Please paste the barcoded label here	TOTAL MARKS

NATIONAL SENIOR CERTIFICATE EXAMINATION
MAY 2024

MATHEMATICAL LITERACY: PAPER II

EXAMINATION NUMBER													

Time: 3 hours 150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of:
   - 28 pages which includes 2 additional pages at the end for rough work and calculations if necessary.
   - 5 questions.
2. Please check that your question paper is complete.
3. **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.**
4. It is strongly recommended that all working details be clearly shown where necessary.
5. An approved non-programmable calculator may be used where necessary.
6. It is in your own interest to write legibly and to present your work neatly.
7. Maps and diagrams are not necessarily drawn to scale, unless otherwise stated.
8. TWO blank pages (page 27 to 28) are included at the end of the question paper. If you run out of space for a question, use these pages. 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		30		30		29		31		150	

QUESTION 1

The Village Square is a modern community Shopping Centre situated in St Francis Bay in the Eastern Cape.

1.1 Study the floor plan below and answer the questions that follow:

STORE DIRECTORY

6 Haywire Electrical
7 Verve Boutique
8 Stationery Butler
10 Shakti Shanti Clothing
11 True Technologies
12 Silver for You
15 Biltong and Braai
16 Fine and Country Real Estate
17 Love that Clothing
20 The Stone Artistic Network Program
42 Bean Tree Coffee Kiosk

1.1.1 Which store has the biggest floor area?

_____

(2)

1.1.2 How many ATMs are available on this floor of the Shopping Centre?

_____

(2)

1.1.3 The seating area is a square with an area of 121 m². Determine the length of the square area.

(2)

1.1.4 The width of the Jungle Gym and Swings Area is the same as that of the Seating Area. If the ratio of the width to the length of the Jungle Gym and Swings Area is 10 : 13, calculate the length of the Jungle Gym and Swings Area.

(2)

1.2 Store 42 is a Spar's Bean Tree Coffee Kiosk and offers an array of coffees, sandwiches, and muffins in a variety of sizes.

The different coffee cup sizes are shown below.

Answer the questions that follow:

1.2.1 Write the ratio of the second smallest cup to that of the largest cup in simplest form.

(2)

1.2.2 The barista mixes 20 grams of espresso and 120 ml of milk in a 1 : 6 ratio, but realizes that he needs to make 500 ml of coffee. Determine how much milk is needed to make this cup of coffee. Round your answer to the nearest 10 ml.

(4)

1.2.3 A 250 ml cup of coffee cost R24. This equates to R0,096/ml. By completing the calculations below, determine whether a 350 ml cup of coffee costing R30 is a cheaper option per millilitre than a 250 ml cup of coffee.

R30 ☐ 350 mℓ

= R ☐ / mℓ

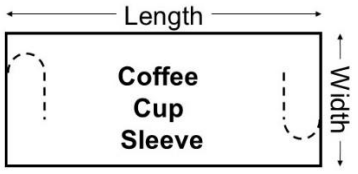
A 350 ml cup of coffee is a cheaper option (select the suitable conclusion).

☐ **YES**

☐ **NO**

(3)

1.2.4 At the Bean Tree, a takeaway cup has a Coffee Cup Sleeve slipped over the outside of the cup as illustrated below.



The relationship between the area, length and width of the rectangle is shown below.

AREA:	1 200 cm²	1 200 cm²	1 200 cm²	1 200 cm²	1 200 cm²	1 200 cm²	1 200 cm²
LENGTH:	10	12	15	20	30	40	50
WIDTH:	120	100	80	60	40	30	24

Is this relationship an example of direct or inverse proportion?

(2)

1.3 A customer has a cylindrical flask as illustrated below. Answer the questions that follow:

1.3.1 This flask holds two 500 ml cups of coffee. How many litres does this flask hold?

(2)

1.3.2 Give the radius of the cylindrical flask.

(2)

1.3.3 Which formula below will calculate the volume of this flask, where r = radius and h = height?

A $2\pi r^2 \times h$
B $2\pi r \times h$
C $\pi r^2 \times h$ (2)

1.3.4 If the approximate volume of the flask is given as 1 021, give the appropriate unit of measurement.

(2)

1.4 Two tablespoons of ground coffee are equivalent to 76 coffee beans and would make 3 cups of coffee. Determine how many cups of coffee can be made with 228 coffee beans.

