education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

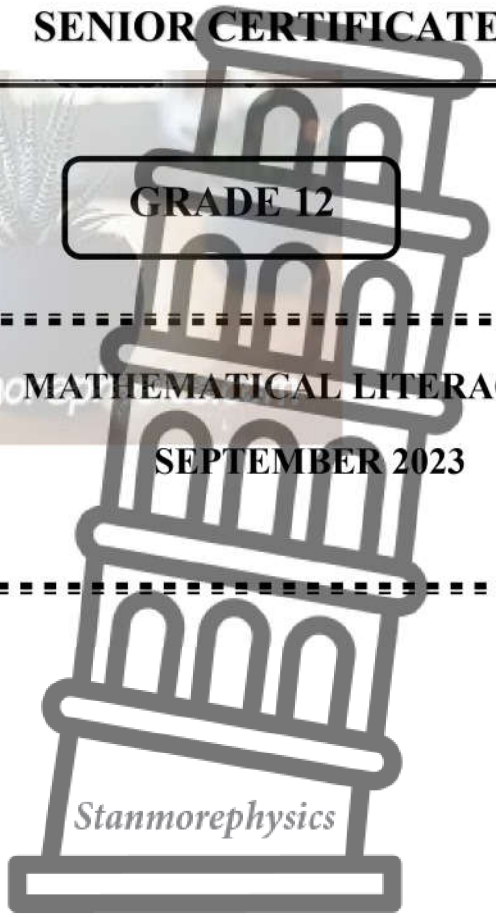
NATIONAL

SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

SEPTEMBER 2023



MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages and an addendum with 5 annexures.

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INSTRUCTIONS AND INFORMATION

1. This 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 2.1
   ANNEXURE B for QUESTION 2.2
   ANNEXURE C for QUESTION 4.1
   ANNEXURE D for QUESTION 5.1
   ANNEXURE E for QUESTION 5.2

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 of ALL final answers appropriately according to the given context, unless stated otherwise.
8. Indicate units of measurement, where applicable.
9. Maps and diagrams are NOT drawn to scale, unless stated otherwise.
10. Write neatly and legibly.



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QUESTION 1

1.1 Below is the picture of the Titanic ship, starting its maiden voyage.

- The ship was launched on 31 May 1911, at 12:15.
- It left Belfast to sail to Southampton, England.
- Its maiden voyage started on 10 April 1912, at noon.
- On Sunday, 14 April 1912, it struck an iceberg at 11:40 and sank on 15 April 1912, at 02:20.
- The wreck was found on 1 September 1985.



[Adapted from www.titanicstory.com]

Use the information above to answer the questions that follow.

1.1.1 Name the town where the Titanic's maiden voyage started. (2)

1.1.2 Name the time of day that the Titanic's maiden voyage started. (2)

1.1.3 Determine the day on which its maiden voyage started. (2)

1.1.4 Calculate the total number of hours and minutes, from the start of its maiden voyage to the day it sank. (3)

1.1.5 Calculate how many years after the ship sank the wreckage was found. (2)

1.1.6 Write down the launch time of the ship in words. (2)

1.2 The Titanic was 882 feet 9 inches (269,06 m) long, with a maximum width of 92 feet 6 inches (28 m) and had a mass of 46,328 gross tons. Its total height, measured from the base of the keel* to the top of the bridge, was 104 feet (32 m). It had ten decks, (excluding the officers' quarters) eight of which were for passenger use only.
*Keel – bottom of the ship.

Use the information above to answer the questions that follows.

