 ml and one teaspoon (tsp) = 5 ml, calculate how many teaspoons of boiling water is needed for this recipe.

(2)

1.3.2 If 155 g = $\frac{3}{4}$ cup of castor sugar, determine how many grams are in one cup.

(2)

1.3.3 What is the total amount (in grams) of Aero Peppermint bar required?

(2)

1.3.4 One packet of Crunchy Chocolate Balls Milk Chocolate contains 15 chocolate balls. What does each chocolate ball weigh?

(2)
[30]

QUESTION 2

Mountain biking is a sport of riding bicycles off-road, often over rough terrain, usually using specially designed mountain bikes.

2.1 Such a mountain bike is depicted below:

2.1.1 State the radius of the wheel in cm indicated with the arrow labelled **A** (orange arrow).

(2)

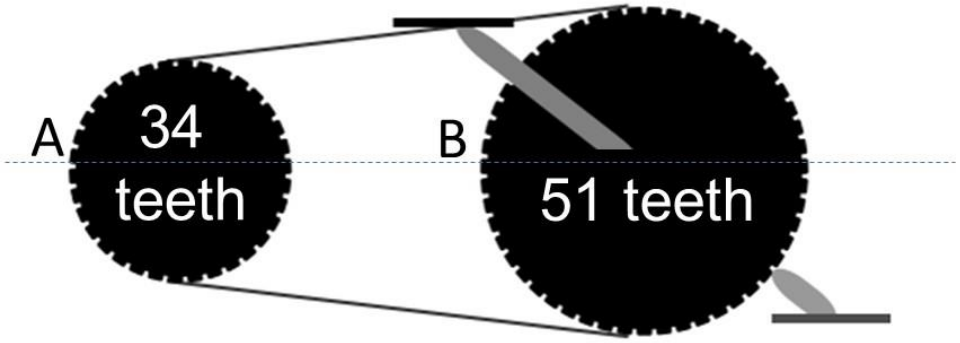
2.1.2 Determine the distance (in metres to 7 significant figures) a mountain bike can travel on one rotation of the wheel.
Use the formula: *Distance of ONE rotation = 2 × 3,142 × radius.*

(4)

2.1.3 A cyclist will travel 21,2 km on his mountain bicycle. Determine how many times a wheel would rotate to complete this trip.

(4)

2.1.4 The number of teeth on the small and large cogs on a bicycle are shown below. Study the diagram and answer the questions that follow:



(a) Write the ratio of number of teeth on the small cog to the number of teeth of the big cog in simplest unit.

(2)

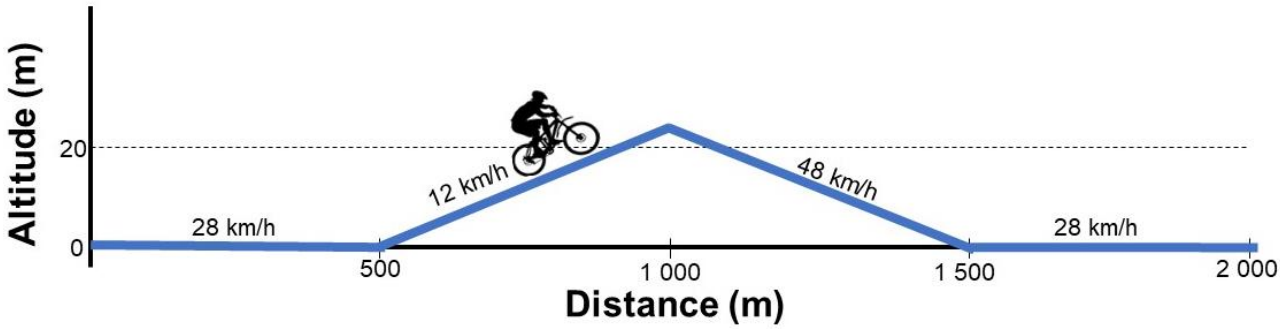
(b) Calculate the minimum number of rotations the small and large cog must make to line the two cogs up in the exact position it was in when the rotation started, i.e. point A lines up with point B.