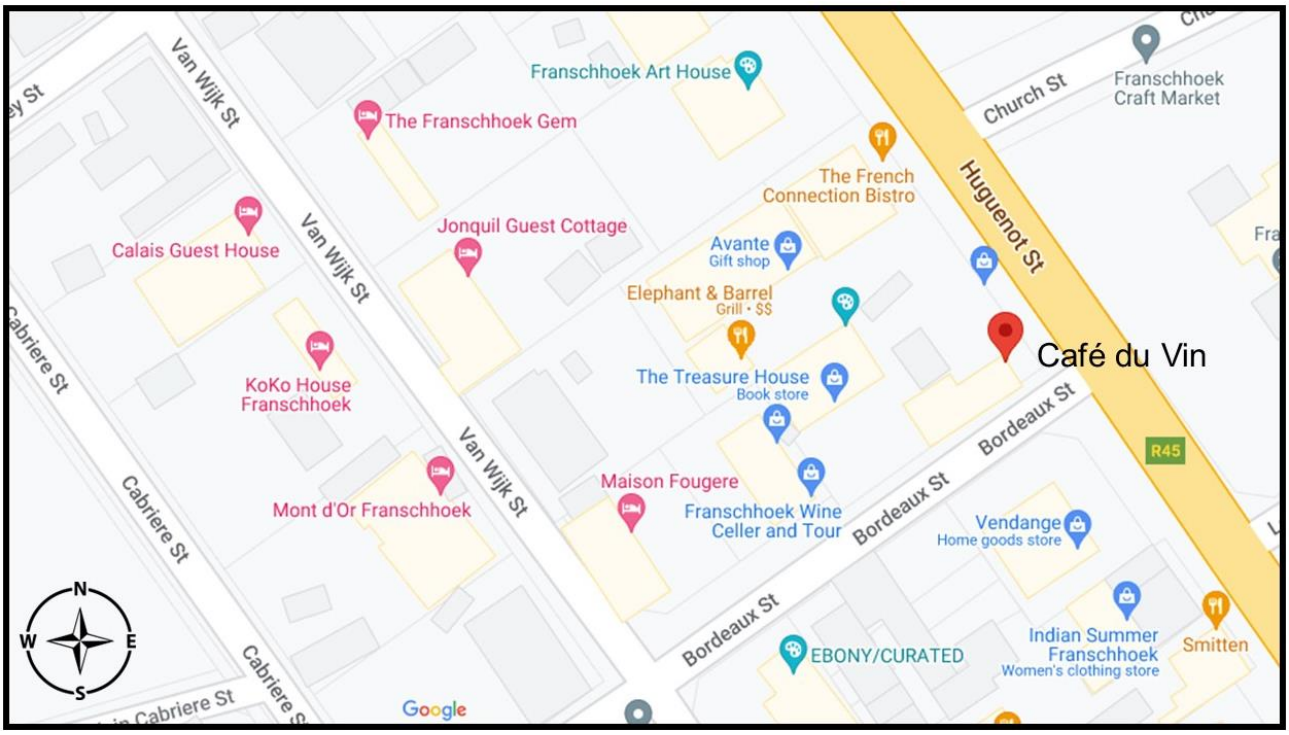
(3)
[30]

QUESTION 2

Veronica owns Batter & Crumbs Vegan Baking Company in Franschhoek in the Western Cape.

She bakes biscuits and cupcakes for various Guest Houses and Cafés and also sells glass jars of ingredients ideal for gifts.

2.1 Study the map of Franschhoek below and answer the questions that follow:



[Resource: Google Maps]

2.1.1 What does the Google Map icon  indicate?

_____

(2)

2.1.2 Assume the Google Maps icon  indicates the guest houses that purchase baked goods from Veronica. How many guest houses are indicated on the map?

_____

(2)

2.1.3 Café du Vin lies on the corners of _____ St and _____ St. (2)

2.1.4 State the general direction of Calais Guest House from Café du Vin.

_____

(2)

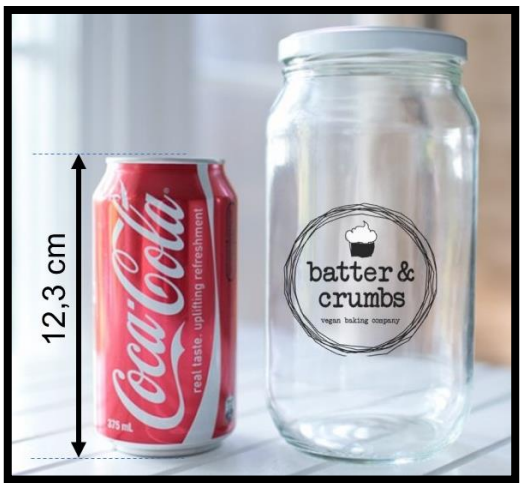
2.2 The ingredients for Vegan Chocolate Oatmeal Cookies are given below. Study the ingredients and answer the questions that follow:

Various dry and wet ingredients have different masses. By completing the given conversion table below, determine the mass of the jar.

