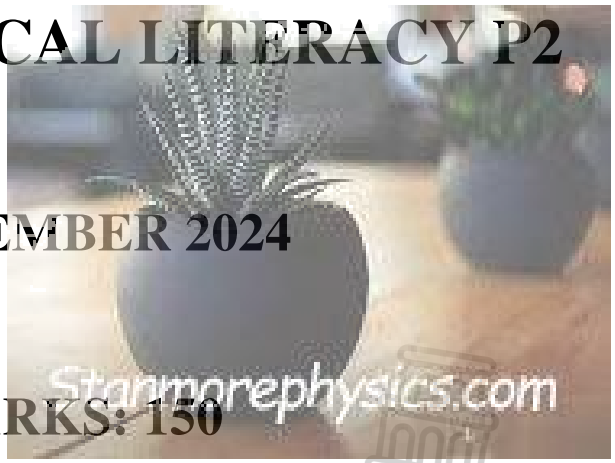
education

Department of Education
FREE STATE PROVINCE

PREPARATORY EXAMINATION

GRADE 12

MATHEMATICAL LITERACY P2



SEPTEMBER 2024

MARKS: 150

TIME: 3 HOURS

This question paper consists of 14 pages and an addendum with 5 annexures.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.

2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   - ANNEXURE A for QUESTION 1.1
   - ANNEXURE B for QUESTION 1.2
   - ANNEXURE C for QUESTION 2.1
   - ANNEXURE D for QUESTION 4.1
   - ANNEXURE E for QUESTION 5.1

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. Show ALL calculations clearly.

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

8. Indicate units of measurement, where applicable.

9. Diagrams are NOT necessarily drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

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QUESTION 1

1.1 Soccer city stadium, also known as FNB stadium is one of the stadiums in South Africa used to host big soccer games.

ANNEXURE A shows the seating layout of the soccer city stadium in Johannesburg.

Use ANNEXURE A to answer the questions that follow.

1.1.1 State the view represented by the seating layout of the stadium. (2)

1.1.2 The capacity of the stadium is 88 000 spectators. Define the concept capacity using the context given. (2)

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1.1.3 Siba wanted to enter the stadium using entrance number 12. Write down the name of the road that passes next to that entrance. (2)

1.1.4 Write down the number of ticket clearing points and entrances into the stadium. (2)

1.1.5 For a certain match taking place in the stadium, 85% of the tickets were sold. Calculate the number of seats which were not occupied in the stadium during the match. (2)

1.2 The Central University of Technology wanted to replace the old student desks in their student accommodation with new ones.

ANNEXURE B shows the item list that comes in a package of a student desk.

Use ANNEXURE B to answer the questions that follow.

1.2.1 Determine the total number of washers needed to assemble the student desk. (2)

1.2.2 Give one use of a student desk. (2)

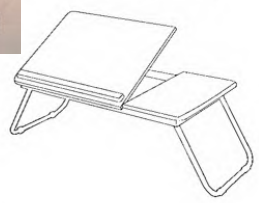
1.2.3 Write down the item, using the symbol, from step 2 which is not listed under the item list. (2)

1.2.4 Write down the number of screws used to attach the top unit in step 3. (2)

1.2.5 One apartment has four rooms inside. Calculate the number of new desks needed, for fifteen apartments if one desk is placed in every room. (2)

1.3 One of the students bought a foldable laptop stand to use for his laptop.

Shown below are the pictures of the package box and the dimensions of the stand.

PACKAGE BOX	DIMENSIONS OF THE FOLDABLE STAND
KOGA FOLDABLE LAPTOP STAND (GREY) W30 x H27 x L79 CM • Multi-purpose laptop stand • Also used as a breakfast stand • Easily adjustable and space efficient • Easy to clean • No assembly required 	

Use the information above to answer the questions that follow.

1.3.1 Calculate, in cm, the total length of the upper part of the stand. (2)

1.3.2 Write down the colour of the stand that the student bought. (2)

1.3.3 Explain the phrase 'No assembly required' (2)

1.3.4 Convert the height of the desk to mm. (2)

[28]

QUESTION 2

2.1 Mr Labuschagne, a paralympic athlete (athlete with disability) staying in South Africa, travelled to Tokyo to enter the 42 km paralympic marathon.

ANNEXURE C shows a route map of the marathon from the starting to the finishing point

Use the information above and ANNEXURE C to answer the questions that follow.