(4)

2.2 The Cederberg Mountain Bike Route is a 21,2 km route near Citrusdal in the Western Cape and takes an average of 5 hours and 4 minutes to complete.

A short section of the trail is depicted in the graph below.

Study the graph carefully and answer the questions that follow:



2.2.1 Determine the average speed this cyclist cycles to complete this section of the route.

_____

_____

(3)

2.2.2 Complete the calculations to show how long it would take the cyclist to cycle the first 500 m.

Time = 500 m ÷ 28 km/h

= _____ km ÷ 28 km/h

= _____ hours

= _____ hours _____ minutes

(4)

2.2.3 Calculate what fraction of the total length of time of this route is taken up during the section shown on the graph.

_____

_____

_____

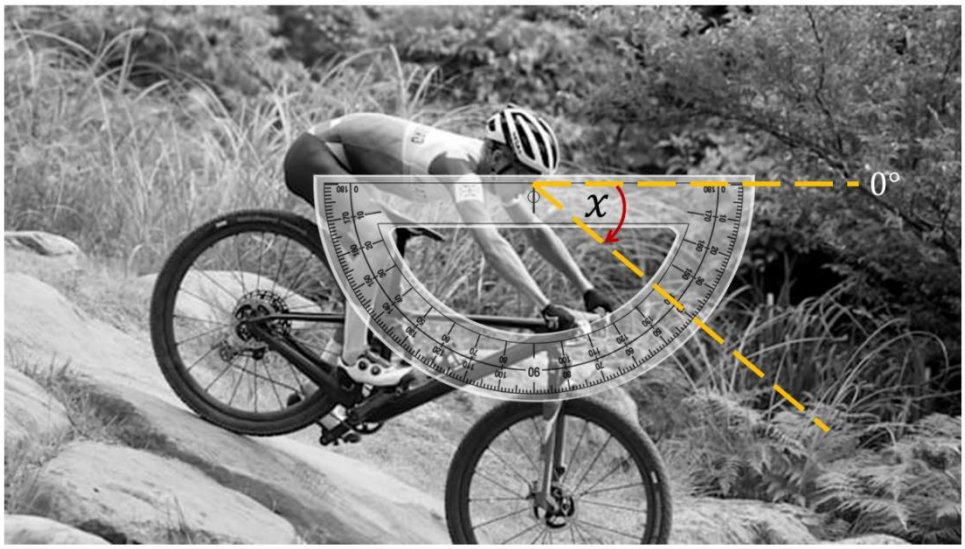
_____

_____

_____

(6)

2.3 When riding downhill, the cyclist looks down creating an angle labelled x.



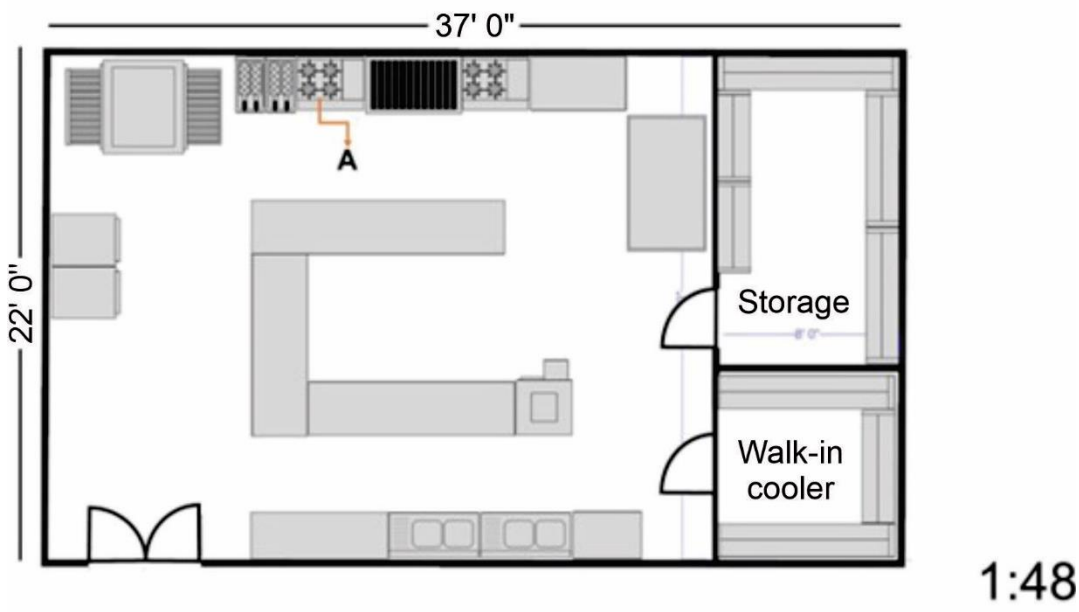
Using the protractor, measure the angle labelled x in the image above.