Ingredients	**Mass**	**Quantity**	**TOTAL MASS**
1 cup of flour	85 g	1	
1 cup of sugar	201 g		150,75 g
1 cup of oats	136 g	1	136,00 g
1 cup of cranberries or chocolate chips	100 g	$\frac{3}{4}$ cups	
1 cup of sunflower oil	227 g		
1 teaspoon (baking powder, baking soda, salt, ground cinnamon)	5 g	2,5 tsp	
1 tablespoon (cocoa powder, chia seeds)	15 g	4	60g
TOTAL MASS OF GLASS JAR:			

(7)

2.3



Calculate the height of the glass jar by increasing the height of the can in a ratio of 2 : 3.

(3)

2.4 Veronica sells the biscuits, shown below, to Café du Vin in the shown box for R20,80.

Show that each biscuit costs R1,30 if the height of each biscuit is 0,85 cm and the box is only filled to 80% capacity.

(8)

2.5 Veronica also sells packs of 12 cookies at a local craft market. There are 9 chocolate chip cookies and 3 peanut butter cookies.

2.5.1 If there is an equal chance of selecting any cookie, what is the probability of randomly selecting a peanut butter cookie?

A Likely
B Unlikely
C Certain
D Impossible (2)

2.5.2 Which type of cookie has the highest probability to be picked at random?

_____

(2)
[30]

QUESTION 3

Nieu-Bethesda

Nieu-Bethesda is a village in the Eastern Cape approximately 50 kilometres north of Graaff-Reinet. The village was founded in 1875 as a church town like many other Karoo villages.

3.1 The directions from Graaff-Reinet to Nieu-Bethesda are given below:

- From the centre of town, take Murray St to the N9 – duration: 5 min (2,0 km)
- Continue onto N9 – duration: 17 min (27,2 km)
- Drive to New Rd in Nieu-Bethesda – duration: 23 min (24,3 km)

Study the given directions and map given alongside, and answer the question that follow:

3.1.1 On the map, indicate, by either highlighting or circling, the part of the journey which is indicated by bullet point two. (2)

3.1.2 Calculate the average speed at which one must travel to arrive in Nieu-Bethesda in 44 minutes.

(4)

3.2 Study the map below to answer the questions that follow:

3.2.1 Nieu-Bethesda lies $\frac{1}{3}$ of the way between Graaff-Reinet and Hanover when travelling from Graaff-Reinet. Indicate with an **X** on the line between Graaff-Reinet and Hanover, where Nieu-Bethesda lies. (2)

3.2.2 Using the bar scale, determine the distance in km between Graaff-Reinet and Hanover.

_____

_____

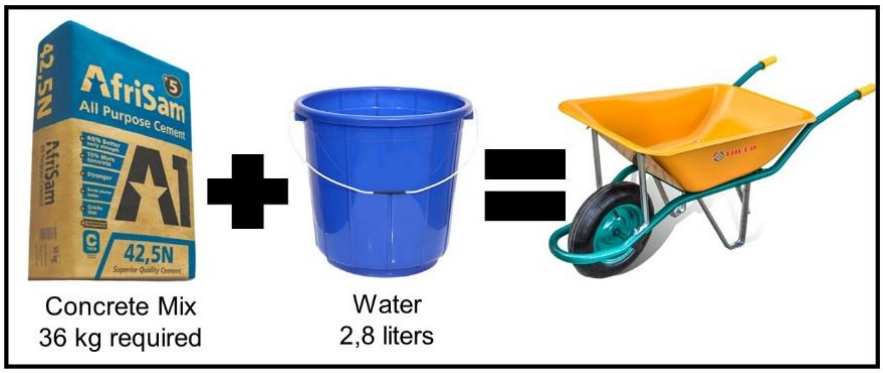
_____

_____

_____

(4)

3.3 A very popular tourist attraction in Nieu-Bethesda is the Owl House. The late Helen Martins, a famous South African artist, decorated her house and yard with peculiar cement and glass sculptures.



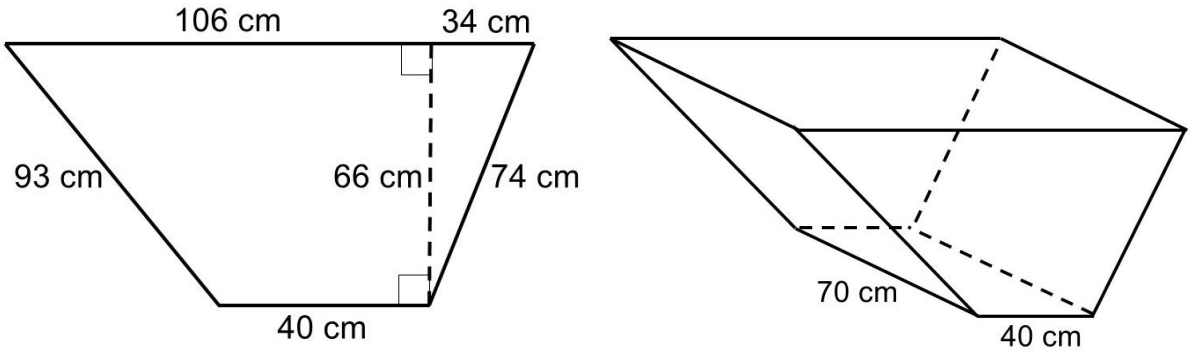
3.3.1 If one litre of water weighs 1 000 grams, determine the ratio of concrete mix to water, in simplest form.

