



**KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**MATHEMATICAL LITERACY P2**

**PREPARATORY EXAMINATION**

**SEPTEMBER 2025**

**MARKS: 150**

**TIME: 3 hours**

Stanmorephysics.com

**This question paper consists of 12 pages and a  
15-page SPECIAL ANSWER BOOK.**

**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of FIVE questions.
2. Answer ALL the questions in the SPECIAL ANSWER BOOK provided.
3. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
4. Show ALL calculations clearly.
5. Round off ALL final answers appropriately according to the given context, unless stated otherwise.
6. Indicate units of measurement, where applicable.
7. Maps and Diagrams are NOT necessarily drawn to scale unless stated otherwise.
8. Write neatly and legibly.

**QUESTION 1**

- 1.1 TABLE 1 below contains a list of explanations and definitions of concepts used in Mathematical Literacy.

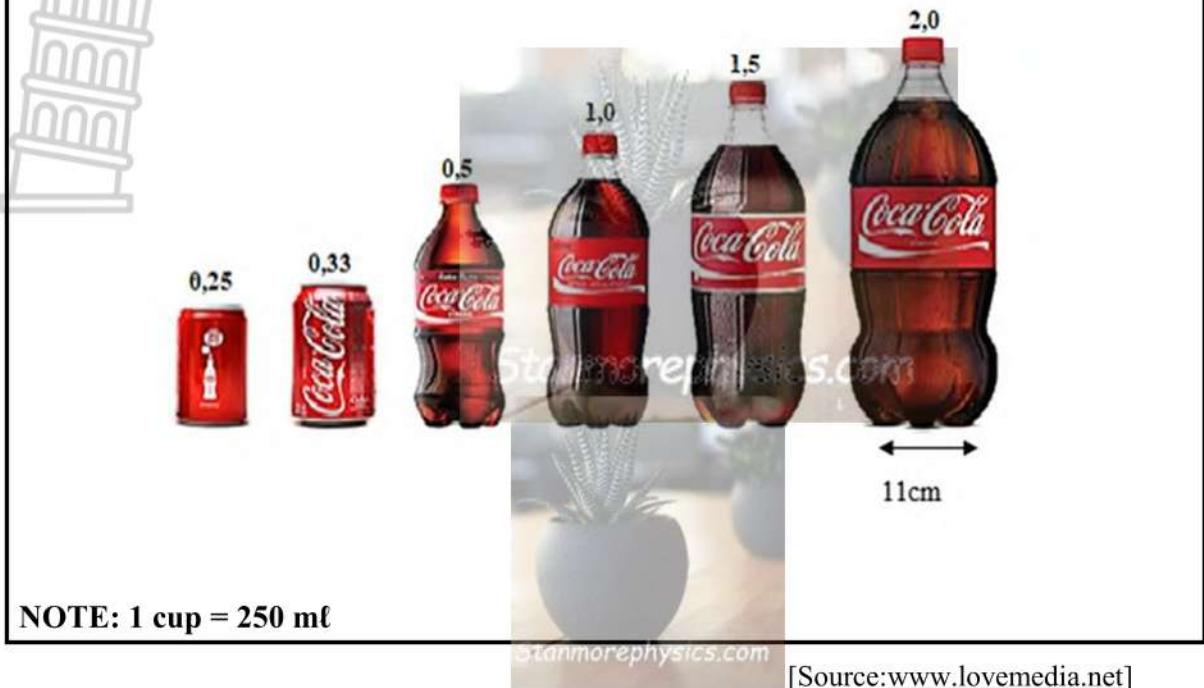
**TABLE 1: EXPLANATIONS AND DEFINITIONS OF CONCEPTS**

|   |  |
|---|--|
| A | The ratio that represents the measured distance and the actual distance  |
| B | The aerial view of the arrangement of rooms                              |
| C | The amount of space a 3D object occupies                                 |
| D | The side view of the outside of a building                               |
| E | The likelihood of an event taking place                                  |
| F | A statement about a future event based on historical data                |
| G | Total distance of the outline of a shape.                                |
| H | The maximum amount of space available to hold solids, liquids and gases. |

Use TABLE 1 above to write down the letter (A – H) of explanation or definition of EACH of the following concepts next to the question numbers (1.1.1 to 1.1.5) in the ANSWER BOOK, e.g. 1.1.5 J.

- 1.1.1 Volume. (2)
- 1.1.2 Scale. (2)
- 1.1.3 Perimeter. (2)
- 1.1.4 Floor plan. (2)
- 1.1.5 Probability. (2)

