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POSSIBLE	33	37	20	27	33	150
ACTUAL						
QUESTION	1	2	3	4	5	TOTAL

➤ Source: Adapted from IEB Supplementary Mathematical Literacy Paper 2 May 2023

1. This question paper consists of 20 pages.
2. Read the questions carefully.
3. Answer ALL the questions on the question paper.
4. Diagrams are not necessarily drawn to scale.
5. You may use an approved non-programmable and non-graphical calculator unless otherwise stated.
6. Answers should be rounded off to two decimal places unless otherwise stated, or if the context requires rounding up or down.
7. Clearly show ALL calculations. Answers only will NOT necessarily be awarded full marks.
8. It is in your own interest to write legibly and to present your work neatly.

INSTRUCTIONS:

NAME & CLASS:

Mumo

EXAMINER:	C Sam	MARKS:	150
MODERATOR:	L Mudzamiri	TIME:	3 hours

GRADE 12

MATHEMATICAL LITERACY: PAPER 2

PRELIMINARY EXAMINATION: 4 SEPTEMBER 2023

HERITAGE HOUSE

CURRO

$2 \times 1000000 = 2000000 \text{ mg}$

3. Convert 2kg of lamb into milligrams. (2)

$6 \times 14,7868 = 88,72 \text{ mL}$

2. If 1 tablespoon = 14,7868 ml, determine how many millilitres of sunflower oil is needed. (2)

28

1. Determine how many different ingredients are needed for this recipe. (2)

Use the above information to answer the questions that follow.

Ingredients for 8 servings	
	• Chopped Lamb (2kg) • Raw Spices ➤ 2 cinnamon sticks ➤ 2 bay leaves ➤ 1 star aniseed ➤ 3 cloves ➤ 3 cardamon pods ➤ $\frac{1}{2}$ teaspoon fennel seeds ➤ 2 diced tomatoes • 2 cups of basmati rice • 1 cup lentils • 4 chopped medium size potatoes • $3\frac{1}{4}$ tablespoons rough salt • $\frac{1}{2}$ cup of water • 2ml yellow food colouring • 6 tablespoons of sunflower oil • 6 onions ➤ 20g thyme ➤ 50g crushed dhania ➤ 6 crushed chillies ➤ 50 g crushed mint ➤ 2 tablespoons chilli powder ➤ 2 tablespoons olive oil ➤ 1 teaspoon dhania powder ➤ 1 teaspoon jeera ➤ 1 tablespoon garam masala ➤ 1 teaspoon ginger and garlic ➤ 1 teaspoon turmeric • Marinade ➤ 1 stalk of curry leaf

ingredients to make lamb biryani are listed below.

a) Biryani is a classical Durban dish popularised by the Indian community in South Africa. The

4. One cup is equivalent to 250 ml. Measure out the rice and pouring 19 g. into a line, how much basmati rice is required.

(2)

171



5. The step-by-step preparation and cooking instructions for the biryani are given in column 2 below. Match the written instructions in column 2 with the relevant image given in column 2 one. Write the suitable letter of the image in column three.

(9)

Step-by-step instructions	Written instructions in order	Insert the letter of the image matching the given instruction
A.  Fried Onion Cooked Rice Lentils	Marination Add the marinade ingredients to the chopped lamb and leave in the fridge for 3 hours.	C
B. 	Boil rice with 1 tablespoon of salt for 15 minutes. Strain the rice and add the food colouring. Put this aside.	F

A	Once the potatoes are cooked, layer with the lentils, followed by half of the fried onions. Add the rice, followed by the rest of the onions.	 H.
I	Add the chopped potatoes to the pot and cook for a further 40 minutes adding half a cup of water.	 G.
H	Add 2 diced tomatoes and the marinated meat to the pot. Sprinkle 2 tablespoons of salt over the meat. Cook this for an hour.	 F.
G	Fry the 2 remaining onions together with the raw spices, and curry leaves for 3 minutes in the same oil.	 E.
B	Heat the 90ml of oil in a large pot at 177°C to fry 4 sliced onions until golden brown and put this aside on a paper towel.	 D.
D	Boil lentils with 4 tablespoons salt for 30 minutes and put aside.	 C.

b) The "Group Areas Act was the title of three acts of the Parliament of South Africa enacted under the apartheid government of South Africa. The acts assigned racial groups to different residential and business sections in urban areas in a system of urban apartheid." [Source: <https://www.sahistory.org.za/article/group-areas-act-1950>] Due to the Group Areas Act, a large Indian population still exists in towns like Chatsworth where ingredients for Indian cuisine can be found at the Bangladesh Market at affordable prices. Study the map on the next page to answer the questions that follow.

$150 = \frac{9}{5} (F - 32)$	$150 \div \frac{9}{5} + 32 = F$	$302 = F$

Use the formula: $^{\circ}\text{C} = \frac{9}{5} (^{\circ}\text{F} - 32)$

8. Convert the heat needed to the braise the biryani into degree Fahrenheit.

50g : 8 people	75g : 12 people

people.