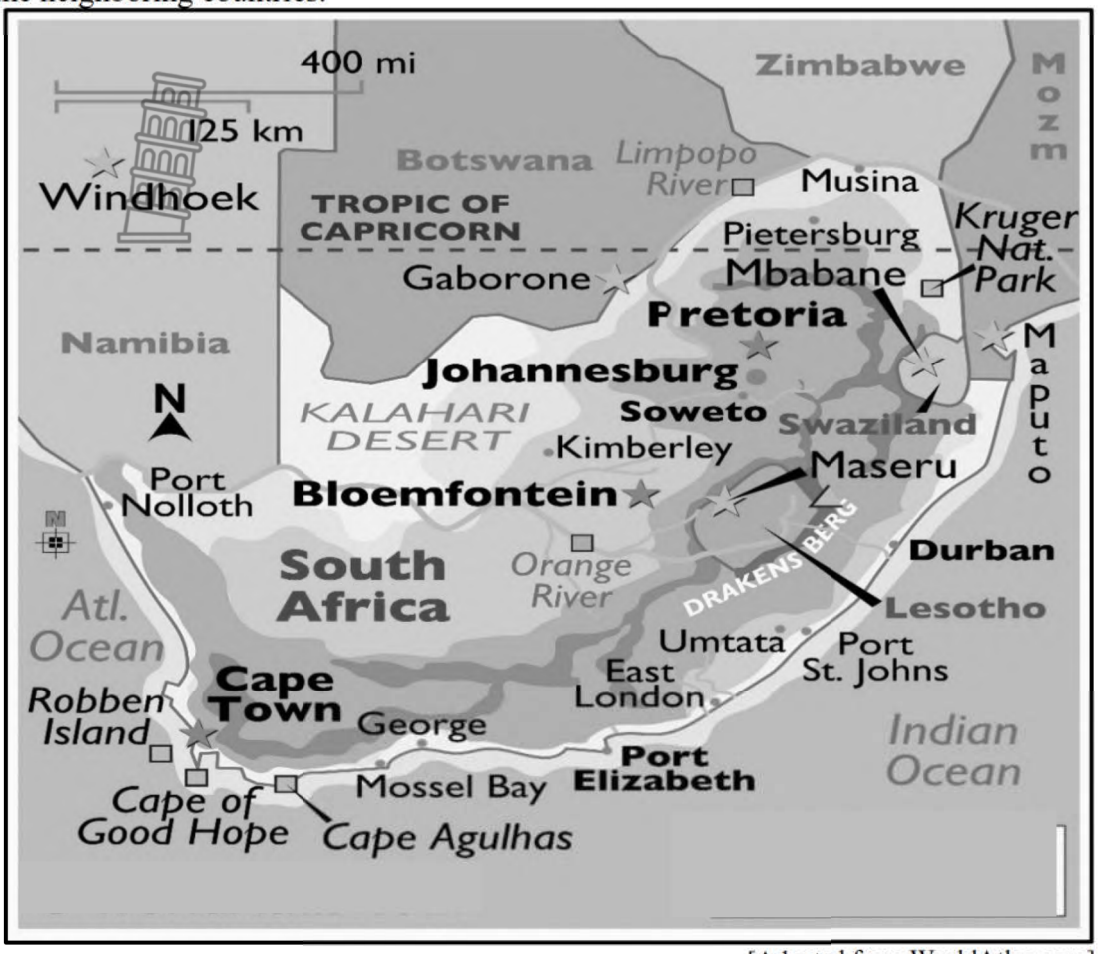
1.2.1 Determine (using m), the unit ratio of the maximum width to the total height of the Titanic. (2)

1.2.2 Determine the number of decks used for the officers. (2)

1.2.3 Calculate, in feet and inches, the difference between the length and the width of the Titanic. (3)

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1.3 Below is a map of the South African coastline and the interior parts of the country, including some neighboring countries.



[Adapted from WorldAtlas.com]

Use the information given above and answer the questions that follow.

1.3.1 State the TWO rivers that appear on the map. (2)

1.3.2 Name the ocean on the eastern side of South Africa. (2)

1.3.3 Name the island closest to Cape Town. (2)

1.3.4 Identify the mountain range on the map. (2)

1.3.5 State ONE advantage of using the scale shown on the map. (2)

[30]

QUESTION 2

2.1 Thato and Phumi, who stay in Durban, are on their way to the Kruger National Park.

ANNEXURE A shows different routes that can be used to fly to the Kruger National Park.

Use ANNEXURE A to answer the questions that follows.

2.1.1 Write down the number of airports shown on the map. (2)

2.1.2 In which general direction is Nelspruit from Durban? (2)

2.1.3 Determine the time it will take Thato and Phumi to fly from Durban to Hoedspruit. (3)

2.1.4 Their flight was on time and left Durban Airport at 07:59 am.

Determine the flying time, from Durban to Hoedspuit, excluding any stopping time. (3)

2.1.5 At the Hoedspruit Airport, Thato and Phumi hired a car and drove to the Kruger National Park.

- They left the airport at 12:41 and stopped for 45 minutes on their way for lunch.
- They drove at an average speed of 90 km/h and arrived at the Kruger National park at 14:21.

Calculate the distance from the airport to their destination.

You may use the formula: **Speed = Distance ÷ Time** (8)

2.1.6 On arrival at the Kruger National Park, the weather forecast showed there is a 0,652 chance of rain.

a) Determine, as a percentage, the probability for this rainfall. (2)

b) Explain, giving a reason, whether it will definitely rain or not. (3)

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2.2 ANNEXURE B shows a layout of a passenger's aeroplane Airbus A380.

Use ANNEXURE B to answer the questions that follow.

2.2.1 Determine the number of exit doors indicated on the layout of the aeroplane. (2)

2.2.2 Write down the seat numbers of the United First-class seats, in the left side of the front row. (2)

2.2.3 a) Name and explain the meaning of the scale shown on the seating plan. (2)

2.2.3 b) The actual length of the aeroplane (from the cockpit to the end of the passenger cabin) is given as 50 m.