2.1.1 State the general direction of Tokyo Skytree from the starting point. (2)

2.1.2 Write down the probability of selecting a group with men and women participating in the marathon. Give your answer as a fraction. (2)

2.1.3 After completing his training in South Africa, Mr Labuschagne stated that he will be able to complete the marathon in 2 hours 33 minutes. State two factors that may affect his running pace during the marathon. (4)

2.1.4 Write down the name of the station which is situated at the 15 km mark of a marathon. (2)

2.1.5 Calculate how many kilometres will be left before reaching the finishing point when an athlete is at the 40 km mark of the marathon. (2)

2.1.6 Write down the number of U-turns shown on the map. (2)

2.1.7 The information about different groups participating in the marathon together with the starting times was provided on the internet.

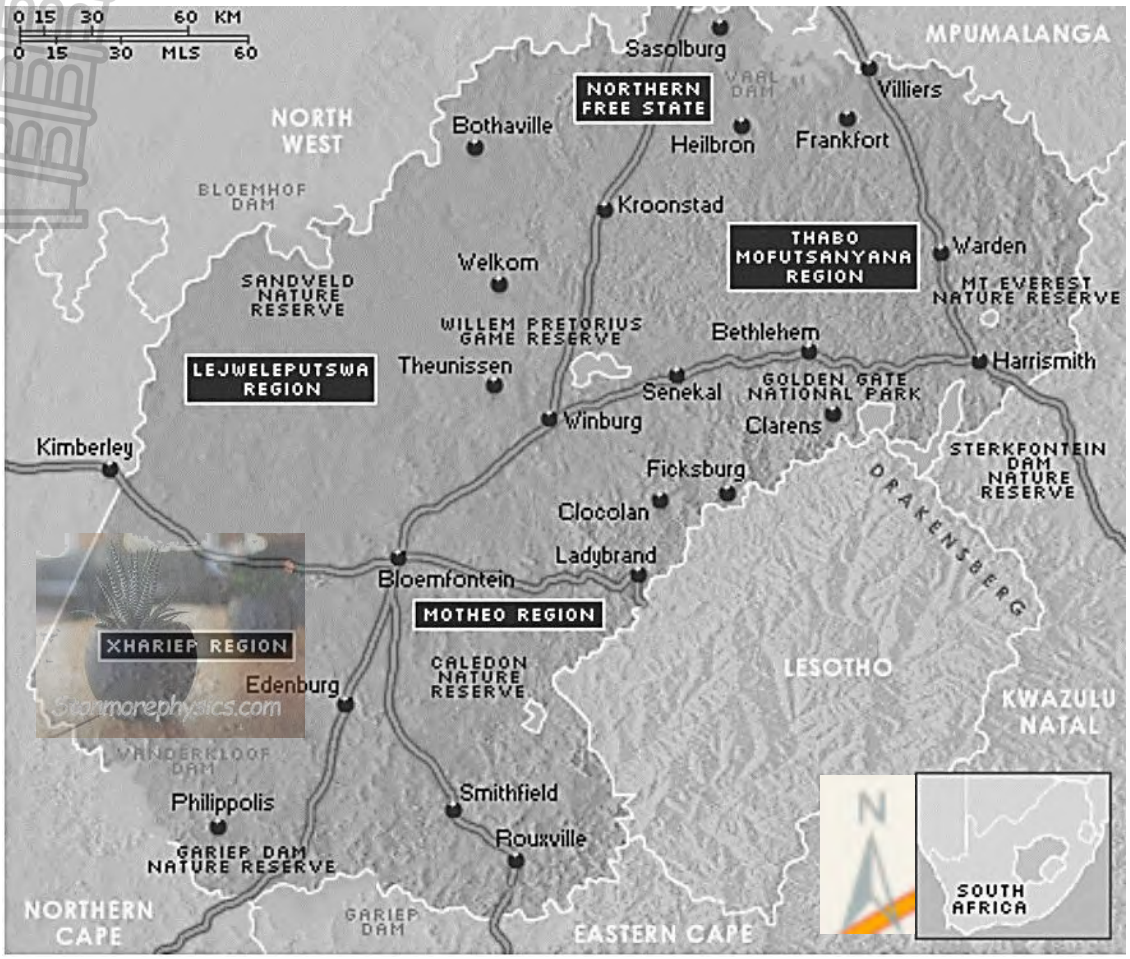
Group	Time
T12 – athletes with visual impairments	08:00 am
T46 – athletes with upper limp deficiency	07:00 am
T54 – athletes on wheelchairs	06:30 am

(a) Give ONE possible reason why different groups start at different times. (2)

(b) There were three thousand nine hundred and sixty athletes on the day of the marathon. Group T12 had 1 700 athletes and T54 had 1 580 athletes.