7. Determine how many grams of crushed dhania are required to prepare the recipe for 12

$3\text{h} + 15\text{min} + 30\text{min} + 3\text{min} + 1\text{h} + 40\text{min} + 15\text{min} = 5\text{h} + 3\text{min}$

6. Using the above information, determine how long, in hours and minutes, does it take to

marinate and cook the biryani?

	and braise the contents of this pot for a further 15 minutes for the flavours to infuse throughout the layers.	E
--	---	----------

$$S = 52.8 \text{ km} \div \frac{59}{60} = 53.69 \text{ km/h}$$

4. Using the circled time and distance on the map, calculate the speed in km/h. (3)

$$2 \text{ cm} : 5 \text{ km}$$

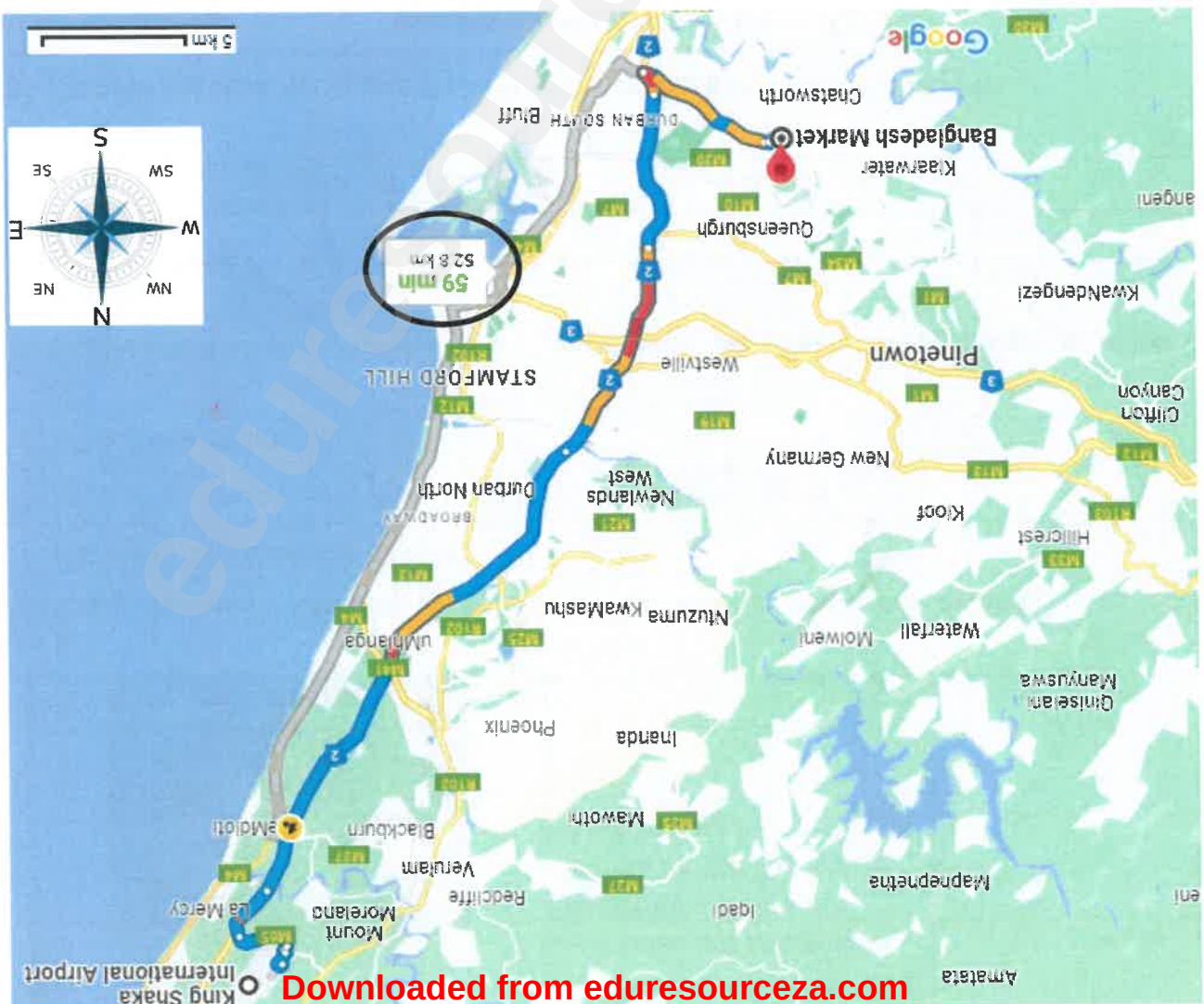
3. Determine the scale of the map. Write your answer as _____ cm : 5 km. (2)

Line scale

2. What type of scale is shown on the map. (2)

~~NE~~ SW

1. Give the general direction of the Bangladesha market from the King Shaka International Airport. (2)



mm 0x 45 50

$d = 474$
 $474 \times \frac{1}{4}$
 $t = 118,5 \text{ km}$
 $t = 355,5$
 120
 $t = 355,5$
 $t = 118,5$
 50
 $= 2 \text{ h } 22 \text{ min } 12 \text{ sec}$
 $\text{Total} = 5 \text{ h } 19 \text{ min } 57 \text{ sec}$