(4)

3.3.2 Typical capacity of a wheelbarrow is approximately 100 litres (0,09995847 m^3) of material. By rounding 0,09995847 m^3 to one significant figure, convert the capacity to cm^3.

(3)

3.3.3 The side view and 3D diagram of a wheelbarrow tray, used to carry wet concrete, is given below.



You may use any or all of the following formulae to answer the questions that follow:

Volume of Rectangular Prism = length × breadth × height

Volume of a Triangular Prism = ($\frac{1}{2}$ × base × ⊥height) × height

Area of a Trapezium = $\frac{1}{2}$(sum of parallel sides) × (height)

Area of a Rectangle = length × breadth

Area of a Triangle = $\frac{1}{2}$ × base × ⊥height

(a) What volume of concrete would it take to fill this wheelbarrow?

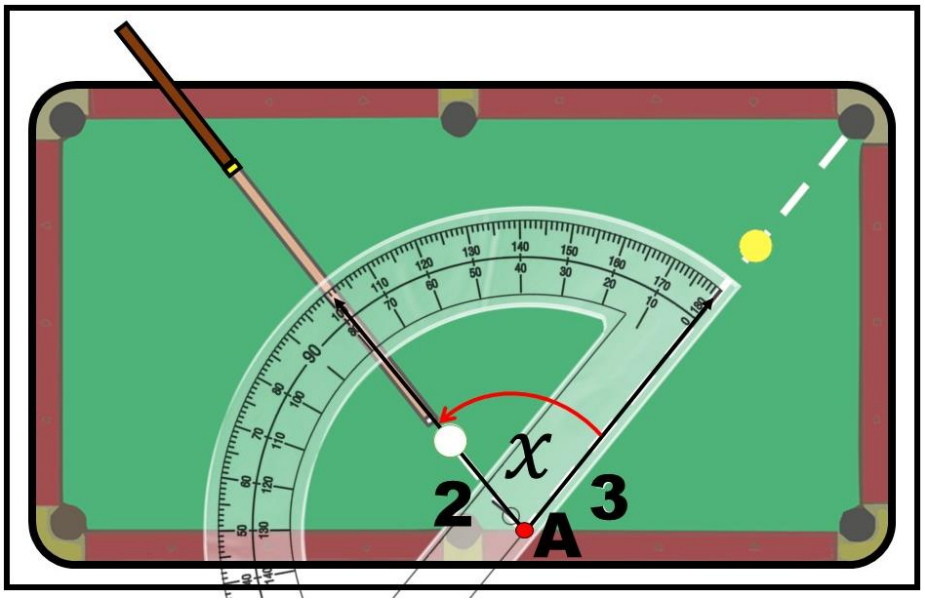
(5)

(b) The inside of the wheelbarrow tray must be painted with a sealant. Calculate the total surface area on the inside of the wheelbarrow tray that needs to be painted.

(6)
[30]

QUESTION 4

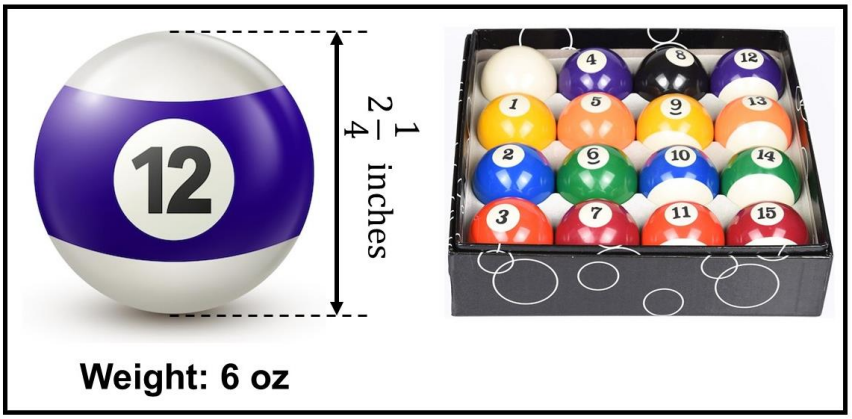
Pool is a sport played on a table with six pockets along the rails, into which balls are deposited, using cue sticks, as illustrated below:



4.1 Use the protractor illustrated above to measure the angle at which the shot must be taken to sink the ball at point A.