Write down, in a simplified form, the ratio of the three groups. (3)

2.2 Mr Labuschagne stays in Edenburg and he regularly travels to Bloemfontein to visit his parents. The map below shows the location of the two places.



[Source:sa-venues.com]

Use the information above to answer the questions that follow.

2.2.1 Write down the number of **nature reserves** appearing on the map (2)

2.2.2 Write down the name of the province that is situated in the north easterly direction from Edenburg. (2)

2.2.3 Mr Labuschagne wanted to check the distance from Edenburg to Bloemfontein. He used the distance calculator on the internet and found out that the distance between the two places is 77,5 km.

Calculate the distance between the two places using accurate measurement and the scale provided. Give one possible reason why the calculated distance and the one from the internet are not the same (7)

[30]

QUESTION 3

3.1 A farmer in the United States of America uses the containers below to store and supply milk to local factories.

330 Gallon IBC Tote	55 Gallon drum
 **Inside dimensions** Length = 48 inches Width = 40 inches Height = 46 inches	

[Source: IBCtanks.com]

NOTE:
1 gallon = 4,546092 litres
1 inch = 2,54 cm
1 m ℓ = 1 cm^3

Use the information above to answer the following questions.

3.1.1 Convert 55 gallons to litres. Round your answer to the nearest whole number. (3)

3.1.2 Write down TWO dairy products that can be produced by using milk. (2)

3.1.3 Show, by means of calculations, that the IBC tote can hold more than 310 gallons of milk.

You may use the formula:

Volume of a rectangular prism = length ×width ×height (6)

3.1.4 The farmer decided to paint the total external surface area of the drum to keep it away from rusting. The spread rate of the paint is 2,5$m^2/ℓ$ and the paint is sold in 1ℓ tins. Calculate how many tins of paint will be needed to paint one drum.

You may use the formula:

Surface area of a cylinder (in m^2)
= (2 ×3,142 ×r^2) + (2 × 3,142 × r × h)
Where **r** = radius and **h** = height (9)

3.2 The farmer checks the weight of the cows once per term to make sure that they are healthy so that they can produce enough milk. He uses a manual way of calculating the weight by measuring the cow's girth and the body length.

NB: Girth is the measurement around the middle of the cow.

Use the information above to answer the following questions.

3.2.1 Choose the most accurate tool from the ones listed in the bracket.

The farmer may use the (measuring tape/ruler) to measure the girth and the body length of the cow. (2)

3.2.2 Show, by means of calculations, that a cow with a girth of 70 inches and a body length of 78 inches has a weight of 577,88 kg.

You may use the formula:

Animal weight in pounds = $\frac{(\text{girth})^2 \times \text{body length}}{300}$

Note: 1 kg = 2,2046 pounds (4)

[26]

QUESTION 4

4.1 A team of netball players from Jacobsdal Agricultural School together with their coach travelled to Cape Town to attend the netball world cup final match. Due to the unavailability of accommodation at Cape Town they booked at a hotel in Paarl.

A map on ANNEXURE D shows the distances in kilometres from Paarl to Cape Town and the surrounding towns.

Use the information above and ANNEXURE D to answer the questions that follow.

4.1.1 Write down the name of the town that is closest to Paarl. (2)

4.1.2 On the day of the match, the team together with their coach left the hotel at 08:30 in the morning. They travelled to Waterfront Mall where they had their breakfast. It took them 1 hour and 57 minutes from the hotel until they left the mall to Cape Town International Convention Centre netball courts.

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(a) Write down the time that they left the mall. (2)

(b) Calculate the average speed, in km/h, of their vehicle from Paarl to Waterfront mall if it took them 58 minutes to travel to Cape Town CBD.

You may use the formula: **Distance = speed × time** (6)

4.1.3 The school arranged a friendly match between their team and a High School in one of the towns around Paarl. Use the directions below to write down the town where the friendly match will take place.