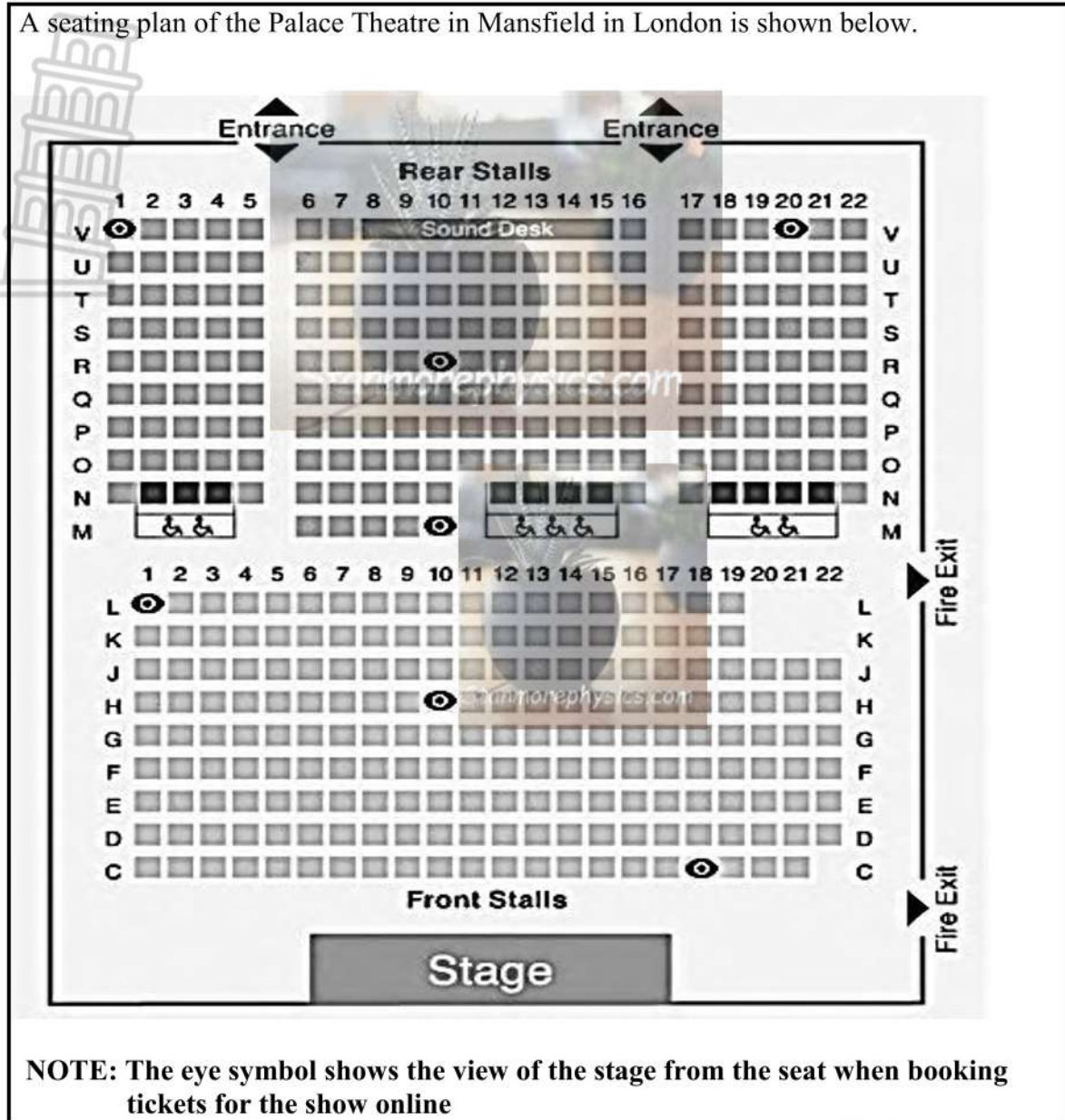
1.2 The image below displays various coke bottles and cans, along with the capacity of each container shown in litres



Use the image and information above to answer the following questions.

- 1.2.1 Convert 0,33 litres to ml. (2)
- 1.2.2 Determine the number of 250 ml cups of Coke contained in a 1.5-litre bottle. (3)
- 1.2.3 Determine the radius of the 2 litre bottle with a diameter of 11 cm. (2)
- 1.2.4 Choose **A**, **B** or **C**, the most correct formula below that can be used to calculate the volume of coke in a can.
  - A Volume =  $2 \times 3,142 \times \text{height}$
  - B Volume =  $3,142 \times \text{radius}^2 \times \text{height}$
  - C Volume =  $3,142 \times \text{height}$  (2)

1.3 A seating plan of the Palace Theatre in Mansfield in London is shown below.



[Adapted source: /www.mansfield.gov.uk/palacetheatre]

Use the seating plan above to answer the following questions.

- 1.3.1 Determine the total number of seats available for people with disabilities. (2)
- 1.3.2 Jabu is seated 6 rows away from the front stalls. The eye symbol is on his left. Identify the row and seat number he is seated at. (2)
- 1.3.3 Determine the number of seats that can be used for viewing the show in Row V. (2)
- 1.3.4 The show starts at 19:00, runs for 2 hours, with two 15-minute breaks. Determine the time the show will end. Write the answer in 12-hour time format. (3)

**QUESTION 2**

- 2.1 The Durban International Conference Centre (ICC) and the Durban Exhibition Centre (DEC) host various local and international events. The parking shown on the map is used by both Centres. ANNEXURE A in the ANSWER BOOK shows the map of the ICC and the DEC.

Use ANNEXURE A and the information above to answer the following questions.

- 2.1.1 State the importance of the key on the map in this context. (2)
- 2.1.2 Using the landmarks on the map, describe the relative position of the DEC. (2)
- 2.1.3 Name the main road that gives access to the ICC underground parking. (2)
- 2.1.4 Identify the compass direction of Sahara Stadium from the ICC. (2)
- 2.1.5 The total length of the ICC is approximately 300 metres. Determine the scale used on the map. (4)
- 2.1.6 Determine the probability, as a percentage, that a visitor to the ICC uses the North Plaza Parking. (4)

- 2.2 The Two Oceans Half marathon in Cape Town starts in Newlands and ends in Rondebosch. ANNEXURE B in the ANSWER BOOK shows a route map and elevation map of the half marathon.