2. Calculate how long (in hours and minutes) the trip between Port Shepstone to Sodwana Bay will take if a $\frac{1}{4}$ of the distance is dirt road, while the rest is tarred. $\checkmark$ $t = \frac{d}{a}$ (PS) (SB)

1. Give the distance between Ladysmith and Newcastle.

(2)

109 km

②

[Source: https://www.kwazulu-natal-info.com/provinces/travel_info/distance-table]

City	Durban	PMB	RB	PS	Ladysmith	Newcastle	SB	Winterton
Durban	0	77	172	117	250	333	359	215
Pietermaritzburg (PMB)	77	0	240	189	170	260	423	137
Richards Bay (RB)	172	240	0	290	410	324	423	378
Port Shepstone (PS)	117	189	290	0	360	450	474	330
Ladysmith	250	170	410	360	0	109	387	48
Newcastle	333	260	324	450	109	0	357	157
Sodwana Bay (SB)	359	423	191	474	387	387	0	650
Winterton	215	137	378	330	48	157	650	0

speed limit for national roads that are tarred is 120 km/h and 50 km/h on dirt road.

a) The table below shows the distances in kilometres between various cities in KwaZulu-Natal. The

Yes, the bus has free 5G Wi-Fi!

3. State if a passenger can download road maps on their phone if they have used up their mobile data bundle. Explain your answer.
- (3)
2. Using an X, indicate seat number C8 on the layout plan above.
- (2)

44

1. Determine the maximum number of passengers that can be seated in this bus.
- (2)



layout to answer the questions that follow.

- b) The seating layout of the bus is shown below. Use the

1. The attached ruler illustrates two lengths: centimeters on one side and inches on the other. Using the ruler, give the length in inches.
- (2)



- c) A sandwich and a beverage are given to passengers on the luxury bus. Ceres juice is one of the beverage options as depicted in the diagram below.

$997,9024 \times 0,001 = 0,998 \text{ tonnes}$
$2200 \times 0,453592 = 997,9024 \text{ kg}$
$50 \text{ lb} \times 44 = 2200 \text{ lb}$

Kilogram	1	=	0,001	Tonne
Pound	1	=	0,453592	Kilogram

4. The weight of each row of luggage is shown below. Show that the maximum weight of luggage the bus can carry is 0,998 tonnes.
- (6)

Outcomes	Probability
Veg, Milkshake	51
Veg, Milkshake	1000
Veg, Juice	153
Veg, Juice	200
Veg, Cooldrink	9
Veg, Cooldrink	400
Fish, Milkshake	1
Fish, Milkshake	40
Fish, Juice	1
Fish, Juice	10
Fish, Cooldrink	F: $\frac{1}{8}$
Fish, Cooldrink	F: 78
Beef, Milkshake	625
Beef, Milkshake	36
Beef, Juice	625
Beef, Juice	86
Beef, Cooldrink	625
Beef, Cooldrink	301
Chicken, Milkshake	2500
Chicken, Milkshake	28
Chicken, Juice	625
Chicken, Juice	287
Chicken, Cooldrink	2500

3. The following sandwiches are available on the bus: Veg, Fish, Beef or Chicken. Similarly, the following drinks are available: Milkshake, Juice or Coldrink.

$V = 4.8 \times 3.8 \times 12$
 $= 218.88 \text{ cm}^3$
 $= 218.88 \text{ mL}$
 $1 \text{ fl oz} : 29.574 \text{ mL}$
 $7.4 \text{ fl oz} : 218.88 \text{ mL}$
 $8 \text{ fl oz} \approx$ (rounded up)

Note: $1\text{ cm}^3 = 1\text{ ml}$ and $1\text{ fl oz} = 29,574\text{ ml}$.

2. The length of the base of a rectangular prism is 8 fluid ounces (fl oz).
(5) $V = 2 \times 6 \times 7$

$$\approx 1 : 6667$$

M : R
4,5cm : 300m X 100
4,5cm : 30000 cm
1 : 6666,...

5. If the straight-line distance between the Seal Stadium and the Shark Dive is 300m, determine the unit scale of the map. Measure from the arrow apex of the landmark to the next. Round off your answer to the nearest unit.

(4)

Travel South, taking your second East turn, take your first turn South, heading Northeast. ① for highlight
 towards Ushaka Kids World. (Include landmarks while describing)

4. Give clear instructions using compass directions and landmarks from the ticketing station to the Ushaka Kids World. Highlight your path on the map.

(4)

Seal Stadium

3. Name the feature that can be seen in grid reference D3.

(2)

D6

2. Give the grid reference of the Rope Adventure.

(2)

8

1. State the number of toilets on the map.

(2)

Use the map on the next page to answer the following questions.

- a) Ushaka Marine World in Durban is a world-class entertainment and tourism destination. At the end of Durban's Golden Mile is the beginning of Ushaka Marine World - spanning over 15 hectares of prime beach front, Ushaka Marine World is Africa's largest Marine Theme Park.