- From Paarl, they travelled 25 km to Franschhoek.
- 28 km from the Franshoek, at the T-junction, they turned right.
- Their destination was the first town from the T-junction. (2)

4.2 The table below shows the accommodation arrangements for the team and their coach. The rates given are for one night only.

TABLE 1: RATES PER ROOM FOR ONE NIGHT

Rooms allocated	Number accommodated per room	Rates per room per night
3	4 adults	R2 800
4	2 adults	R2 950
1	1 adult	R3 200

NOTE: The team arrived at 17:00 on the 05th of August and checked out at 08:00 on the 07th of August
They travelled with a 22-seater bus that has a fuel consumption of 10,5ℓ/100 km.
The total distance for a round trip was 2769,2 km.

Use the information above to answer the questions that follow.

4.2.1 Write down the total number of players of the team. (2)

4.2.2 Explain the meaning of 'round trip' as used in the context. (2)

4.2.3 50% of the total amount for accommodation and petrol will be paid by the School Governing Body (SGB) and the other 50% will be shared equally amongst the members of the team including the coach.

Show, by means of calculations, that each member will pay R1 269,78c.

You may use R22,46 as the fuel price per litre. (9)

4.3 The table below shows the weight and height of the netball players. The information is used by the coach to select the appropriate position for each player.

	Weight (in kg)	**Height (in cm)**		**Weight (in kg)**	**Height (in cm)**
Player 1	51	167	Player 6	56	166
Player 2	66	180	Player 7	80	188
Player 3	78	190	Player 8	79	189
Player 4	80	181	Player 9	68	179
Player 5	81	187	Player 10	58	162

BMI STATUS

BMI (kg/m^2)	**Weight Status**
Below 18,5	Underweight
18,5 to 24,9	Normal
25,0 to 29,9	Overweight
30,0 and above	Obese

Use the information above to answer the questions that follow.

4.3.1 Write down, as a percentage, the probability of randomly selecting a player with a height less than 170 cm and a weight of 60 kg from all players. (2)

4.3.2 Determine the BMI status of a player with a height of 188 cm and a weight of 80 kg.

You may use the formula: $\textbf{BMI} = \frac{\textbf{mass (in kg)}}{(\textbf{height in metres})^2}$ (4)

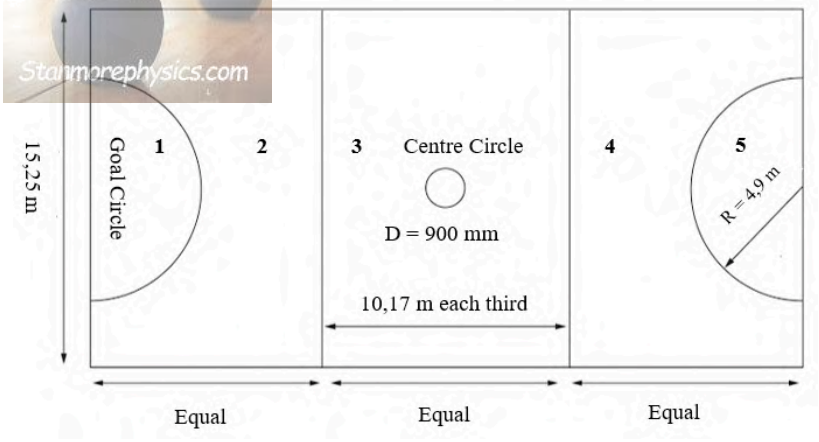
4.3.3 Each player has a specific playing area where they can be playing during the game. In table 2, the playing areas per playing positions are shown.

TABLE 2: PLAYING POSITIONS AND PLAYING AREAS

Player	Position	Playing Areas				
1	Goal Shooter	1	2			
2	Goal Attack	1	2	3		
3	Wing Attack		2	3		
4	Centre		2	3	4	
5	Wing Defence			3	4	
6	Goal Defence			3	4	5
7	Goalkeeper				4	5

Playing area: An area which a player is allowed to play in.

NETBALL COURT WITH SPECIFICATIONS



Where D = Diameter
R = Radius

1 – 5 are playing areas

Use the information above to answer the questions that follow.

(a) Write down which players are not supposed to play in the playing area 4 and 5. (3)

(b) Show, by means of calculations, that the difference between the radius of the goal circle and the radius of the centre circle is 4,45 m. (4)

(c) Calculate, (in m^2) the area of the netball court.

You may use this formula:

Area of rectangle = length × width (3)

[41]

QUESTION 5

5.1 Mr Bartman is a businessman who owns a printing company. He bought a two-bedroom house and turned it into an office space.