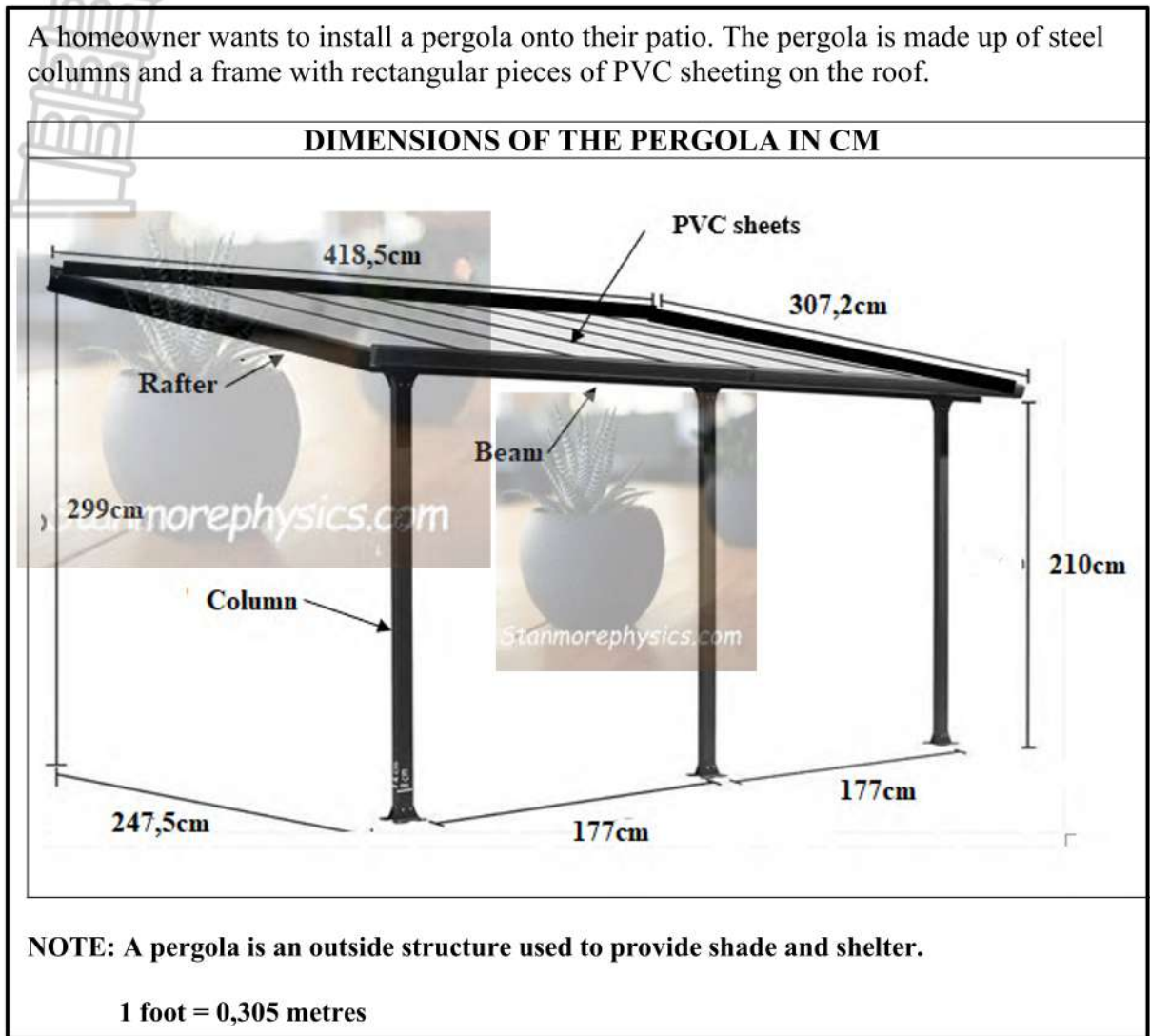
Use ANNEXURE B and the information above to answer the following questions.

- 2.2.1 Calculate a runner's speed in km per hour if the race must be completed in 3 hours 30 minutes.  
You may use the formula.  
**Distance = speed × time** (2)
- 2.2.2 Determine the altitude of the runner at the finish of the race. (3)
- 2.2.3 Last year's winner finished in 01:04:00. Determine the winner's average pace in minutes per kilometre. (2)
- 2.2.4 A runner stated that between the 5km and 15km mark, the altitude increased by 10m per km. Show by calculation if this is correct. (3)
- 2.2.5 14 934 of the 16 000 runners finished the race in 2024. Predict the number of runners in 2025 that are likely to finish the race if the entries increase to 17500. (4)
- 2.2.6 Explain the importance of attaching an elevation map to the route map. (3)

**[33]**

**QUESTION 3**

3.1 A homeowner wants to install a pergola onto their patio. The pergola is made up of steel columns and a frame with rectangular pieces of PVC sheeting on the roof.



[Adapted source:www.pinterest.com]

Use the diagram and the information above to answer the following questions.

3.1.1 Determine the total length of metal in metres required to make the frame of the pergola.

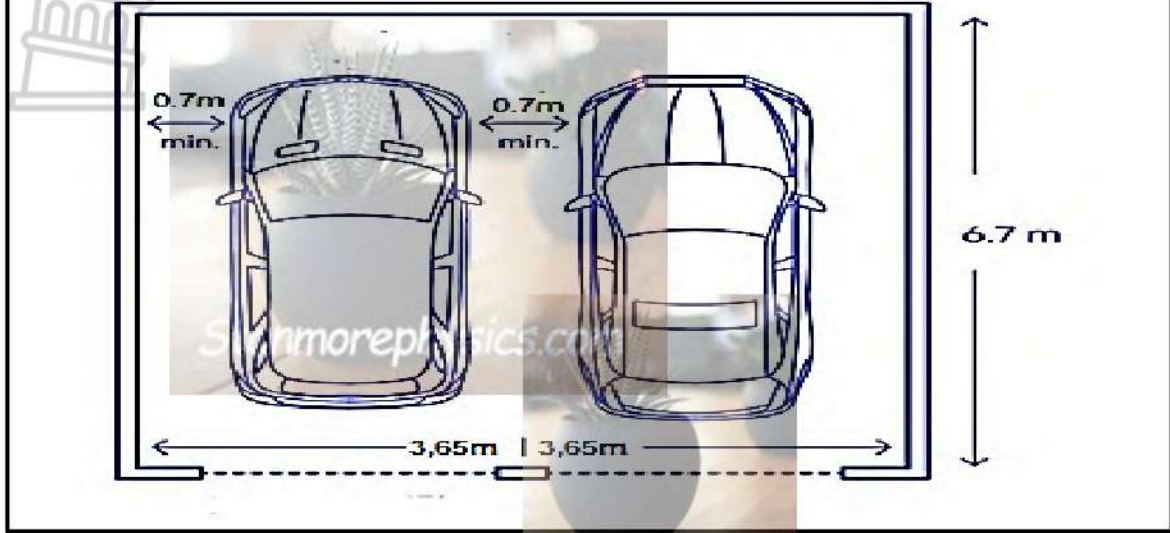
You may use the formula:

$$\text{Perimeter} = 2 (L + B) \tag{5}$$

3.1.2 The metal piping is sold in lengths of 20 feet. Determine the number of lengths that must be bought. (4)

3.1.3 Calculate the number of PVC sheets required to cover the roof of the pergola, if one sheets measures 60cm by 310cm. The sheets overlap each other by 5cm to prevent water from seeping through. (4)

3.2 The floorplan of a double garage is seen below. The owner of the garage wants to tile the garage. The image below displays the garage's internal dimensions, without including the thickness of the walls. The minimum clearance between the cars and the side walls, as well as the space between the two parked cars, is 0.7 metres.



Stanmorephys [Adapted source:www.pinterest.com]

Use the image and the information above to answer the questions that follow.