[20]

QUESTION 3

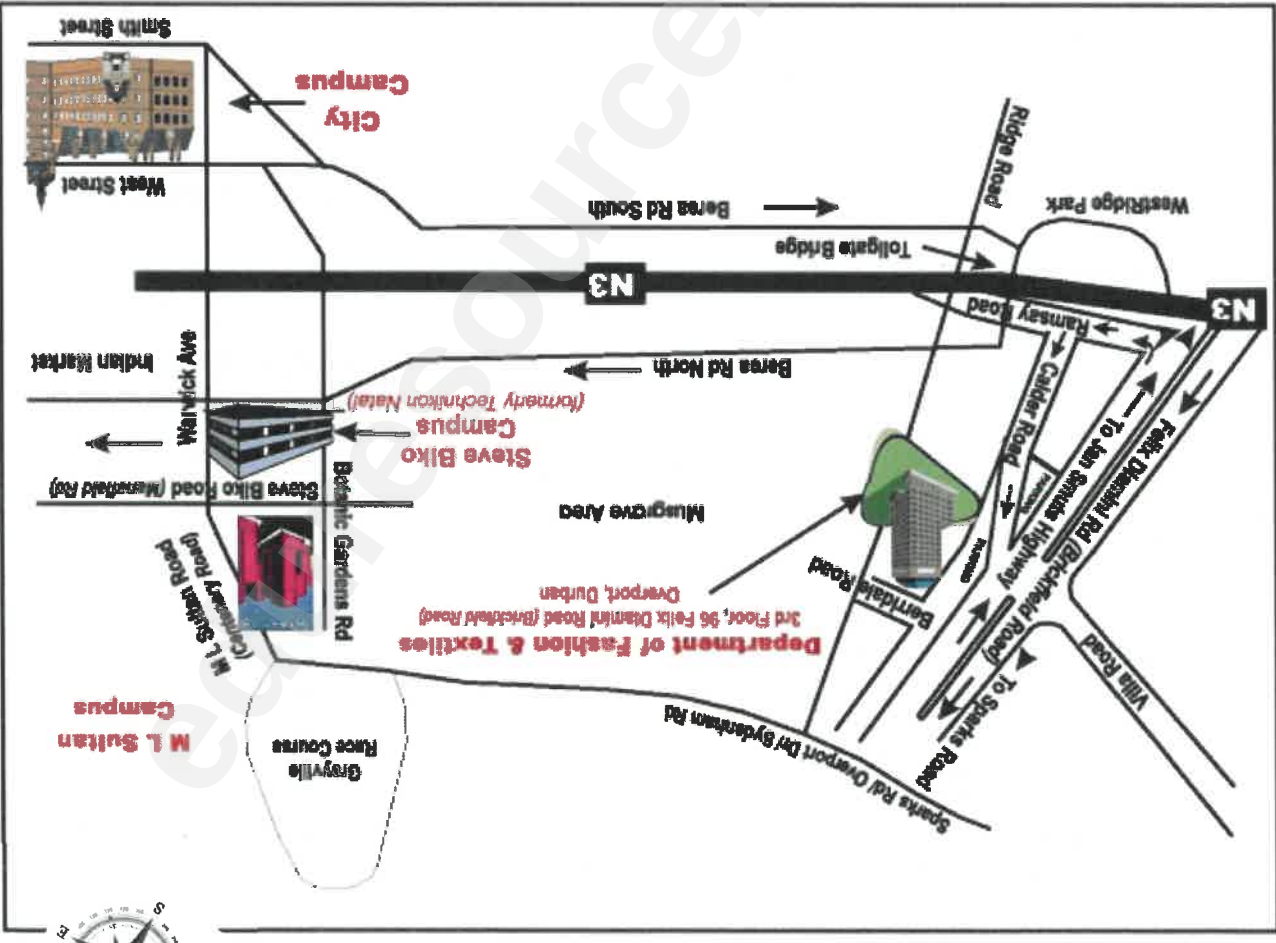
$$p = \frac{1}{40} + \frac{2500}{301} = \frac{727}{301} = \frac{5000}{301}$$

11. Calculate the probability of choosing a milkshake from a menu with a Milkshake.

(3)

[Source: <https://www.sa-venues.com/attractionskzn/ushaka-marine-world.php>]





[Source: https://www.dut.ac.za/wp-content/uploads/maps/Campus_Maps.pdf]

1. The formerly named Technikon Natal lies on the corner of which two streets?

(2)

Botanic Gardens Rd & Steve Biko Rd or Bera Rd North & Warwick Ave.

2. Which National Road runs parallel to the City Campus?

(2)

N3

3. If you exit the Department of Fashion and Textiles and you are facing Northwest on Calder Berridge

(2)

Road, what feature lies most Northeast?