ANNEXURE E shows a floor plan of the house he bought.

Use the information above to answer the questions that follow.

5.1.1 Give ONE reason why the plan is referred to as an open floor plan. (2)

5.1.2 State the probability of randomly selecting a window on the western side of the house. (2)

5.1.3 Mr Bartman wanted to change the master bedroom to be a boardroom where he can be able to hold meetings. He removed everything so that he can change the flooring of the room and use carpet tiles.

The cost involved for carpet tiles:
- Carpet glue: 5ℓ for every 3 m^2
- One tin has 5ℓ of glue.
- Carpet glue price: R359,00 per tin
- Carpet tiles: R550 per m^2
- Cost for labour: R400 per m^2

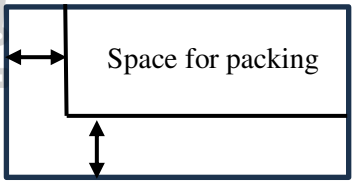
(a) Calculate the number of 5ℓ carpet glue tins that Mr Bartman must buy to cover the whole room.

You may use this formula:

Area of a rectangle = length × width (4)

(b) Determine the total cost to install the new flooring. (4)

5.2 Bedroom 2 will be used to store boxes of paper for printing purposes. 20% of the space on each side as shown on the picture below will not be used to allow movement when the packing and unpacking of the boxes is done.

LAYOUT PLAN FOR PACKAGING	PICTURE OF A BOX OF PAPER	DIMENSIONS OF THE BOX
		Length = 28 cm Width= 23 cm Height = 31,8 cm

Use the information above to answer the questions that follow.

5.2.1 One of the employees stated that they will be able to pack seven layers of boxes in the bedroom.

Verify, using calculations, whether his statement is VALID. (5)

5.2.2 Calculate the maximum number of boxes that can be packed in the bedroom if the length of the box is packed along the width of the room and the width of the box along the length of the room. (8)

[25]

TOTAL: 150

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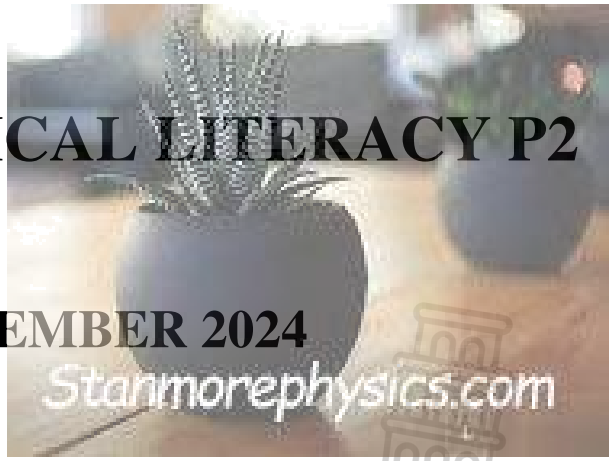
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GRADE 12