(2)

4.2 The balls numbered 1 through 7 have solid colours (solids) and the balls numbered 9 through 15 are white with a centre band of colour (stripes). The white ball is used to sink the other balls and the black ball (number 8) must be sunk last to win.



4.2.1 Calculate the radius of a ball in cm if one inch = 2,54 cm.

(3)

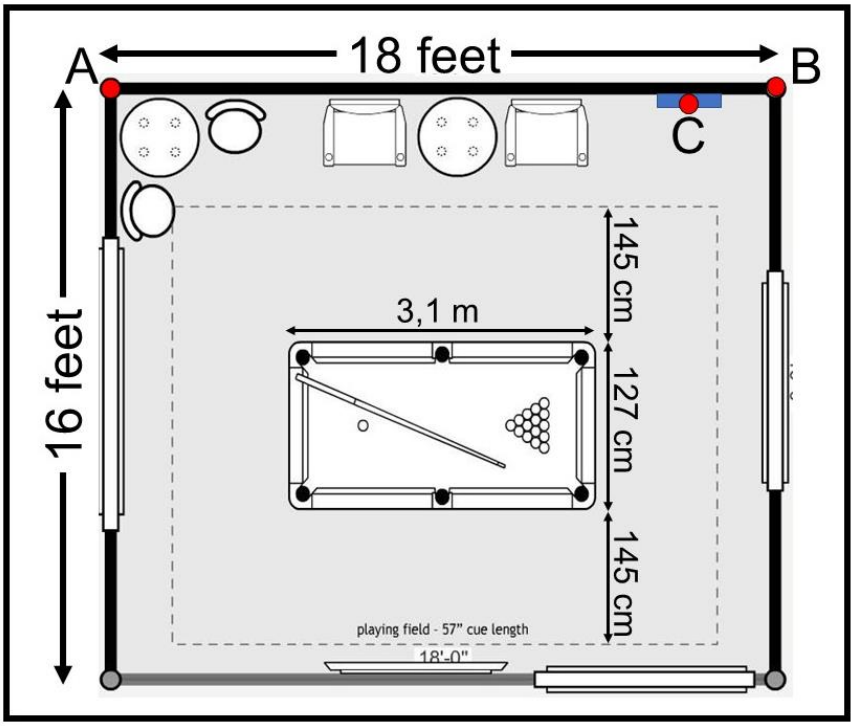
4.2.2 Estimate the length and height of the box in cm illustrated alongside the ball in the diagram on page 16. Assume that the balls are touching each other and the side of the box.

(4)

4.2.3 There are 15 balls on the table. If you exclude the black ball (numbered 8), each player has an equal chance of playing with solid balls or striped balls. What is the probability that a player will play with the solid balls?

(2)

4.3 John plays pool and darts in his game room. The floor plan of the room is illustrated below:



4.3.1 If one m^2 = 10,7639 ft^2, calculate the area of the room in m^2.

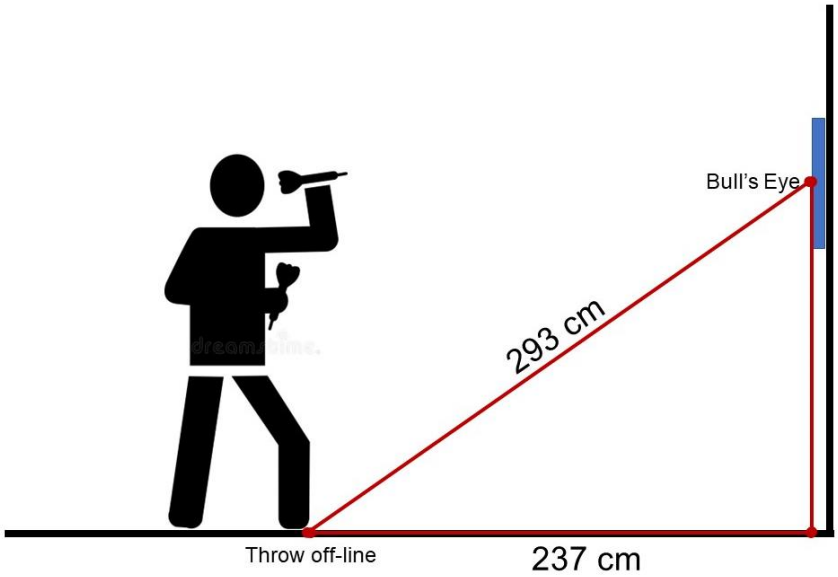
(4)

4.3.2 The dimensions of the pool table are illustrated on the floor plan on the previous page. A length of 145 cm is needed all around the pool table to form the playing area.

Show that the playing area takes up more than 90% of the total area of the room.