(2)
[31]

QUESTION 3

A soup kitchen is a place where free food (usually soup and bread) is served to the homeless and destitute without judgment or discrimination. These places are usually run by charitable or religious organisations and staffed by volunteers.

3.1 Study the floor plan for a soup kitchen given below.



Answer the questions that follow:

3.1.1 What is represented on the floor plan on **A**?

_____

_____

(2)

3.1.2 If it is given that one foot = 30,48 cm, determine the floor area (in m^2) of the kitchen.

_____

_____

_____

_____

_____

_____

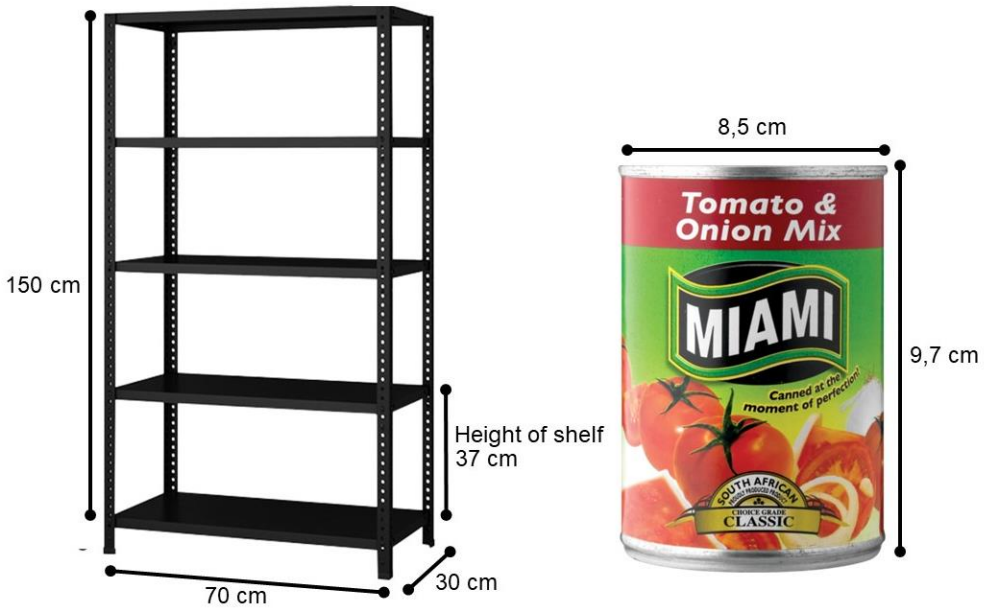
(5)

3.1.3 The walk-in cooler should be kept between 35 ºF to 45 ºF. Using the formula, convert 35 ºF to ºC.

ºF = 1,8 ºC + 32

(3)

3.2 The storage room holds shelves where stock is stored until needed. A donation of 144 Tomato & Onion Mix tins was given to a local soup kitchen.



Show that the donation will fill 2 shelves if the tins are packed in neatly stacked rows.
Note: Each shelf is 37 cm high.

(8)

3.3 Large pots, similar to the one below, are used to prepare soups at a soup kitchen.

3.3.1 Calculate the thickness of the metal side of the pot.

(3)

3.3.2 By calculating the volume of the pot, determine how many bowls of soup can be served from such a pot.

Note:
- Volume of a cylinder = 3,142 × radius × radius × height
- Each soup bowl contains 400 ml of soup.
- 1 cm^3 = 1 ml.