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SEPTEMBER 2024

ADDENDUM

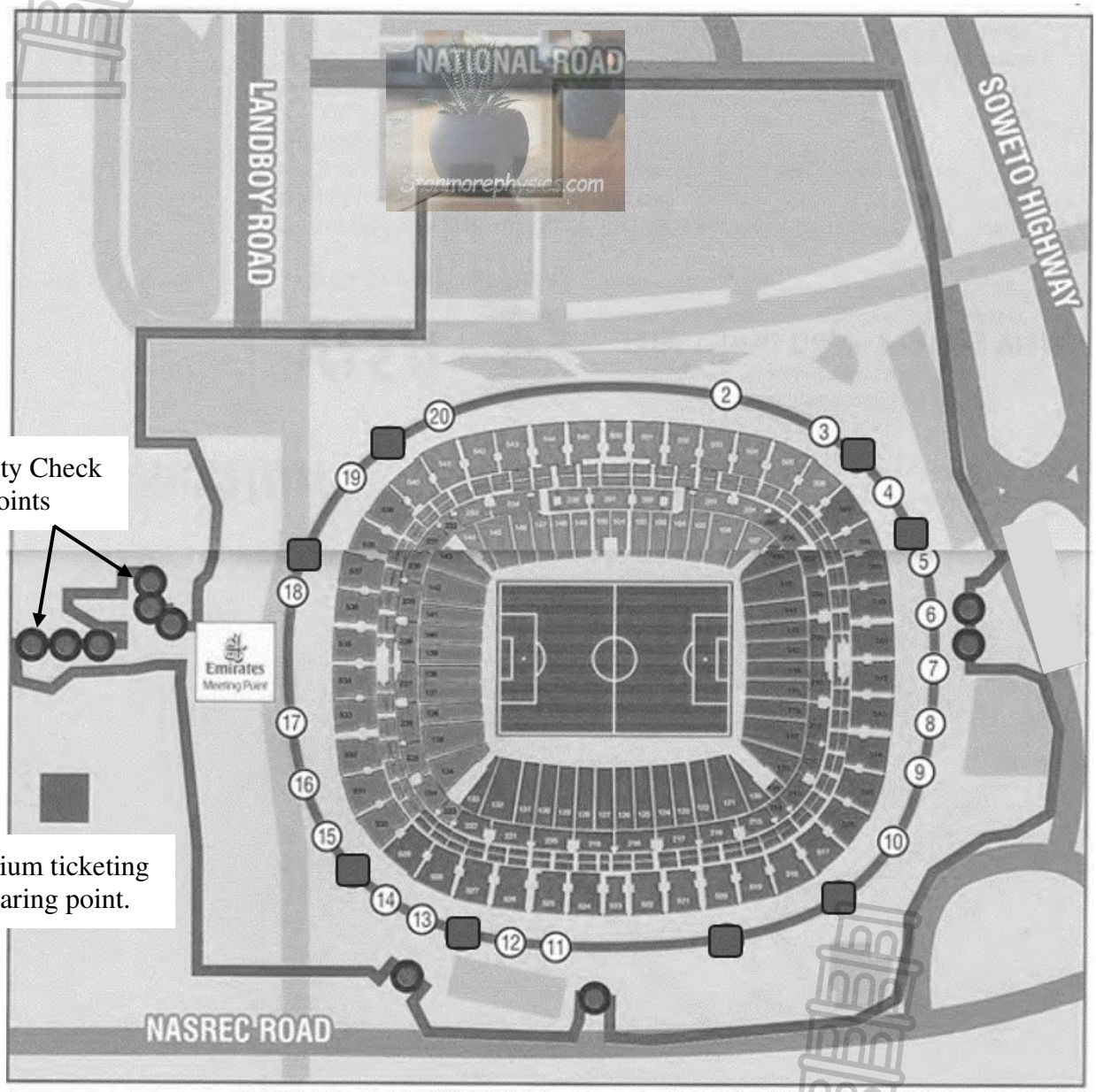
This addendum consists of 6 pages with 5 annexures.

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ANNEXURE A

QUESTION 1.1

SEATING LAYOUT PLAN OF SOCCER CITY STADIUM



Stadium Map Key

Entrances (4)

Ticket clearing points.