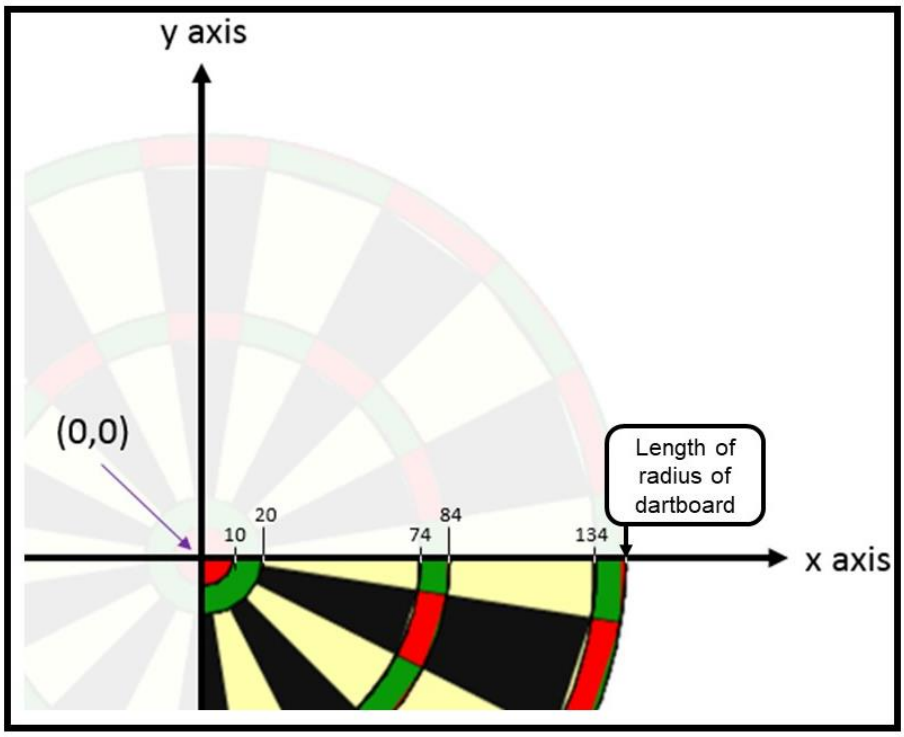
(7)

4.4 Calculate how high the bull's eye on the dartboard must be off the ground by using the following formula: $height = \sqrt{hypotenuse^2 - side^2}$



(2)

4.5 Using the diagram below, determine the length of the radius (mm) of the dartboard and hence calculate the area of the dartboard.

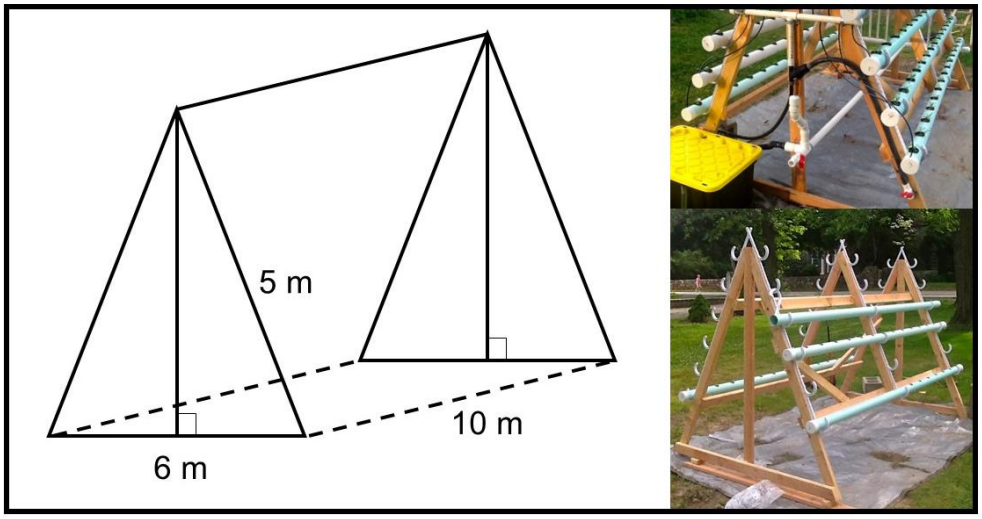


You may use the following formula: Area = 3,142 × radius^2.

(5)
[29]

QUESTION 5

An A-frame hydroponic garden system is a great project to create a vertical garden that maximizes the number of plants that can be grown in a small space without the need for soil.



Study the example of a homemade hydroponic garden above and answer the questions that follow:

5.1 PVC pipes are used to plant the plants in on the slanted sides of the A-frame garden system. Six pipes are attached on each slanted side of the A-frame. Determine the length of piping needed.

(3)

5.2 168 plants can be planted on the A-frame garden system. Estimate how far apart each plant must be planted in the PVC pipes if the first plant per pipe is planted 10 cm from the edge.