3.2.1 Determine the width of a car in the garage. Assume the width is the same for both cars. (5)

3.2.2 Calculate the area of the double garage.

You may use the formula:

**Area = length × breadth** (3)

3.2.3 The garage will be tiled using a 50 cm by 50cm tile. Determine the number of boxes of tiles that must be bought if there are 8 tiles in a box. (6)

[27]

**QUESTION 4**

4.1 The half circle table below is used in a classroom. The teacher sits in the centre and the children sit around the table.

|  |  |
|--|--|
| <b>DIMENSIONS OF HALF CIRCLE CLASSROOM TABLE IN INCHES</b> |  |
|  |  |
| <p><b>NOTE : 1 inch = 2,54 cm</b></p>                      |  |

[Adapted source www.pinterest. com]

Use the image and the information above to answer the following questions.

4.1.1 Determine the perimeter of the tabletop in inches.

You may use the formula:

$$\text{Circumference of the table} = [(2 \times 3,142 \times R) + (2 \times 3,142 \times r)] \div 2 + [D - d] \quad (6)$$

4.1.2 The teacher stated that the area of the table was 1,5m<sup>2</sup>.

Calculate the area of the table in m<sup>2</sup> shown above.

Verify his **CLAIM** by showing all calculations.

You may use the formula:

$$\text{Area of a circle} = 3,142 \times r^2 \quad (8)$$

4.2 The image below shows a 32 oz water bottle alongside the box it is sold in. The bottle is filled with water only up to the neck and not all the way to the top.



**NOTE: 1 ounce = 0,03 litres**  
**1000cm<sup>3</sup> = 1 litre**

[Adapted source [www.behance.net](http://www.behance.net)]

Use the image and information above to answer the following questions.

4.2.1 Calculate the diameter of the water bottle in cm.

You may use the formula:

**Volume = 3,142 × r<sup>2</sup> × height** (8)

4.2.2 Determine the dimensions of the box if the width of the box is 2cm more than the diameter of the bottle and the height of the box is 2cm more the total height of the bottle. (4)

4.2.3 Determine the surface area of the box in m<sup>2</sup>.

You may use the formula:

**Surface Area Rectangular Prism = 2(L × W) + 2(W × H) + 2(L × H)** (5)

[31]

**QUESTION 5**

5.1 The Trans African Highway connects Cape Town to Cairo, the capital of Egypt. The highway is 6 335 miles or 10 228 km. ANNEXURE C in the ANSWER BOOK shows the Trans African Highway from Cairo to Cape Town.

Use ANNEXURE C and the information above to answer the following questions.

5.1.1 Determine the conversion factor, rounded to 3 decimal places, of miles to km. (3)

5.1.2 Determine the number of countries one must travel through to reach Cape Town. (2)

5.1.3 Identify the type of scale shown on the map. (2)

5.1.4 Use the scale to calculate the actual distance in km from Cape Town to Cairo. (5)

5.1.5 Explain why the distance calculated in Question 5.1.4 does not match the distance given above in the context. (2)

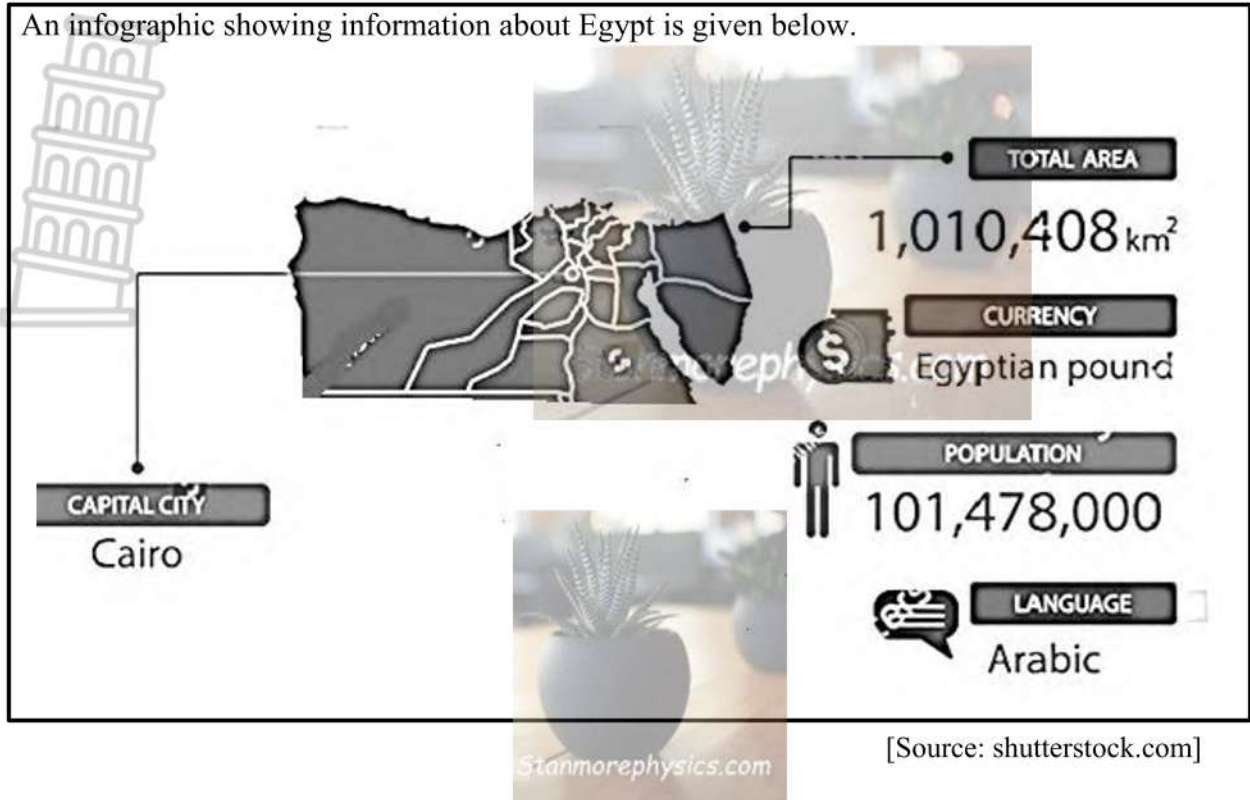
5.1.6 Determine the time taken in days (rounded up to the nearest day) to travel 10 228 km, if the driver travels at an average speed of 90 km/hour for 12 hours in a day. (5)

5.1.7 In Cairo the temperature reaches 98° F in summer. Determine the temperature in °C. Round off your answer to the nearest whole number.