Calculate, correct to the nearest 10 mm, the length of the layout of the aeroplane provided. (4)

2.2.4 Determine the number of in seat power sockets in the Airbus A380. (2)

2.2.5 A passenger seated at E07, used the following route to move to another seat.

- From his seat, he passed seat D07.
- He turned left and walked down the passage, passing all Economy Plus seats.
- He continued straight, passing four more seats, turned right and sat in the middle seat.

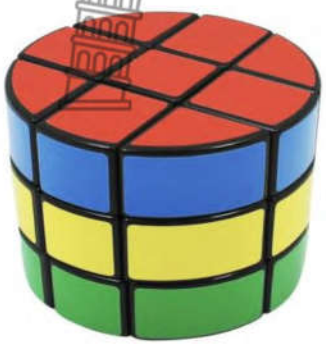
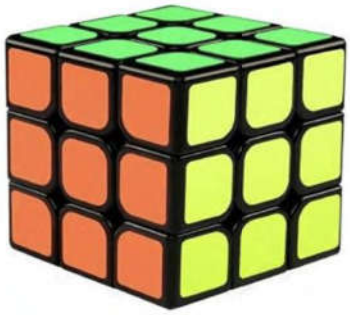
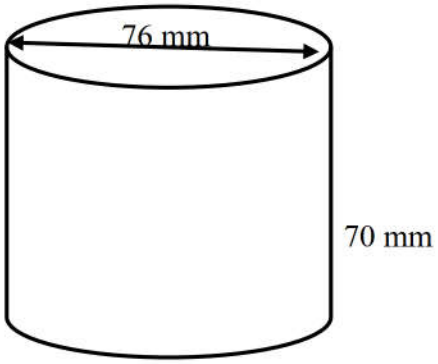
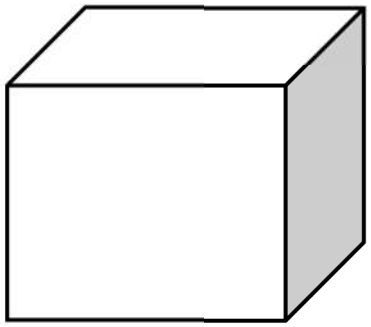
Write down his new seat number. (2)

[37]

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QUESTION 3

3.1 Magic cubes were popular 3D puzzle toys in the 1980's.

CYLINDRICAL MAGICAL CUBE	CUBIC MAGIC CUBE
	
DIMENSIONS OF A CYLINDRICAL MAGIC CUBE	**DIMENSIONS OF A CUBIC MAGIC CUBE**
	 Side = 55 mm

[Adjusted from bing.com/images]

Use the information above to answer the questions that follow.

3.1.1 Calculate the radius of the cylindrical magic cube. (2)

3.1.2 Calculate in cm^3, the volume of the cylindrical magic cube.

You may use the formula:

Volume of cylinder = 3, 142 × radius × radius × height. (3)

3.1.3 Determine the number of square sides of a cube. (2)

3.1.4 a) Define *total surface area* in this context. (2)

b) Calculate in mm^2, the total surface area of the magic cube.

You may use the formula: **Area of a square = side × side** (3)

3.2 TABLE 1 below shows the times and rankings of players and teams competing in magic cube tournament.

TABLE 1: TIME AND RANKINGS OF PLAYERS AND TEAMS

TAKE NOTE:

- **Player time** is the time taken by a player to solve the magic cube once.
- **Team time** is the total time taken by all players in a team to solve a magic cube once.
- The **rankings** of the players and teams are used to indicate the winners and the losers.

RANK	PLAYERS	PLAYER TIME	RANK	TEAM	TEAM TIME
1	Zoe	10,8 seconds	1	A	6 minutes 53 seconds
2	Enrique	13,6 seconds	2	B	7 minutes 44 seconds
3	Thabang	16,1 seconds	3	C	9 minutes 11 seconds
4	Koos	23,1 seconds	4	D	9 minutes 17 seconds
5	Bongani	23,2 seconds	5	E	9 minutes 23 seconds
6	Lee	23,9 seconds	6	F	9 minutes 28 seconds
7	Thulani	24,3 seconds	7	G	9 minutes 41 seconds
8	Liam	24,8 seconds	8	H	9 minutes 49 seconds
9	Gregory	26,7 seconds	9	I	9 minutes 59 seconds
10	Olivia	29,3 seconds	10	J	10 minutes 13 seconds

[Adapted from www.mindgamers.redbull.com]

Use the information in TABLE 1 above to answer the questions that follow.

3.2.1 Convert the winning team's time to seconds. (2)

3.2.2 Convert the total time taken by the players to solve the magic cube to minutes and seconds. (4)

3.2.3 Gregory is in team **I**, he claims that his team finished 30 seconds before team **J**, the losing team.

Verify, whether his statement is CORRECT. (3)

3.2.4 Determine, in decimal form, the probability that a player finished the magic cube in less than 20 seconds. (3)

3.2.5 Olivia states that although she came last, more than half of the players took longer than 20 seconds to complete the magic cube.