(6)

3.3.3 How many FULL pots of soup must be cooked to help 240?

(3)
[30]

QUESTION 4

Hot-air ballooning in South Africa is arguably the best way to take in the landscapes of this beautiful country. Floating high above the ground, you have a spectacular, uninterrupted view of the gorgeous countryside below.

4.1 Going on a hot-air balloon ride is very dependent on the weather. In the month of May, the weather forecast gave the prediction illustrated in the table below. The probability for two weather forecasts has been omitted.

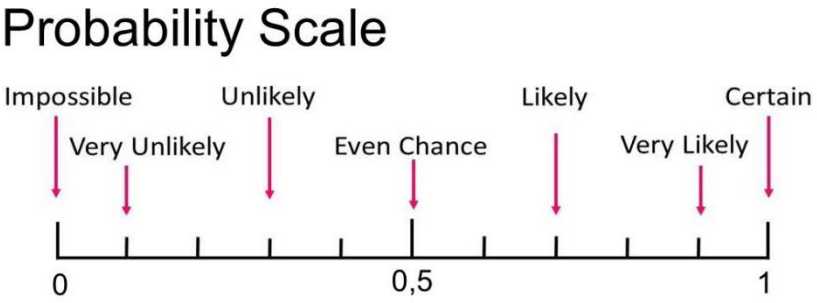
WEATHER FORECAST	Sunny	Cloudy	Partially Cloudy	Rainy
PROBABILITY	$\frac{1}{2}$		$\frac{1}{5}$	

If the forecast can only be one of the four forecasts shown in the table, answer the following questions.

4.1.1 If the probability for rain is double that of cloudy, determine the probability of the two missing weather forecasts, clouded or rainy, as a percentage.

(4)

4.1.2 Illustrate the various probabilities of the four weather forecasts on the probability scale below by illustrating an **A** for Sunny, **B** for Cloudy, **C** for Partially Cloudy and **D** for Rainy.



(4)

4.2 'Hot-Air Ballooning SA Experience' provides hot-air balloon rides from the airport just outside Parys in the Free State.

Look at the map given below and answer the questions that follow:

4.2.1 Which province lies north of this section of the Vaal River?

_____

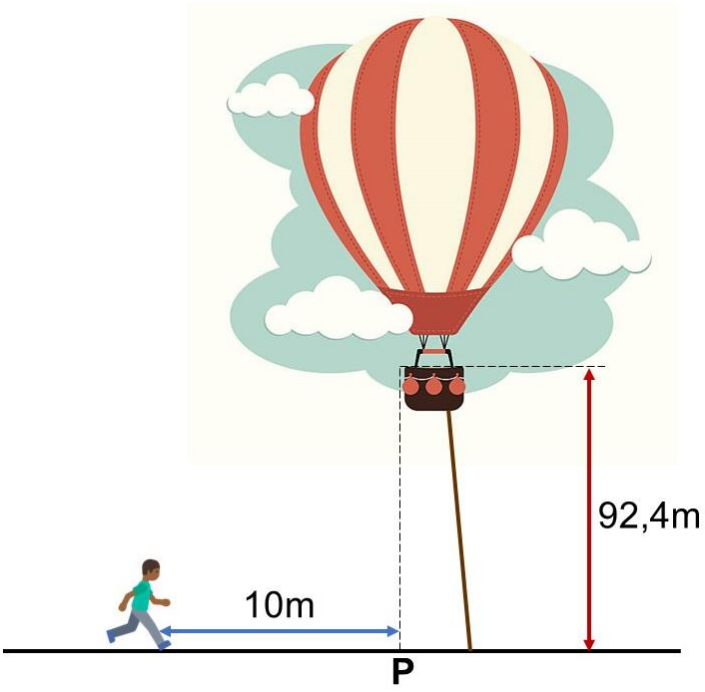
(2)

4.2.2 Which national road runs from Kroonstad to Johannesburg?

_____

(2)

4.3 A hot-air balloon has a 'tether' line (a rope that keeps the balloon attached to the ground).



4.3.1 If a hot-air balloon rises 2,4 m/sec, how high will the balloon be in 5 seconds?

(2)

4.3.2 Kate accidentally dropped her camera from the balloon at a height of 92,4 m as shown in the diagram above. The camera hits the ground after 6 seconds.