You may use the formula:

$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$  (3)

5.2 An infographic showing information about Egypt is given below.



[Source: shutterstock.com]

Use the information above to answer the following questions.

- 5.2.1 South Africa has an estimated population of approximately 64 million. Calculate the ratio of South Africa's population to Egypt's population, expressed in unit form. (3)
- 5.2.2 Determine the number of people per km<sup>2</sup> in Egypt. (3)
- 5.2.3 South Africa has an area of 1 221 037 km<sup>2</sup>. It is 1,208 times bigger than Egypt. Verify, showing ALL calculations, if the claim is correct. (3)

[31]

**TOTAL MARKS: 150**



**KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

**NSC Answer Book / NSS Antwoordboek**

National Senior Certificate (Grade 12) / Nasionale Seniorsertifikaat (Graad 12)

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| PAPER NUMBER/<br>VRAESTEL NOMMER | <b>2</b> |
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| SUBJECT / VAK | <b>MATHEMATICAL LITERACY / WISKUNDIGE GELETTERDHEID</b> |
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| MARKER / NASIENER |                 |  | MODERATOR'S INITIALS IN RELEVANT BLOCK/ MODERATOR SE VOORLETTERS IN RELEVANTE BLOK |    |                 |    |                 |    |                 |    |                 |    |
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| Question/Vraag    | Marks/<br>Punte | Marker's Initials<br>/Nasiener se<br>voorletters | Marks/<br>Punte  | DH | Marks/<br>Punte | CM | Marks/<br>Punte | DM | Marks/<br>Punte | PM | Marks/<br>Punte | EM |
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| 5                 |                 |  |  |    |                 |    |                 |    |                 |    |                 |    |
|                   |                 | <b>TOTAL/<br/>TOTAAL</b>                         |  |    |                 |    |                 |    |                 |    |                 |    |


READ INSTRUCTIONS ON THE NEXT PAGE/  
LEES INSTRUKSIES OP DIE VOLGENDE BLADSY

**This answer book consists of 15 pages / Hierdie antwoordboek bestaan uit 15 bladsye**

**FOLLOW THESE INSTRUCTIONS CAREFULLY /  
VOLG HIERDIE INSTRUKSIES DEEGLIK**

1. Clearly write your examination number and centre number in the space provided and attach your barcode label in the space provided. / Skryf jou eksamennommer en sentrumnommer duidelik in die gegewe spasie en plak jou strepieskode op die plek wat aangedui is.
2. Remember that your own name (or the name of your school) may not appear anywhere on or in this answer book. / Onthou dat jou eie naam (of die naam van jou skool) nêrens op of in hierdie antwoordboek mag verskyn nie.
3. Answer ALL questions in the spaces provided. / Beantwoord ALLE vrae in die gegewe spasies.
4. No pages may be torn from this answer book. / Geen bladsye mag uit hierdie antwoordboek geskeur word nie.
5. Read the instructions printed on your timetable carefully as well as any other instructions which may be given in each examination paper. / Lees die instruksies op jou eksamenrooster deeglik deur, sowel as enige ander instruksies wat in elke eksamenvraestel gegee word.
6. Candidates may not retain an answer book or remove it from the examination room. / Kandidate mag nie 'n antwoordboek hou of dit uit die eksamenlokaal verwyder nie.
7. Answers must be written in black/blue ink as distinctly as possible. / Antwoorde moet so duidelik as moontlik in swart/blou ink geskryf word.
8. Do not write in the margins. / Moenie in die kantlyne skryf nie.
9. If you require additional space for your answers: / as jy ekstra plek nodig het vir jou antwoorde:
  - 9.1 Use the additional space provided at the end of the answer book / Gebruik die ekstra plek wat aan die einde van die antwoordboek voorsien is.
  - 9.2 When answering a question in the additional space, indicate clearly the question number in the column on the left-hand side / Wanneer jy 'n vraag in die ekstra spasie beantwoord, dui die vraagnommer duidelik aan in die kolom aan die linkerkant.
10. Draw a neat line through any work that must not be marked / Trek 'n netjiese streep deur enige werk wat nie gemerk moet word nie.