Verify, whether her statement is TRUE. (3)

[27]

QUESTION 4

4.1 The Star Flyer is a sail ship with 4 masts and 24 sails.
ANNEXURE C shows the Ship's Deck Plans.
The length of the ship is 360 feet and width is half of its length.



NOTE:
1 foot = 0,3048 metre

VOCABULARY:

Masts:
The mast of a sailing vessel is a tall spar, erected more or less vertically on the centre-line of a ship or a boat. Its purposes include carrying sails and giving necessary height to the navigation light.

[Adjusted from *Star Flyer - Star Clipper Cruises*]

Use ANNEXURE C to answer the questions that follows.

4.1.1 There are 3 decks on the ship. Determine the number of pools on the Sun Deck. (2)

4.1.2 a) Determine the total number of cabins on the ship. (3)

b) Hence calculate the number of windows on the ship. (2)

4.1.3 a) The dining room on the Clipper Deck covers $\frac{1}{3}$ of the total area of the ship.

Determine, in $(\text{feet})^2$, the area of the dining room.

You may use the formula: $\textbf{Area} = \textbf{length} \times \textbf{width}$ (5)

b) Convert the answer in QUESTION 4.1.3 (a) to the nearest square metre. (3)

4.1.4 Star Flyer cruise management decides to tile the dining room with grey vinyl tiles.

One box of tiles covers an area of 1,83 m by 5 m, and costs R842 per box.

The management stated that it would cost less than R250 000 to complete the project.

Verify, showing ALL calculations, whether the statement is VALID. (5)

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4.2 The picture below shows one of the tables in the dining room of the ship.



The following are the dimensions of the table:

Length = 270 cm Width = 90 cm Height = 76 cm

4.2.1 Show that the perimeter of the top of the table is 720 cm.

You may use the formula: **Perimeter of a rectangle = 2 × (length + width)** (2)

4.2.2 Each person occupies 60,96 cm space when seated around the table.

Determine the actual number of people that can sit comfortably around the table. (5)

[27]

QUESTION 5

5.1 Tom studied a strip chart that shows travelling routes from Windhoek in Namibia to Pretoria in South Africa.

ANNEXURE D shows a strip chart with road distances in kilometres from Pretoria to Windhoek.

Use ANNEXURE D to answer the questions that follow.

5.1.1 Identify the Game Reserve located 110 km from Zeerust. (2)

5.1.2 Name the Namibian town found closest to the border between Namibia and Botswana. (2)

5.1.3 Tom travelled from Tshane to Francis-town.

Calculate, in miles, the total distance he travelled.

NOTE: 1 mile = 1,609 km (5)

5.1.4 Give a reason why the length of the strip from Lobatse to Gaborone is shorter than the length of the strip from Rustenburg to Sun City, whereas the actual distances in the strip chart are nearly equal. (2)

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5.2 ANNEXURE E is the layout of Tom's house.

Use the information in ANNEXURE E to answer the questions that follow.

5.2.1 The area of a door opening is 9,5% more than the area of a bedroom window.

Calculate, in metres, the width of the door opening.

You may use the formula: **Area = length × width** (6)

5.2.2 Tom wants to paint the inside walls of the two bedrooms.

- The inside walls of the two rooms have a total surface area of 54,28 m^2.
- He applies two coats of paint with the spread rate of 3 m^2/litre.

Tom stated that he will need exactly 5 buckets to paint the rooms.

Verify, by showing ALL calculations, whether Tom's statement is CORRECT. (7)

5.2.3 Tom hired a painter who works on Fridays and Saturdays. His normal labour charge is R75,90 per hour.

- On Saturday he charges 50% more than the normal rate.
- On Fridays and Saturdays he works for six hours a day.

The painter gives Tom an invoice of R1 238.

Verify, whether the invoice is CORRECT. (5)

[29]

TOTAL: 150

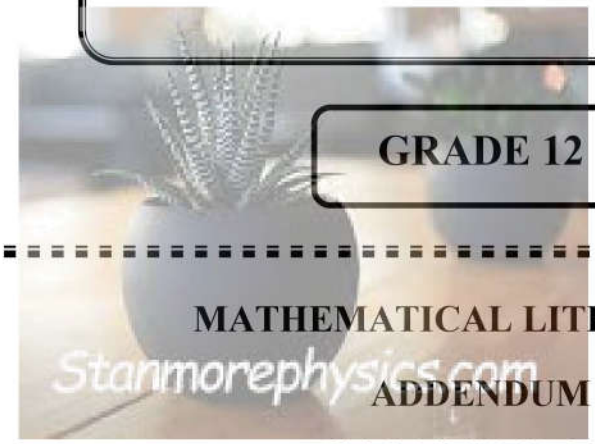
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GRADE 12