Greyville Race Course

5 buses. Bus 1 can take the next schedule at 12:00 and so forth. Accept 10 (should have said the minimum # of buses)

answer. (3)

3. How many buses are needed to complete the Summer People Mover timetable? Justify your

The City Cathedral

the bus? (2)

2. You arrive at the Zoo at 1:00 pm after being on the bus for 52 minutes. Where did you get on

31 min + 10 min + 8 min = 49 min

11. the Arts Centre to the City Cathedral. (3)

1 h 3 min

1. Calculate the time it takes to get from:
1. the Museum to the Hall of Fame. (2)

[Source: Mind Action Series]

Depart	Explorer Depot	City Cathedral	Railway Station	Parliament	Museum	City Square	Zoo	Docklands	Shops	Arts Centre	Water Gardens	Hall of Fame	Arrive
10:00	10:25	10:50	11:15	11:45	12:00	12:25	12:50	13:15	13:40	14:05	14:30	14:55	15:20
10:08	10:33	10:58	11:23	11:53	12:08	12:33	12:58	13:23	13:48	14:13	14:38	15:03	15:28
10:15	10:40	11:05	11:30	12:00	12:15	12:40	13:05	13:30	13:55	14:20	14:45	15:10	15:35
10:25	10:50	11:15	11:45	12:15	12:40	13:05	13:30	13:55	14:20	14:45	15:10	15:35	16:00
10:33	10:58	11:23	11:53	12:23	12:48	13:13	13:38	14:03	14:28	14:53	15:18	15:43	16:08
10:40	11:05	11:30	12:00	12:30	12:55	13:20	13:45	14:10	14:35	15:00	15:25	15:50	16:15
10:49	11:14	11:39	12:09	12:39	13:09	13:39	14:09	14:39	15:09	15:39	16:09	16:39	17:09
10:58	11:23	11:48	12:18	12:48	13:13	13:38	14:03	14:28	14:53	15:18	15:43	16:08	16:33
11:05	11:30	11:55	12:25	12:55	13:20	13:45	14:10	14:35	15:00	15:25	15:50	16:15	16:40
11:15	11:40	12:05	12:35	13:05	13:30	13:55	14:20	14:45	15:10	15:35	16:00	16:25	16:50
11:23	11:48	12:13	12:43	13:13	13:38	14:03	14:28	14:53	15:18	15:43	16:08	16:33	16:58
11:30	11:55	12:20	12:50	13:20	13:45	14:10	14:35	15:00	15:25	15:50	16:15	16:40	17:05
11:37	12:02	12:27	12:57	13:27	13:52	14:17	14:42	15:07	15:32	15:57	16:22	16:47	17:12
11:44	12:09	12:34	13:04	13:34	14:04	14:29	14:54	15:19	15:44	16:09	16:34	16:59	17:24
11:50	12:15	12:40	13:10	13:40	14:10	14:35	15:00	15:25	15:50	16:15	16:40	17:05	17:30
11:58	12:23	12:48	13:18	13:48	14:18	14:43	15:08	15:33	15:58	16:23	16:48	17:13	17:38
12:05	12:30	12:55	13:25	13:55	14:25	14:50	15:15	15:40	16:05	16:30	16:55	17:20	17:45
12:15	12:40	13:05	13:35	14:05	14:30	14:55	15:20	15:45	16:10	16:35	17:00	17:25	17:50
12:25	12:50	13:15	13:45	14:15	14:40	15:05	15:30	15:55	16:20	16:45	17:10	17:35	18:00
12:35	13:00	13:25	13:55	14:25	14:50	15:15	15:40	16:05	16:30	16:55	17:20	17:45	18:10
12:40	13:05	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00
12:45	13:10	13:35	14:05	14:35	15:05	15:35	16:05	16:35	17:05	17:35	18:05	18:35	19:05
12:50	13:15	13:40	14:10	14:40	15:10	15:40	16:10	16:40	17:10	17:40	18:10	18:40	19:10
12:55	13:20	13:45	14:15	14:45	15:15	15:45	16:15	16:45	17:15	17:45	18:15	18:45	19:15
13:00	13:25	13:50	14:20	14:50	15:20	15:50	16:20	16:50	17:20	17:50	18:20	18:50	19:20
13:05	13:30	13:55	14:25	14:55	15:25	15:55	16:25	16:55	17:25	17:55	18:25	18:55	19:25
13:10	13:35	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30
13:15	13:40	14:05	14:35	15:05	15:35	16:05	16:35	17:05	17:35	18:05	18:35	19:05	19:35
13:20	13:45	14:10	14:40	15:10	15:40	16:10	16:40	17:10	17:40	18:10	18:40	19:10	19:40
13:25	13:50	14:15	14:45	15:15	15:45	16:15	16:45	17:15	17:45	18:15	18:45	19:15	19:45
13:30	13:55	14:20	14:50	15:20	15:50	16:20	16:50	17:20	17:50	18:20	18:50	19:20	19:50
13:35	14:00	14:25	14:55	15:25	15:55	16:25	16:55	17:25	17:55	18:25	18:55	19:25	19:55

People Mover Bus in Durban.

a) Durban has a hop-on-hop-off sightseeing buses for tourists. This is the summer timetable for the