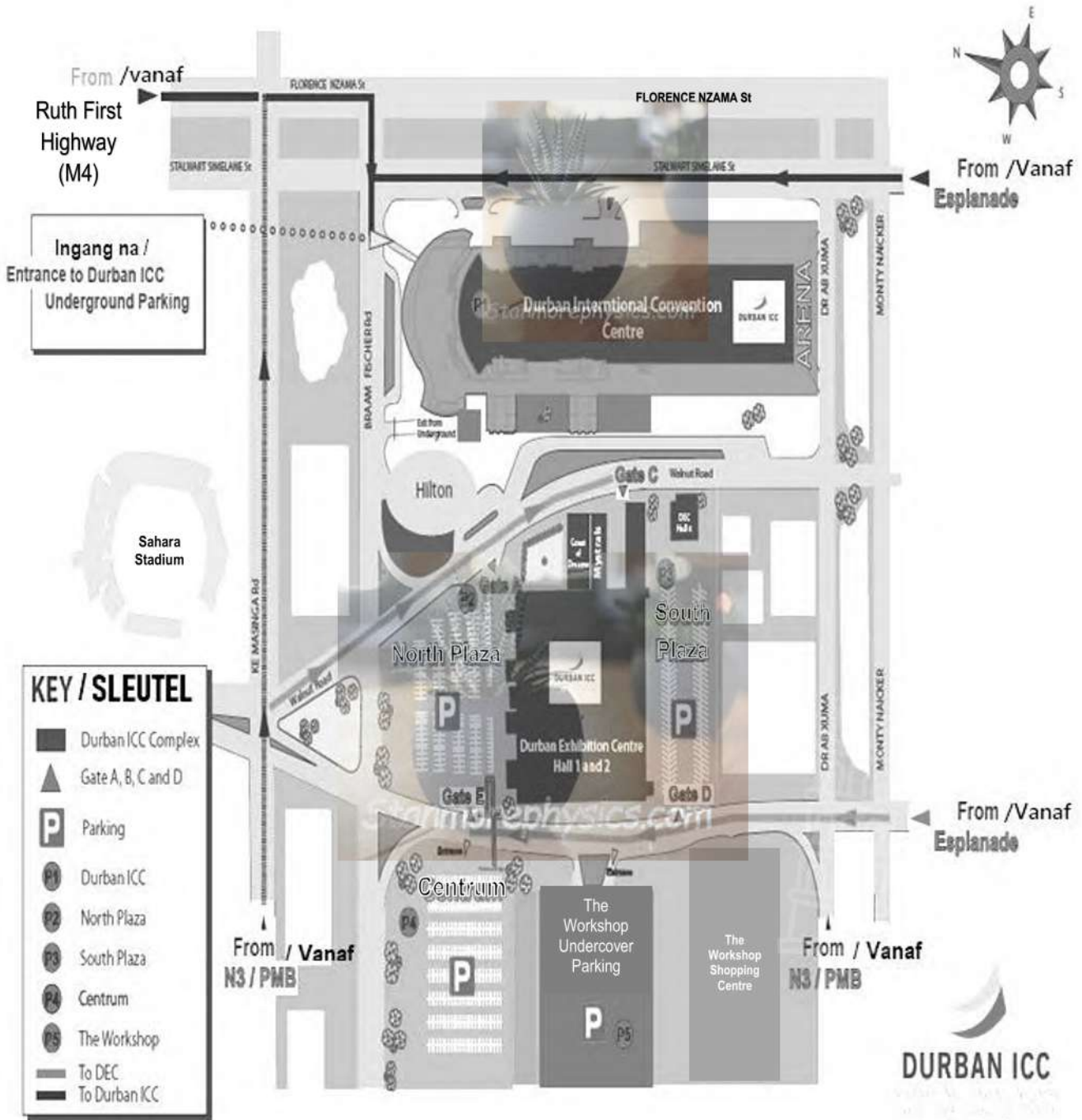
**QUESTION/VRAAG 1**

| 1.1   | Solution / Oplossing   | Marks/<br>Punte |
|-------|--|-----------------|
| 1.1.1 |  |                 |
|       |  | (2)             |
| 1.1.2 |  |                 |
|       |  | (2)             |
| 1.1.3 |  |                 |
|       |  | (2)             |
| 1.1.4 |  |                 |
|       |  | (2)             |
| 1.1.5 |  |                 |
|       |  | (2)             |
| 1.2.1 |  |                 |
|       |  | (2)             |
| 1.2.2 |  |                 |
|       |  |                 |
|       |  | (3)             |
| 1.2.3 |  |                 |
|       |  | (2)             |
| 1.2.4 |  |                 |
|       |  | (2)             |
| 1.3.1 |  |                 |
|       |  | (2)             |
| 1.3.2 |  |                 |
|       |  | (2)             |
| 1.3.3 |  |                 |
|       |  | (2)             |
| 1.3.4 |  |                 |
|       |  |                 |
|       |  |                 |
|       |  | (3)             |
|       |  | <b>[28]</b>     |

**QUESTION/VRAAG 2**

**2.1 ANNEXURE/BYLAAG A**

**MAP SHOWING LAYOUT OF THE DURBAN INTERNATIONAL CONFERENCE CENTRE (ICC) AND DURBAN EXHIBITION CENTRE (DEC) / KAART VAN DIE UITLEG VAN DIE DURBAN INTERNASIONALE KONFERENSIESENTRUM (DIK) EN DIE DURBAN UISTALLINGSENTRUM (DUS)**



[Source/Bron: www.icc.co.za]

|       | <b>Solution / Oplossing</b> | <b>Marks/<br/>Punte</b> |
|-------|-----------------------------|-------------------------|
| 2.1.1 |                             | (2)                     |
|       |                             |                         |
|       |                             |                         |
| 2.1.2 |                             | (2)                     |
|       |                             |                         |
|       |                             |                         |
| 2.1.3 |                             | (2)                     |
|       |                             |                         |
| 2.1.4 |                             | (2)                     |
|       |                             |                         |
| 2.1.5 |                             | (4)                     |
|       |                             |                         |
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| 2.1.6 |                             | (4)                     |
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**QUESTION/VRAAG 2**

**2.2 ANNEXURE/BYLAAG B**

**ROUTE AND ELEVATION MAP OF THE TWO OCEANS HALF MARATHON /  
 ROETE EN HOOGTEKAART VAN DIE TWEE OSEANE HALFMARATHON**



[Source/Bron: www.logdown.com]

|       | <b>Solution / Oplossing</b>  | <b>Marks/ Punte</b> |
|-------|--|---------------------|
| 2.2.1 |   | (2)                 |
| 2.2.2 |  | (3)                 |
| 2.2.3 |  | (2)                 |
| 2.2.4 |  | (3)                 |
| 2.2.5 |  | (4)                 |
| 2.2.6 |  | (3)                 |
|       |  | <b>[33]</b>         |