MATHEMATICAL LITERACY P2

ADDENDUM

SEPTEMBER 2023

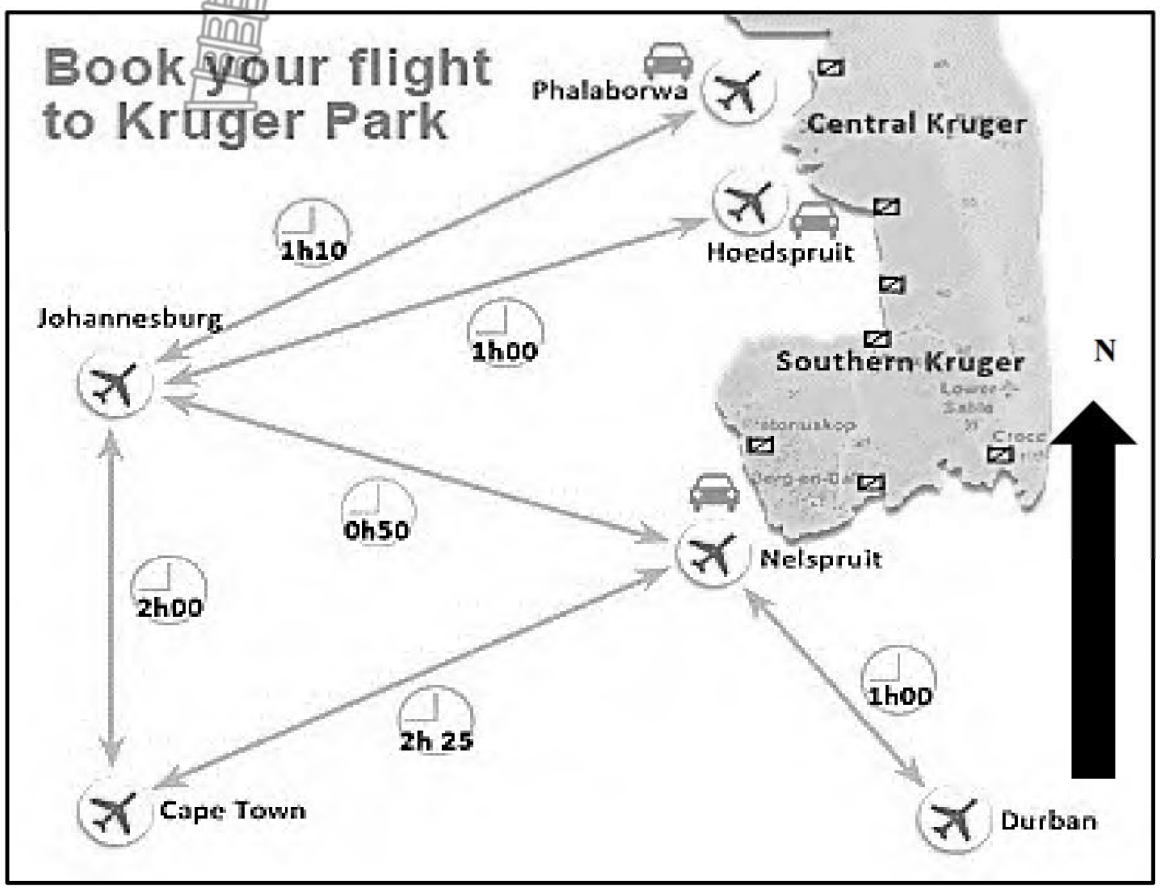
This addendum consists of 6 pages with 5 annexures.

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ANNEXURE A

QUESTION 2.1

DOMESTIC FLIGHTS - SOUTH AFRICA.



[Adapted from *Visiting Kruger National Park*]