A spectator starts to run as the camera starts to fall from the balloon. He runs at a constant speed of 2 meters per second. He is 10 m away from the balloon.

Will he be able to reach the camera before it strikes the ground?

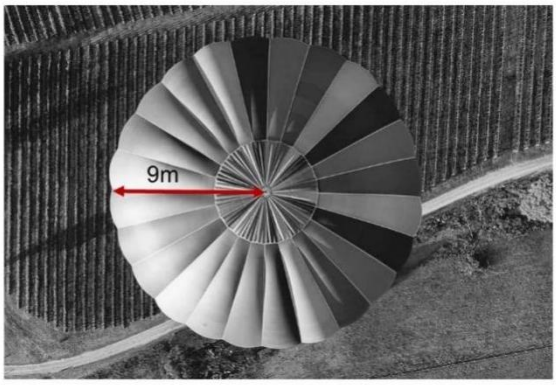
(3)

4.3.3 At one point during the ride as the balloon descends, Kate asked the pilot how high up they were. The pilot smiled and said that the tether line was 12 times his height. When Kate asked the pilot how tall he was, he said he was 1,9 m tall.

How high did the hot-air balloon's tether line reach into the air?

(3)

4.3.4 The radius of the hot-air balloon is 9 m at its widest point. How wide is the balloon?



(2)

4.3.5 Kate's ride lasted one and a quarter hours. How many minutes was her ride?

(2)

4.4 The air in a typical hot-air balloon may be heated to 100 ºC above ambient temperature (the air temperature on the day).

4.4.1 If the temperature on the day of Kate's flight was 23 ºC, calculate the maximum temperature the hot-air balloon may be heated to.

(2)

4.4.2 The formula to convert °C to °F is given as ºF = $\frac{9}{5}$ (°C) + 32 **or** °F = 1,8 (ºC) + 32. Write 1,8 as an equivalent fraction of $\frac{9}{5}$ to show that these two formulas are the same.

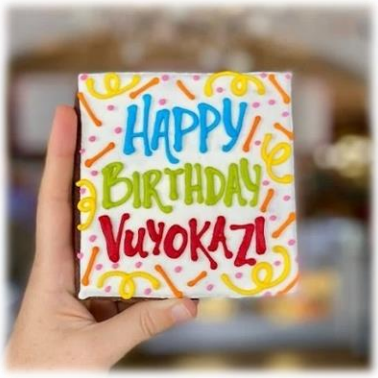
(2)
[28]

QUESTION 5

Charly's Bakery, in Cape Town, specialises in designer cakes for all occasions, as well as a range of fun and bright cupcakes, petit fours and 'koekies' (biscuits).

NOTE: petit four – a very small fancy cake, typically made with marzipan and served after a meal.

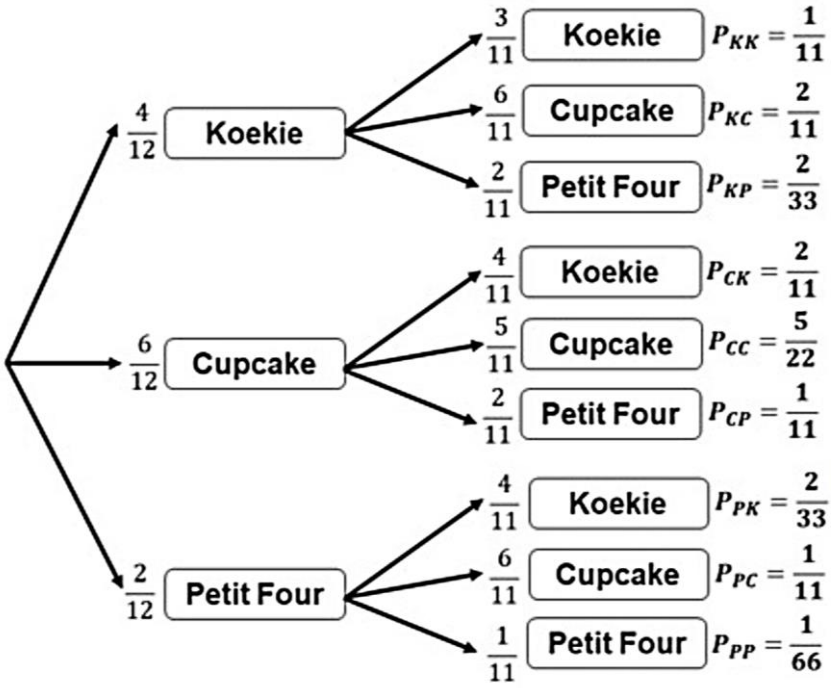
5.1 Koekies are very popular at the bakery. The koekie below is 12 cm by 12 cm in size.