ANNEXURE B

QUESTION 1.2

ITEM LIST



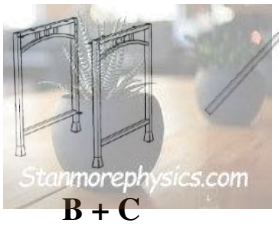
A
Top Unit



F
Back Stretcher



H
Drawer Front



B + C
Side Frames

Wrench



D
Front Rail



Flat Washer
9 pieces



Tapered Wood Screw
7 pieces



Tapered Head
Cap Bolt
5 pieces



E
Middle Rail



Spring Washer
8 pieces



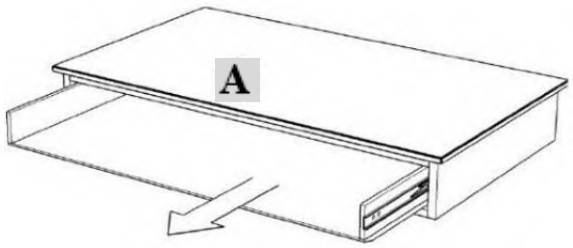
Wood Screw
11 pieces



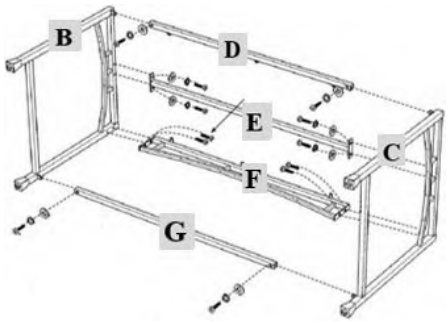
Head Cap Bolt
9 pieces

STEPS TO ASSEMBLE A TABLE

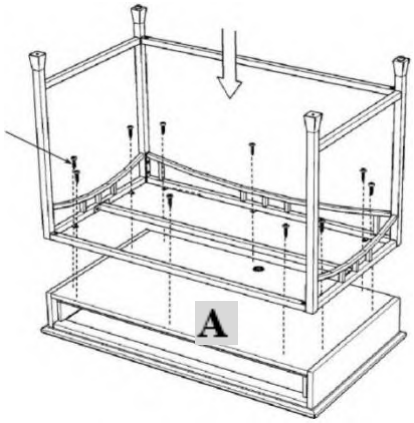
STEP 1



STEP 2



STEP 3



STEP 4



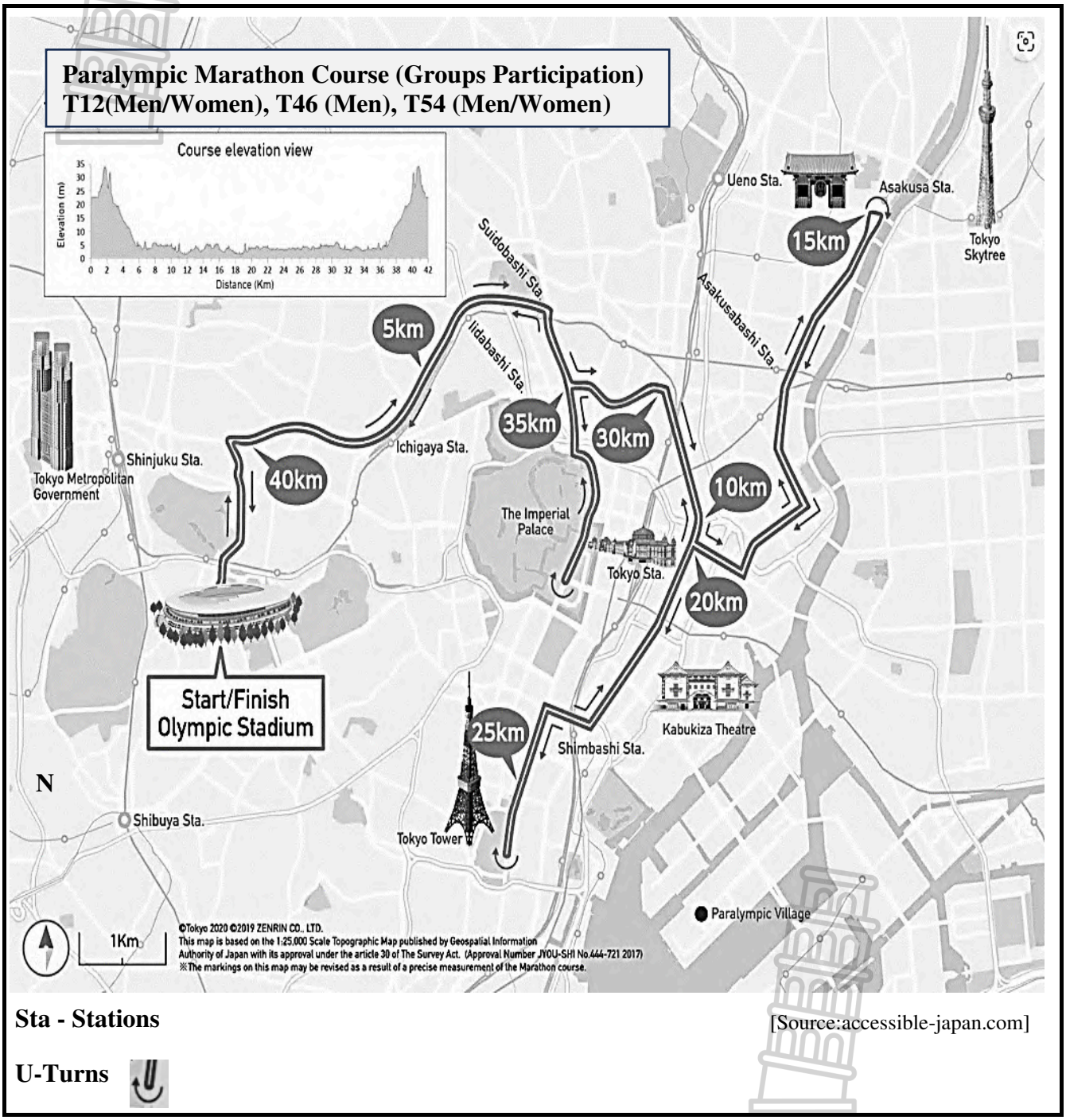
Final Product



[Source:shwdesks.com]