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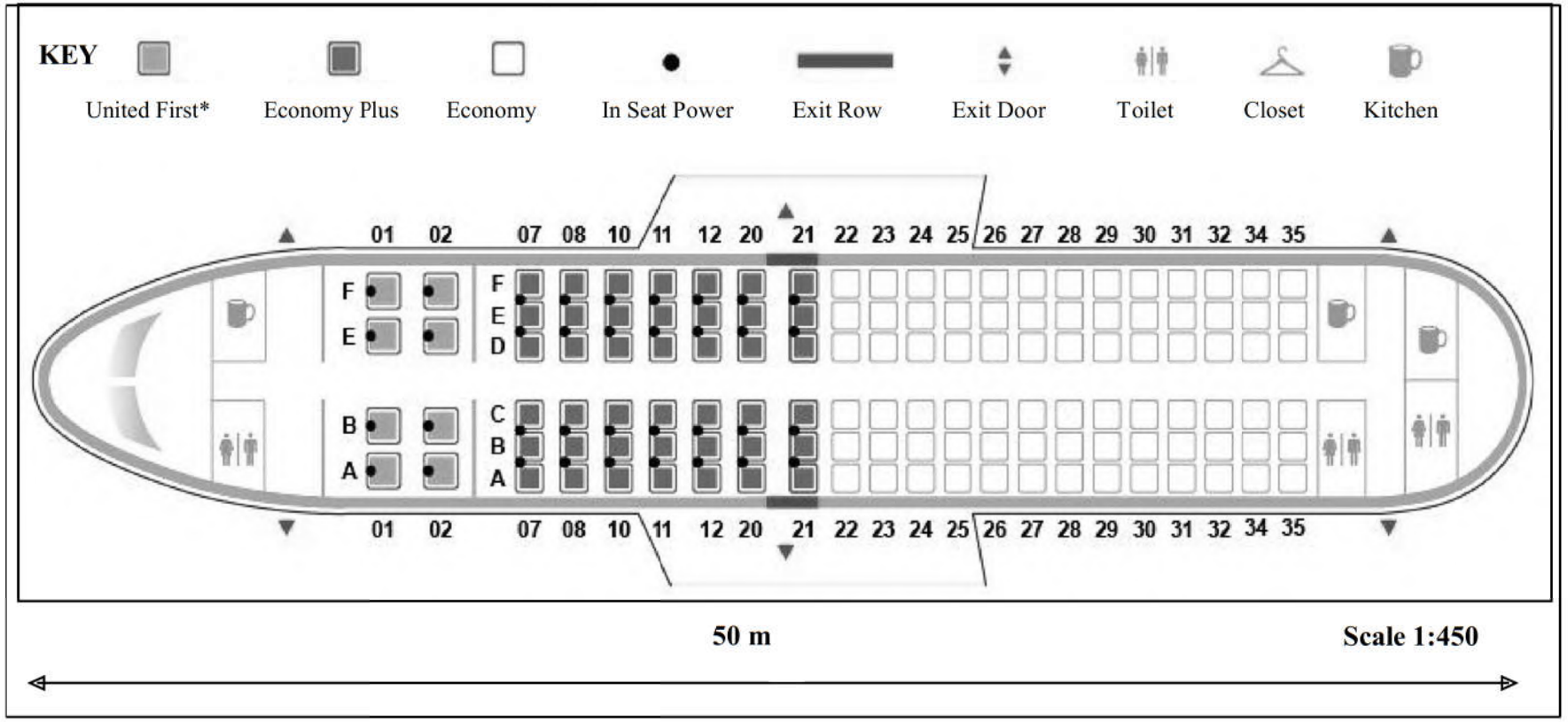
1h00 - Duration of flight