Draw a scale drawing of the koekie using a scale of 1 : 3.

(2)

5.2 Amy-May bought a mixed box of treats containing 4 koekies, 6 cupcakes and 2 petit fours. The tree diagram below illustrates the probabilities of randomly selecting two treats from this box.



Study the tree diagram and answer the questions that follow:

5.2.1 If Amy-May picked one of the products from the box without looking, what is the percentage probability that she would pick a cupcake?

(2)

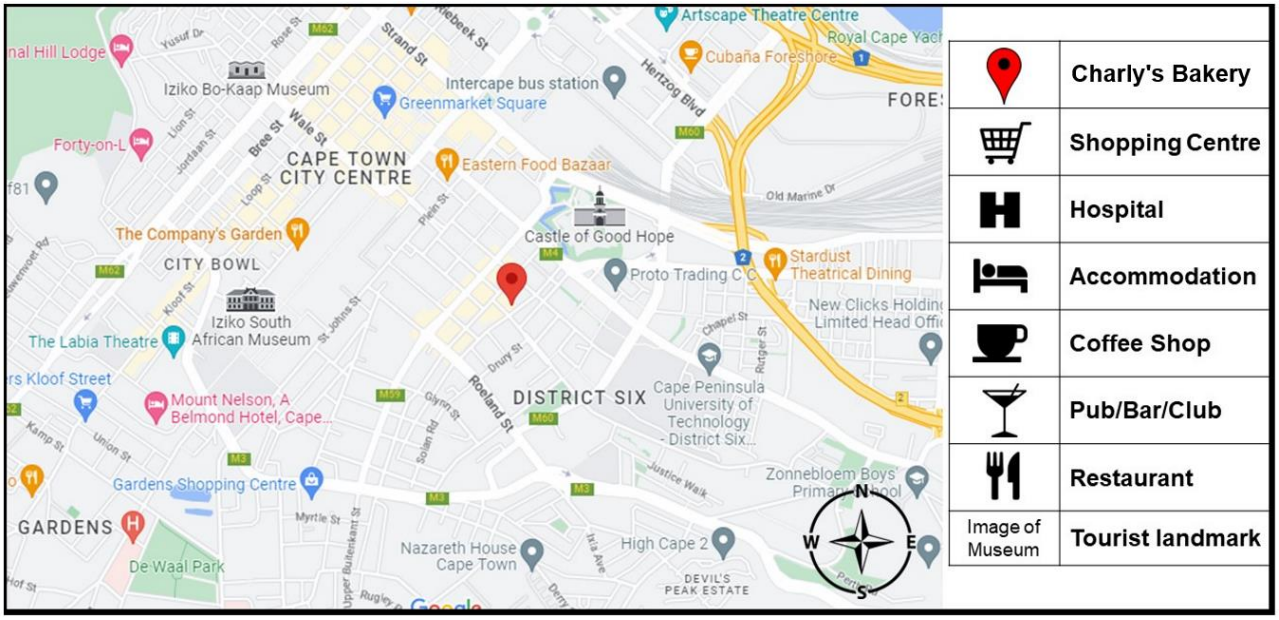
5.2.2 Explain why on the tree diagram on the first branch, the probability of picking a koekie as her second treat is $\frac{3}{11}$.

(2)

5.2.3 Show how the probability of picking two koekies in succession was calculated.

(2)

5.3 A map of Cape Town's City Centre is given below. Look at the map and answer the questions that follow. There is a bigger version of this map on page i of the Insert.