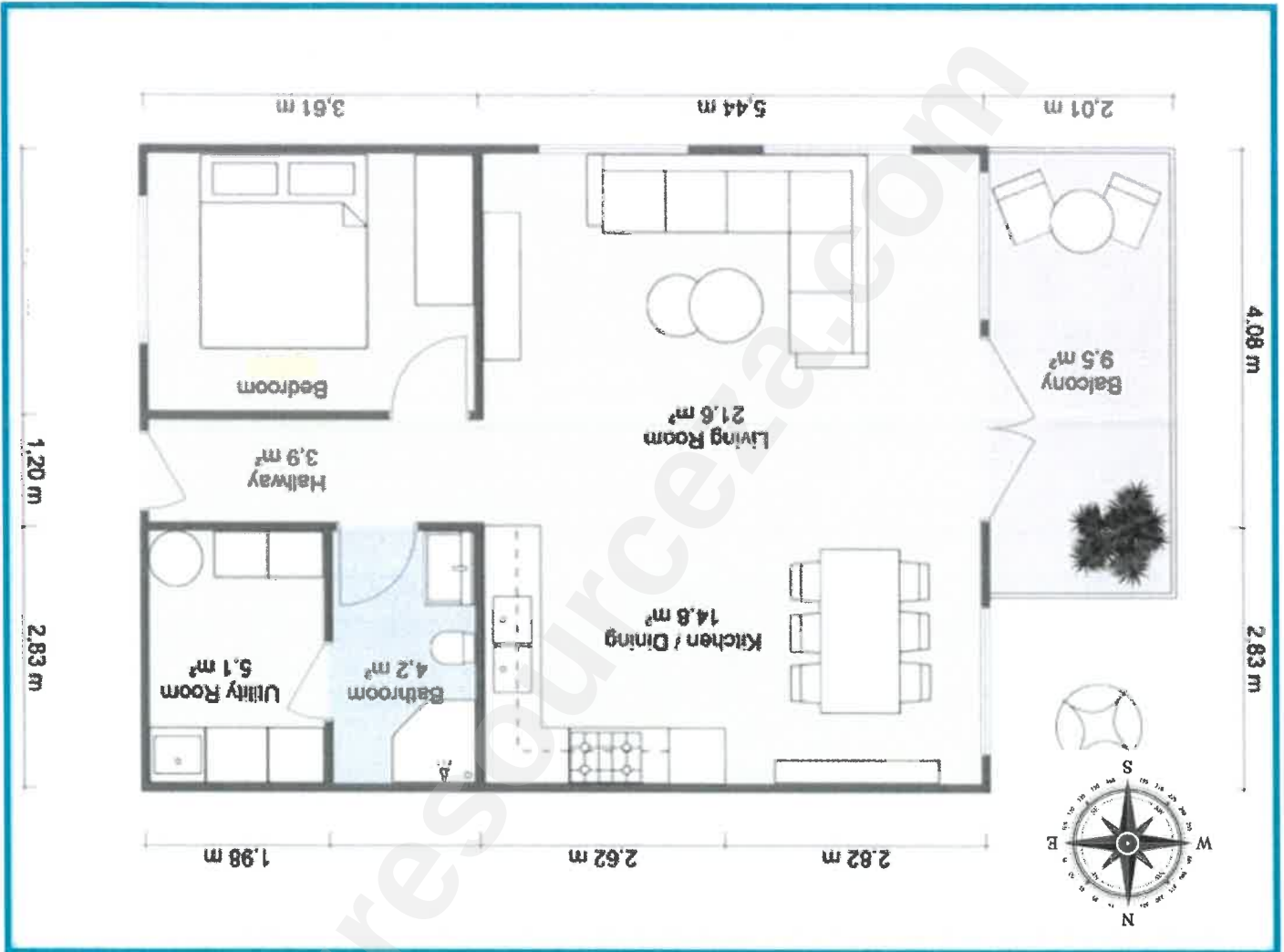
Single + 1 Bedroom

Justify your answer.

(2)

1. State if you think the floor plan above is of a single or a family apartment.

[Source: <https://www.roomsketcher.com/blog/floor-plan-dimensions/>]



the apartment is displayed below.

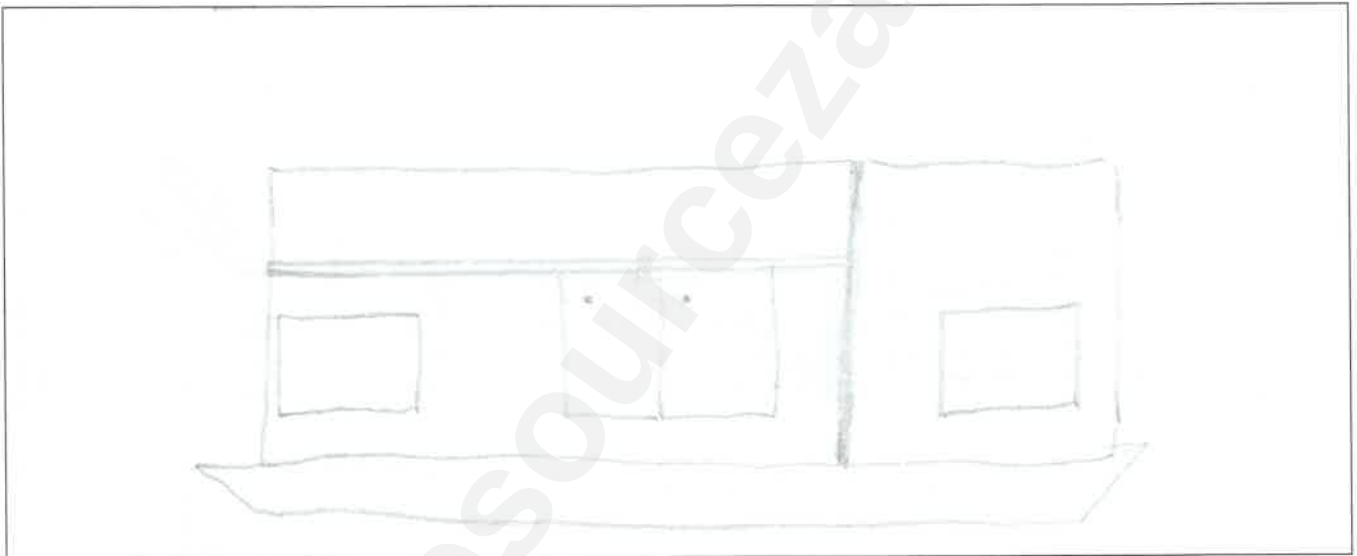
b) After your city trip, you decide to stay at the apartment you rented on Airbnb. The floor plan of