ANNEXURE C

QUESTION 2.1



Sta - Stations

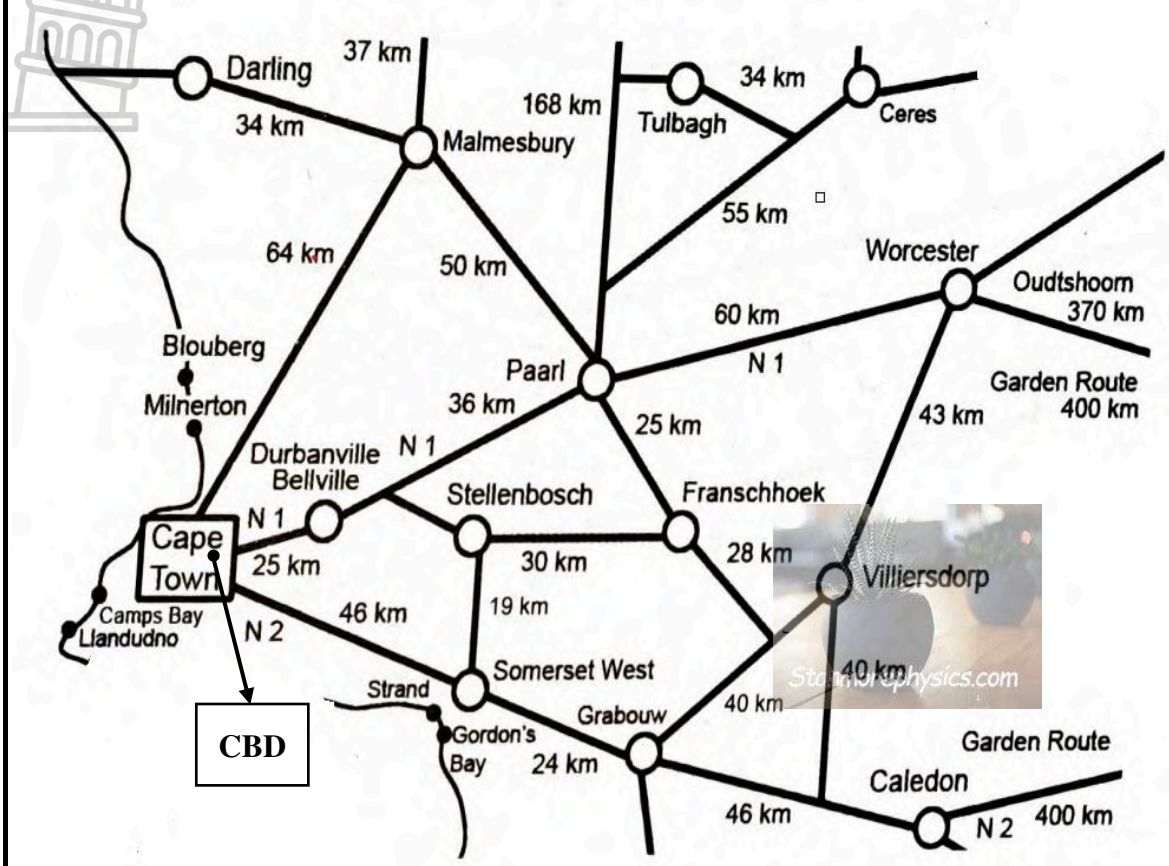
[Source:accessible-japan.com]

U-Turns

ANNEXURE D

QUESTION 4.1

ROUTE MAP FROM PAARL TO CAPE TOWN AND SURROUDING TOWNS



MAP FROM CAPE TOWN CBD TO WATERFRONT



[Source:booking.com]

ANNEXURE E

QUESTION 5.1



KEY:	
Window	
Door	

Dimensions of bedroom 2	Dimensions of Master Bedroom
Length = 3 m	Length = 3 m
Width = 2,6 m	Width = 3 m
Height of the wall = 2,4 m	

[Source: nethouseplans.com]