(6)

5.3 Hydroponic farming can save up to 99% of water used in traditional farming.

If 1 969 million m^3 of water is used annually in South Africa in traditional farming and 1 m^3 = 1 000 litres of water, determine how much water, in litres, hydroponic farming requires annually.

(5)

5.4 Hydroponic farming can grow about 240 times more than traditional farming methods. Annually 31 000 tonnes of lettuce are produced in South Africa.

5.4.1 How many tonnes of lettuce could be produced by hydroponic farming?

(2)

5.4.2 Convert your answer above to kilograms and give your answer in words.

(3)

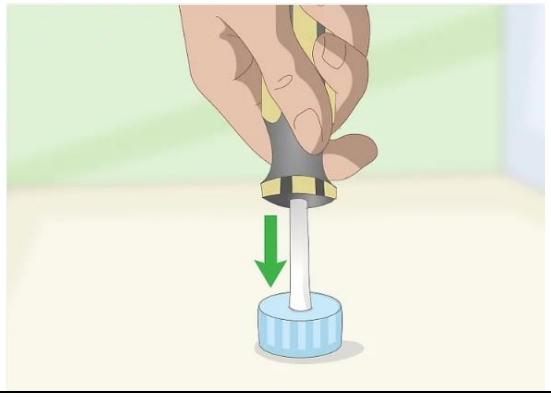
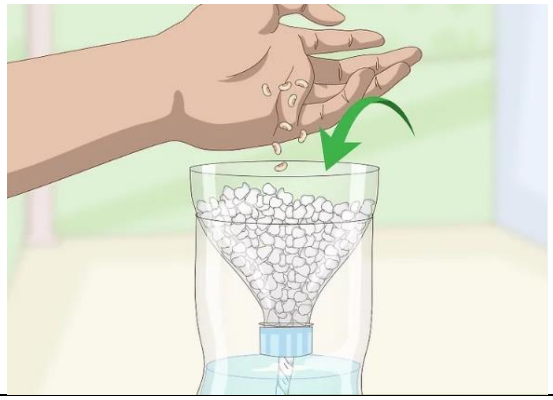
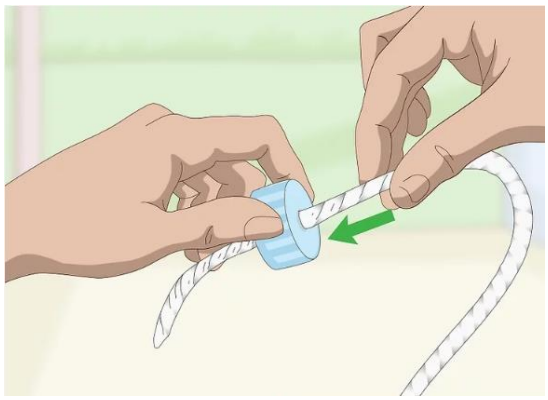
5.5 Hydroponic gardening means growing plants in a water-based system. To start a homemade hydroponic garden in your kitchen, you can make a simple ebb and flow system or a wick system. The instructions are given.

Link the correct diagram number to the instruction given in column one.

1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

(6)

1. Cut the top 10 cm off of a 2 litre recycled plastic bottle. Start your cut with a pair of scissors just above the bottle's label, or about 4 inches (10 cm) down from the top. Cut around the entire bottle until the top is completely removed. Using a 2 litre plastic bottle will hold 1 plant.	**A** 
2. Poke a hole through the bottle cap using a screwdriver by setting the bottle cap on a hard surface such as a cutting board. Hold the cap by its sides with your non-dominant hand while you punch a hole in the centre with a screwdriver. Make the hole about $\frac{1}{4}$ inch (0,64 cm) wide.	**B** 
3. Feed a piece of twine (a strong braided string) through the hole in the cap. Cut a piece of twine with a pair of scissors so it's about 30 cm long. Feed the end of the twine through the top of the bottle cap until you have about 15 cm on each side. Once the twine is through the cap, screw it back onto the bottle.	**C** 
4. Fill the bottom of the bottle with a nutrient solution. Visit your local gardening store to find a nutrient mix meant for hydroponic gardening. You can use the same solution regardless of what you plant in your system. Fill the bottom of your bottle with about 950 ml of tap water. Follow the directions on your nutrient solution to find the amount you need to stir into your water. Once you add the right amount, mix the water with a stir stick.	**D** 

5. Place the top of the bottle upside-down so the twine is mostly submerged. Once you have the nutrient solution mixed, set the top of the bottle upside-down so the cap faces down. Make sure there's about 2,5 cm of twine between the bottle cap and the top of the solution.	**E** 
6. Put growing medium and your seeds into the top of the bottle. Look for a medium that allows water and nutrients to easily travel through it, such as perlite or coconut coir. Spread 2 handfuls of the medium in the top portion of the bottle and tamp it lightly with your fingers. After the growing medium is added, you can plant your seeds at the depth specified on their packaging.	**F** 

5.6 A hydroponic garden system has 5 thyme plants, 4 rosemary plants and 4 origanum plants. All three herbs are delicious when used in cooking.