5.3.1 How many tourist landmarks are depicted on the map?

_____

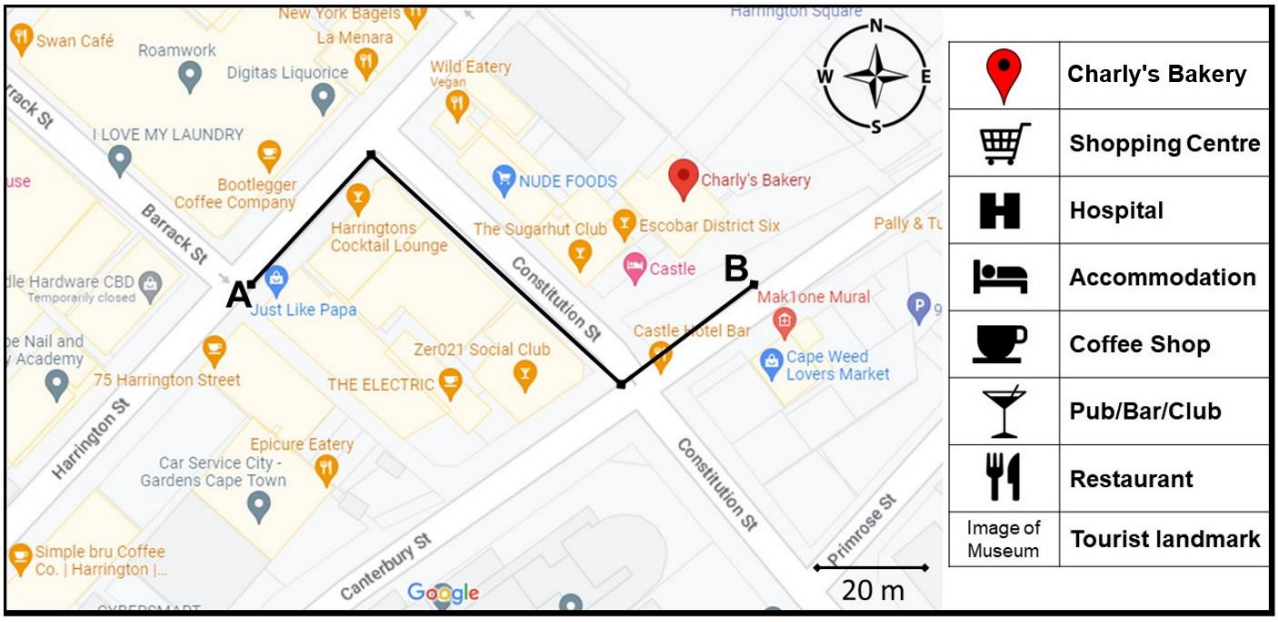
(2)

5.3.2 Which tourist landmark lies in a Northeasterly direction from Charly's Bakery?

_____

(2)

5.4 A zoomed-in street map is given below. There is a bigger version of this map on page ii of the Insert.



5.4.1 What street is Charly's Bakery in (point B)?

_____

(2)

5.4.2 How many restaurants are depicted on the map?

_____

(2)

5.4.3 Amy-May was dropped off at point A and walked along the sidewalk to Charly's Bakery (point B).

(a) Which street would Amy-May have to cross while on her way to Charly's Bakery?

_____

(2)

(b) Calculate the distance Amy-May has to walk using the bar scale provided on the map.

_____

_____

_____

_____

_____

_____

(4)

(c) Google Maps says she is 120 m from Charly's Bakery. Show that if Amy-May walked at a speed of 0,24 km/h and she was dropped off at 12:10 that she would arrive at Charly's Bakery by 12:40.