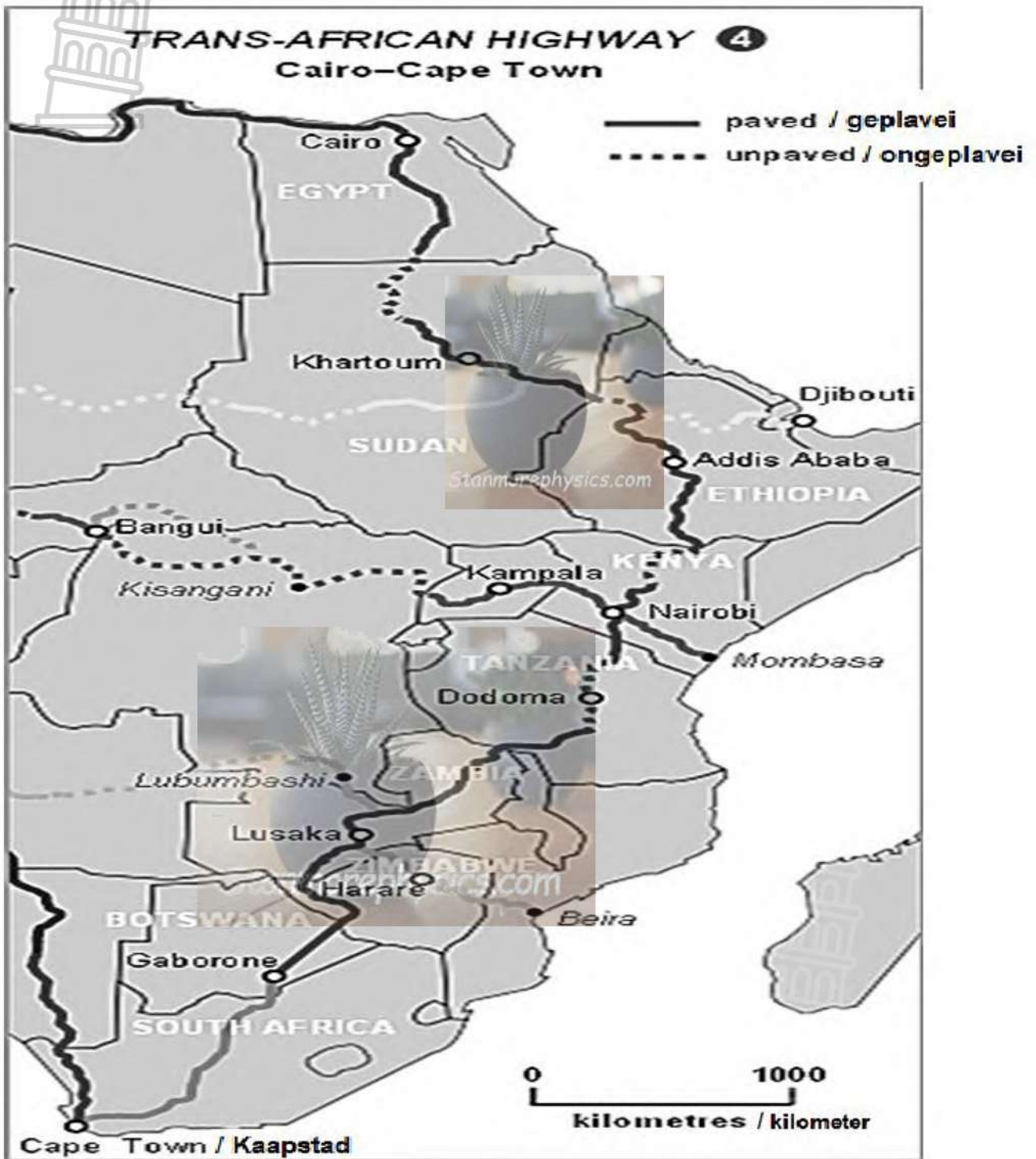
**QUESTION/VRAAG 4**

|       | <b>Solution / Oplossing</b>  | <b>Marks/<br/>Punte</b> |
|-------|--|-------------------------|
| 4.1.1 |  | (5)                     |
| 4.1.2 |  |                         |
| 4.2.1 |  | (8)                     |
| 4.2.2 |  |                         |

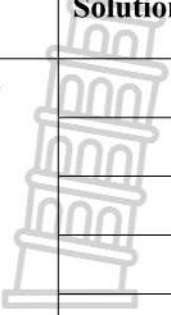

|       | <b>Solution / Oplossing</b>  | <b>Marks/<br/>Punte</b> |
|-------|--|-------------------------|
| 4.2.3 | <br><br>Stanmorephysics.com | (6)                     |
|       |  | <b>[31]</b>             |

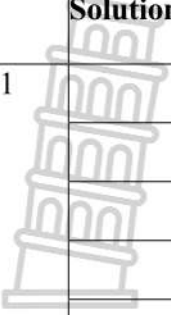

QUESTION/VRAAG 5

5.1 ANNEXURE/BYLAAG C



[Source/Bron:wikipedia.org]

|       | Solution / Oplossing  | Marks/<br>Punte |       |  |       |     |
|-------|---|-----------------|-------|--|-------|-----|
| 5.1.1 |  | (3)             |       |  |       |     |
|       |   |                 | 5.1.2 | (2)  |       |     |
|       |   |                 |       |  | 5.1.3 | (2) |
|       |   |                 | 5.1.4 |  |       |     |
| 5.1.5 | (2)   |                 |       |  |       |     |
|       |   | 5.1.6           |       |  | (5)   |     |
| 5.1.7 | (3)   |                 |       |  |       |     |

|       | Solution / Oplossing   | Marks/<br>Punte |     |     |             |
|-------|--|-----------------|-----|-----|-------------|
| 5.2.1 |   | (3)             |     |     |             |
| 5.2.2 |  |                 | (3) |     |             |
| 5.2.3 |  |                 |     | (3) |             |
|       |  |                 |     |     | <b>[29]</b> |
|       |  |                 |     |     |             |
|       |  |                 |     |     |             |
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| Additional space / Ekstra spatie | Marks/<br>Punte |
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**TOTAL MARKS: /**  
**TOTAAL PUNTE: 150**



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REPUBLIC OF SOUTH AFRICA

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**MATHEMATICAL LITERACY P2**

**MARKING GUIDELINES**

**PREPARATORY EXAMINATION**

**SEPTEMBER 2025**

**MARKS: 150**

| <b>SYMBOL</b> | <b>EXPLANATION</b>  |
|---------------|---|
| MA            | Method with accuracy                                      |
| MCA           | Method with consistent accuracy                           |
| CA            | Consistent Accuracy                                       |
| A             | Accuracy (Answer)   |
| C             | Conversion  |
| S             | Simplification  |
| RT            | Reading from a table/ graph/ diagram/map                  |
| SF            | Correct substitution in a formula                         |
| O             | Opinion/ reason/deduction/example/Explanation             |
| R             | Rounding off  |
| F             | deriving a formula  |
| AO            | Answer only   |
| P             | Penalty e.g. for units, incorrect rounding off etc.       |
| NPR           | No penalty for correct rounding                           |
| NPU           | No penalty for omitting unit, but wrong unit is penalised |
| RCA           | Rounding with consistent accuracy                         |

**This marking guideline consists of 12 pages**

**NOTES:**

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled) version.
- Consistent accuracy (CA) applies in ALL aspects of the marking guidelines; however, it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra item presented.