10:33 → 11:00 + 1h = 12:00 → 12:20 → 12:45 + 45 min	Yes
3:23 ← 3:04 ← 2:39 ← + 30 min	
2:09 → 1:50	
1:30	

(5)

determine if you will arrive at the Hall of Fame on time.

Arts Centre. Your parents are fetching you from the Hall of Fame at 3:30. Using calculations, Museum. You spend 1 hour at the Museum, 45 minutes at the Zoo, and 30 minutes at the



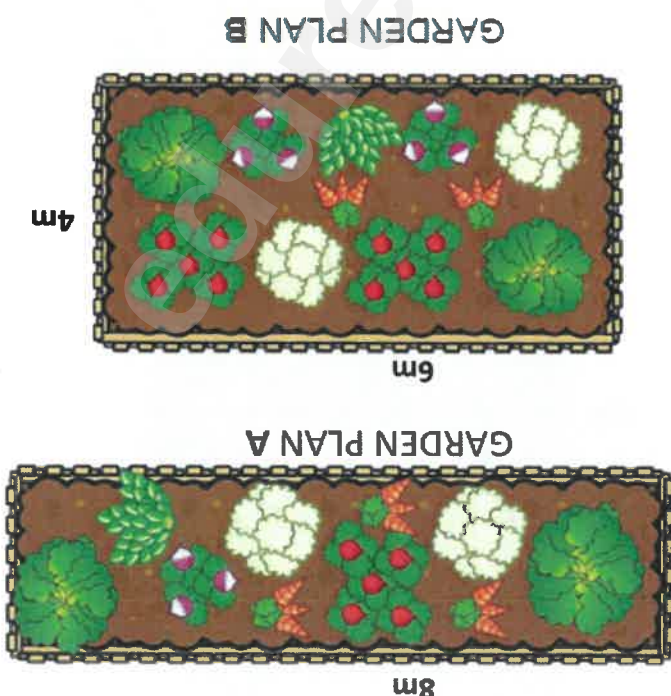
4. Draw a rough sketch of the West Elevation of the apartment including all the necessary details.

3. Use your answer in Question (b2), to calculate the breadth of the bedroom.

2. Using the width of the bedroom, calculate the area of the bedroom in its simplest form.

"Luyanda Shange, a Pietermaritzburg born young man, has established the NPO – Monica's Greens. He is dedicated to enabling and empowering underprivileged youth by engaging them in community gardening to learn the intricacies of growing fresh produce. By selling fresh produce to locals and vendors, the foundation benefits the community with nutritious food and provides a source of income to those involved."

Luyanda must decide between two different rectangular shaped garden sizes as depicted in Garden Plan A and Garden Plan B.



- a) Luyanda only has 21m of fencing to enclose the vegetable garden. Determine, with calculations, which one of the garden plans above will give Luyanda the maximum ground cover while using the minimum amount of fencing.

(5)

$$\text{Perimeter of rectangle} = 2 (\text{Length} + \text{Width})$$

$$\text{Area of rectangle} = \text{Length} \times \text{Width}$$

A	$P = (8+3)2 = 22\text{ m}$	$A = 8 \times 3 = 24\text{ m}^2$	$P = (6+4)2 = 20\text{ m}$	$A = 6 \times 4 = 24\text{ m}^2$
B				

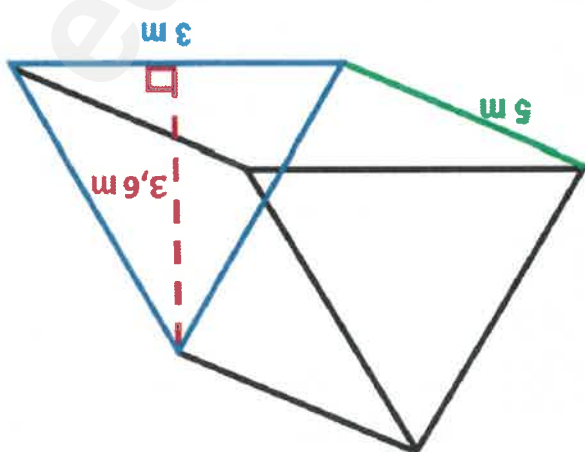
- b) Luyanda decides to build an A-frame 'greenhouse' to guard his vegetable garden from extreme weather. The greenhouse is made up of two rectangular side faces, with a rectangular base, and two triangular faces with two sides equal in each triangle.

$$\begin{aligned} A_{\text{rect}} &= \frac{1}{2} \times 3 \times 3,6 \times 2 = 10,8 \text{ m}^2 \\ A_{\text{tri}} &= \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 3 \times 3,9 = 5,85 \text{ m}^2 \\ \text{Total} &= 10,8 + 5,85 = 16,65 \text{ m}^2 \end{aligned}$$

3. Determine the minimum amount of plastic required to cover the greenhouse as illustrated in Diagram A (no plastic is needed on the base of the greenhouse, and you may ignore any overlap).