- Airport

- Direction of flight

ANNEXURE B

QUESTION 2.2 – LAYOUT OF A PASSENGERS AEROPLANE: AIRBUS A380

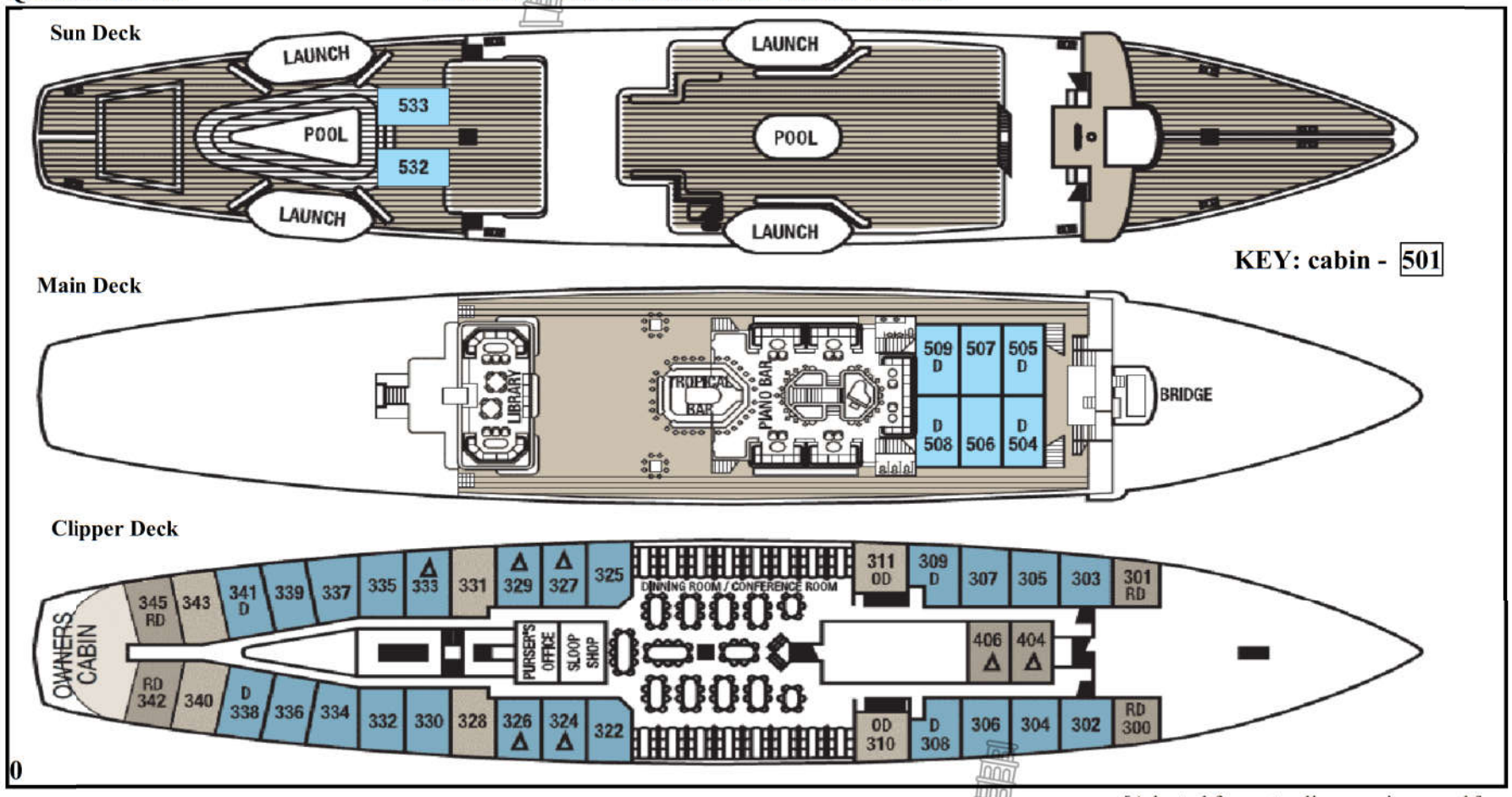


[Adapted from *Different Aircraft Layouts*]

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ANNEXURE C

QUESTION 4.1 **STAR FLYER CRUISE SHIP DECK PLANS**



[Adapted from starclippercruises.co.uk]

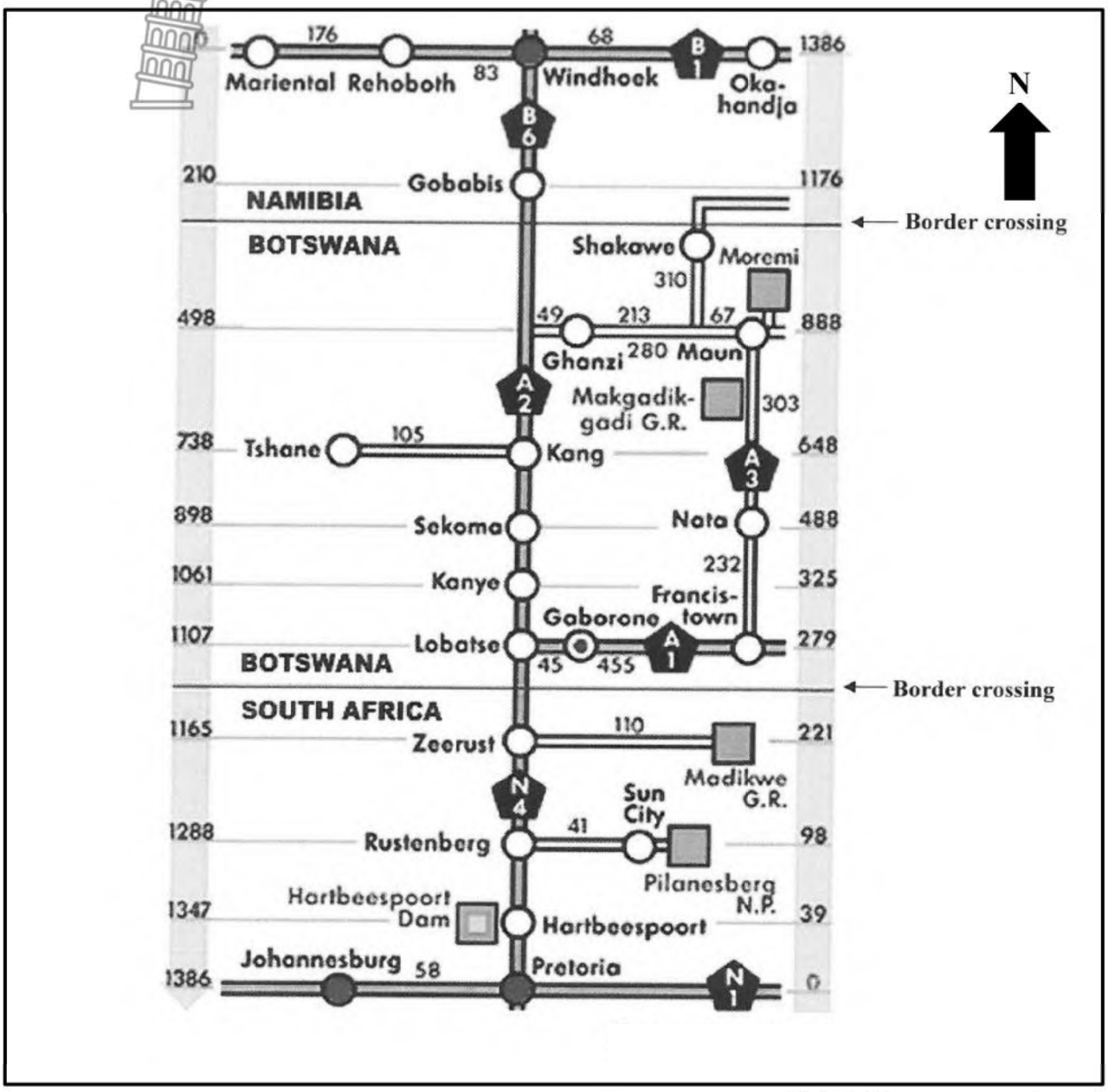
NOTE: Only the Commodore deck and Clipper Deck have windows. Each cabin on these two decks have only 1 window per cabin, except for cabins in the middle of the ships with NO windows, due to privacy.