A tree diagram, given on page 26, illustrates the probability of a fresh herb being selected at random.

Study the tree diagram and answer the questions that follow here:

5.6.1 What is the probability that thyme would be selected first (A)?

_____

_____

(2)

5.6.2 The probability of selecting thyme at point B on the tree diagram is $\frac{4}{12}$, hence give the probability of selecting thyme at point C.

_____

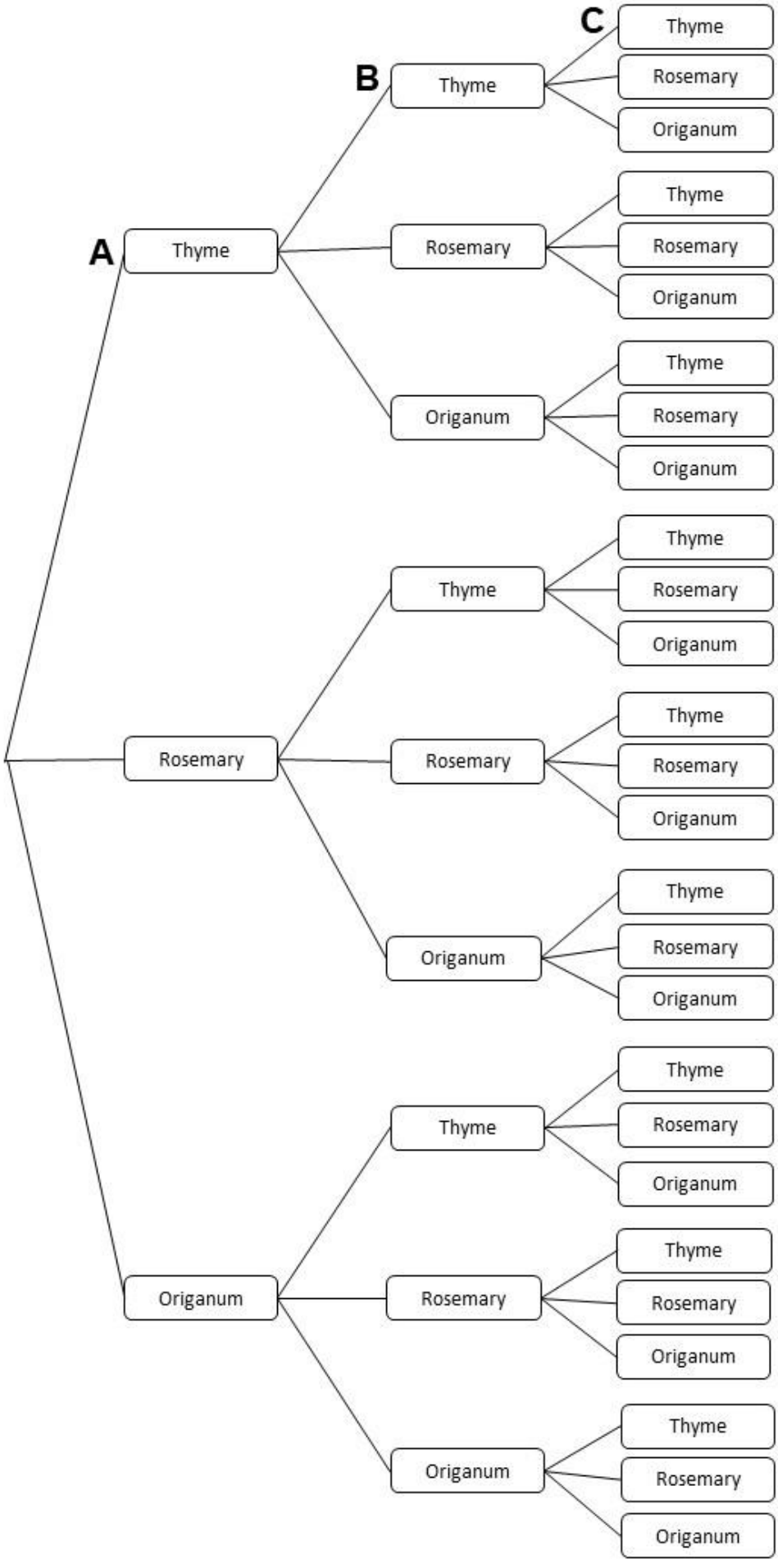
_____

(2)

5.6.3 What is the probability that thyme will be chosen three times in a row?

Note: $P_{TTT} = P_A \times P_B \times P_C$

(2)
[31]



ADDITIONAL SPACE (ALL QUESTIONS)

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