2. If it takes 2 people 1 hour and 35 minutes to build one of these greenhouses, how long will it take 3 people, in hours and minutes to build the same greenhouse?

1. Calculate the total length of wood needed to build ONE of the triangular faces of this greenhouse. Give your answer to the nearest metre.



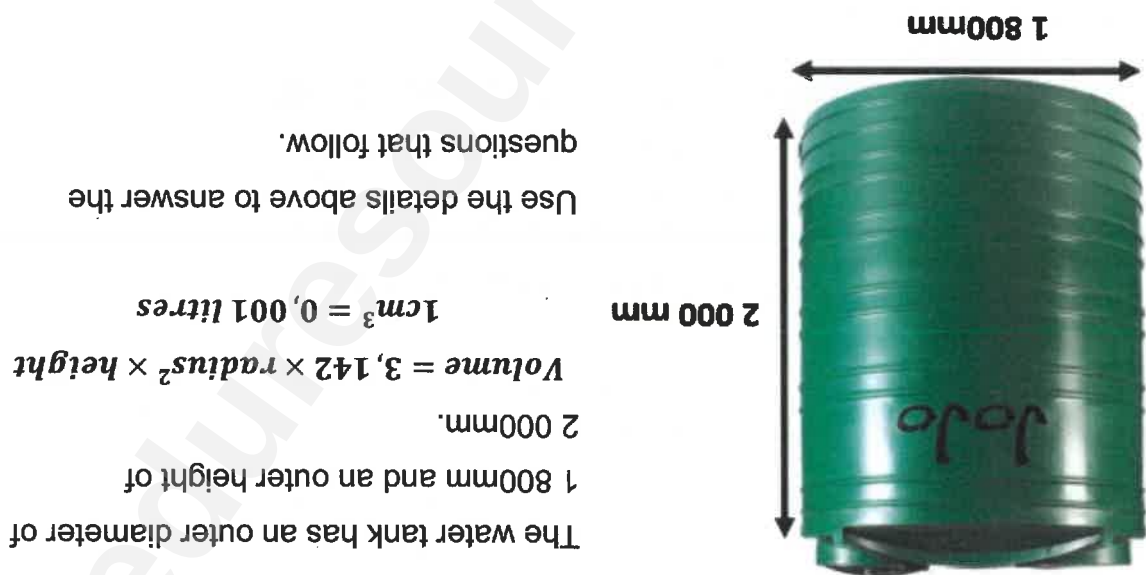
Picture of a triangular prism greenhouse

Thickness of Jojo tank. Outer thickness inside
$V = 3,142 \times 90^2 \times 200$
$= 5090040 \text{ cm}^3 \times 0,001 = 5090,04 \text{ L}$
Thickness of Jojo tank. Outer thickness inside

2. Luyanda realised that the maximum capacity of the water tank is 5 000 litres. He stated that the actual volume of the water tank using the dimensions above, gives a higher capacity of water. Using calculations, validate Luyanda's statement. Additionally, give a possible reason for the difference in capacity.

90 cm

1. Write down in cm, the out radius of the Jojo tank.



- c) Luyanda will have a large cylindrical Jojo water tank to store water for the vegetable garden.

$V = 6 \times 4 \times 0,06$
$= 1,44 \text{ m}^3$
Volume = Length x Width x Height

4. Luyanda will need to spread compost with a 10 cm layer over the base of the enclosed garden. Calculate the volume, in m^3 , of the compost required.

TOTAL: 150

$21 \text{ in} \times 2.54 = 53.84 \text{ cm} \div 100 = 0.5384 \text{ m}$	
$l \rightarrow 8 \div 0.5384 = 14.9 \dots \approx 15$ or 14	
$b \rightarrow 3 \div 0.5384 = 5.62 \approx 5$	
# of Cauliflower = $15 \times 5 = 75$	
$14 \times 5 = 70$	



- II. Determine the maximum number of cauliflower seedlings that can be planted in Garden Plan A shown below. Use: 1 in = 2.54cm

1. Convert into $^{\circ}\text{C}$ the lowest soil temperature which allows the cauliflower plant to germinate given that $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \div 1.8$.

- [Source: <https://www.almanac.com/plant/cauliflower>]
- Cauliflower plants need to be set 21 inches apart when planted.
 - Cauliflower seeds are capable of germinating in soil temperatures as low as 60°F .

these facts and answer the questions that follow:

3. Luyanda researched how to grow cauliflower and found the following interesting facts online. Study