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ANNEXURE D

QUESTION 5.1

STRIP CHART SHOWING ROAD DISTANCES IN KILOMETRES FROM WINDHOEK TO PRETORIA



[Adapted from www.google.com]

KEY

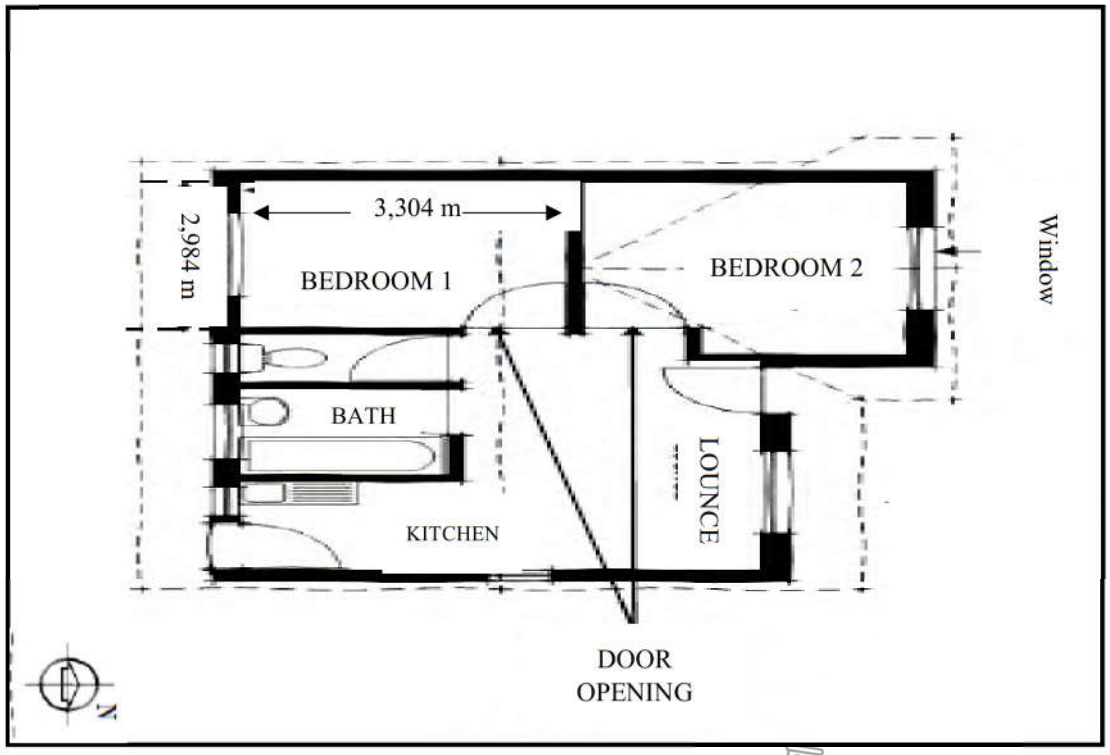
SYMBOL	DESCRIPTION
	Places of interest
N or A or B	National Roads
GR	Game reserve

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ANNEXURE E

QUESTION 5.2

THE DIAGRAM BELOW IS THE LAYOUT OF TOM'S HOUSE.



[Adapted from *SA House Plans*]

The dimensions of the windows in each bedroom are 170 cm × 140 cm
The height of a door opening is 2,14 m.

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