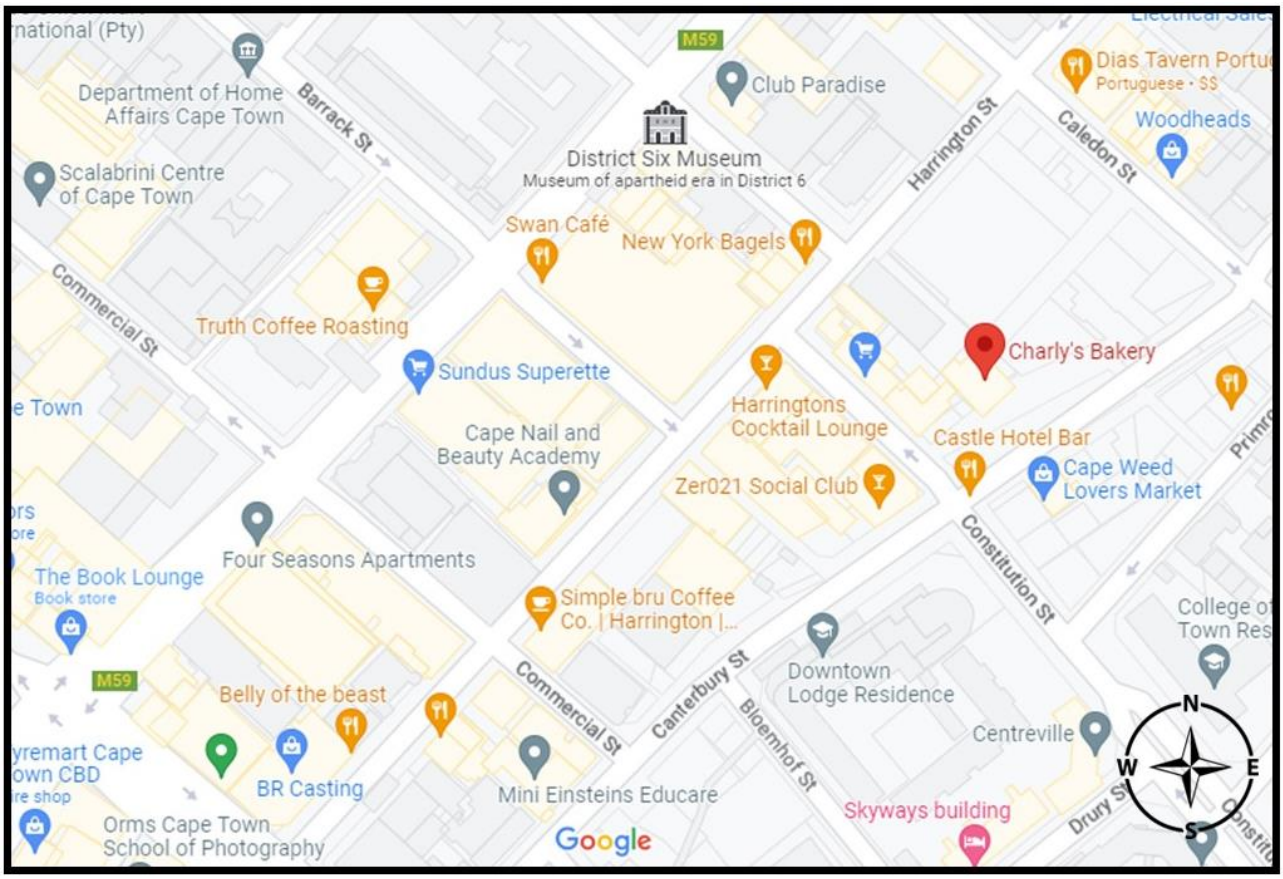
(4)

5.4.4 Study the next graph of the streets of Cape Town and answer the question that follows.

Amy-May was given directions to the Parliament building (the map) as follows:

- Outside Charly's Bakery, face Southeast.
- Turn right and follow a Southwesterly direction along Canterbury Street.
- Turn right onto Constitution Street.
- At the T-junction turn left onto Harrington Street.
- Turn right in a Northwesterly direction at the next road.
- Continue half-way up the second block to reach your destination.

Illustrate these instructions on the map given below with a pen or highlighter.



(5)
[31]

Total: 150 marks

ADDITIONAL SPACE (ALL QUESTIONS)

ADDITIONAL SPACE TO ANSWER QUESTIONS. REMEMBER TO CLEARLY INDICATE AT THE QUESTION THAT YOU USED THE ADDITIONAL SPACE TO ENSURE THAT ALL ANSWERS ARE MARKED.