**QUESTION 1[28 MARKS] ANSWER ONLY FULL MARKS**

| Quest. | Solution  | Explanation  | T & L         |
|--------|---|--|---------------|
| 1.1.1  | C ✓✓RT  | 2RT correct answer (2)   | M<br>L1<br>E  |
| 1.1.2  | A ✓✓RT  | 2RT correct answer (2)   | MP<br>L1<br>E |
| 1.1.3  | G ✓✓RT  | 2RT correct answer (2)   | M<br>L1<br>E  |
| 1.1.4  | B ✓✓RT  | 2RT correct answer (2)   | MP<br>L1<br>E |
| 1.1.5  | E ✓✓RT  | 2RT correct answer (2)   | P<br>L1<br>E  |
| 1.2.1  | Number of ml = $0,33 \times 1000$ ✓MA<br>= $330$ ✓A   | 1MA multiplying by 1000<br>1A correct answer (2)   | M<br>L1<br>E  |
| 1.2.2  | Number of cups = $(1,5 \times 1000) \div 250$ ✓MA<br>= $6$ ✓A<br><b>OR</b><br>Number of cups = $1,5 \div (250 \div 1000)$ ✓MA<br>= $6$ ✓A | 1MA multiplying by 1000<br>1MA dividing by 250<br>1A correct answer<br><b>OR</b><br>1MA dividing 250 by 1000<br>1MA dividing 0,25<br>1A correct answer (3) | M<br>L1<br>E  |
| 1.2.3  | Radius = $11 \div 2$ ✓MA<br>= $5,5$ cm ✓A   | 1MA dividing by 2<br>1A correct answer (2)   | MP<br>L1<br>E |
| 1.2.4  | B ✓✓A   | 2A correct answer (2)  | MP<br>L1<br>E |

|       |   |   |              |
|-------|---|---|--------------|
| 1.3.1 | 11 seats ✓✓RT   | 2RT correct answer (2)  | M<br>L1<br>E |
| 1.3.2 | H9 ✓✓RT   | 2RT correct answer (2)  | M<br>L1<br>E |
| 1.3.3 | 14 seats ✓✓RT   | 2RT correct answer (2)  | M<br>L1<br>E |
| 1.3.4 | <p style="text-align: right;">✓MA</p> <p>Time the show will end = 19:00 + 2hours +(15mins×2)</p> <p style="text-align: center;">= 21:30 ✓A</p> <p style="text-align: center;">= 9:30pm ✓A</p> | <p>1MA adding time</p> <p>1A correct answer</p> <p>1A correct time and format (3)</p> | M<br>L1<br>E |
|       |   | <b>[28]</b>   |              |




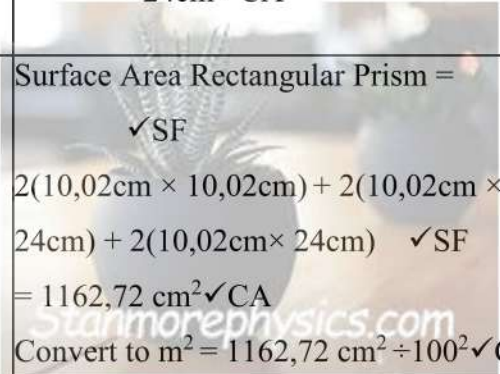
|       |  |  |                        |
|-------|--|--|------------------------|
| 2.2.1 | <p>Time = 3,5 hours</p> <p>Speed = <math>\frac{21,1\text{km}}{3,5} \checkmark \text{SF}</math></p> <p>= 6,03 km/hour <math>\checkmark \text{CA}</math></p>   | <p>1SF substitution</p> <p>1CA answer (2)</p>  | <p>MP<br/>L2<br/>M</p> |
| 2.2.2 | <p><math>\checkmark \checkmark \text{RT}</math></p> <p>100m <math>\checkmark \text{A}</math></p>   | <p>2RT correct answer</p> <p>1A units (3)</p>  | <p>MP<br/>L1<br/>E</p> |
| 2.2.3 | <p>Time = 64 minutes</p> <p>Average Pace = <math>\frac{64 \text{ minutes}}{21,1 \text{ km}} \checkmark \text{MA}</math></p> <p>= 3,03 minutes/km <math>\checkmark \text{CA}</math></p>   | <p>1MA dividing 64 by 21,1</p> <p>1CA answer (2)</p>   | <p>MP<br/>L2<br/>M</p> |
| 2.2.4 | <p>Altitude at 5km = 75m</p> <p>Altitude at 15km = 175m</p> <p>Change in Altitude = 175m - 75m <math>\checkmark \text{MA}</math></p> <p>= 100m</p> <p>Altitude increase per km = <math>100 \div 10 \checkmark \text{MCA}</math></p> <p>= 10m/km</p> <p>Statement is <b>CORRECT</b> <math>\checkmark \text{O}</math></p>  | <p>1MA subtracting heights</p> <p>1MCA dividing by 10</p> <p>1O Conclusion (3)</p>                   | <p>MP<br/>L4<br/>M</p> |
| 2.2.5 | <p>Predicted finishers for 2025 = <math>\frac{14\,934}{16\,000} \checkmark \checkmark \text{A} \times 17\,500 \checkmark \text{MA}</math></p> <p>= 16 334 <math>\checkmark \text{A}</math></p>   | <p>1A numerator</p> <p>1A denominator</p> <p>1MA multiply by 17 500</p> <p>1A correct answer (4)</p> | <p>P<br/>L2<br/>E</p>  |
| 2.2.6 | <p>The elevation plan shows the height above sea level at a certain distance. <math>\checkmark \checkmark \checkmark \text{O}</math></p> <p><b>OR</b></p> <p>Helps to prepare runners by knowing the steep climbs/descents to decide if the route matches their fitness level. <math>\checkmark \checkmark \checkmark \text{O}</math></p> <p><b>OR</b></p> <p>Identifying steep/dangerous areas to avoid accidents. <math>\checkmark \checkmark \checkmark \text{O}</math></p> | <p>3O correct explanation (3)</p>  | <p>MP<br/>L2<br/>M</p> |
|       |  | <p>[33]</p>  |                        |

| QUESTION 3 [27 MARKS] |  |  |                     |
|-----------------------|--|--|---------------------|
| Quest.                | Solution   | Explanation  | T & L               |
| 3.1.1                 | $\begin{aligned} \text{Perimeter of the frame} &= 2(418,5 \text{ cm} + 307,2 \text{ cm}) \checkmark \text{ SF} \\ &= 1451,4 \text{ cm} \checkmark \text{ A} \\ &= 1451.4 \text{ cm} \div 100 \checkmark \text{ C} \\ &= 14,514 \checkmark \text{ CA m} \checkmark \text{ A} \end{aligned}$             | 1SF correct substitution<br>1A correct answer<br>1C Conversion<br>1CA answer<br>1A for unit                  | M<br>L2<br>M<br>(5) |
| 3.1.2                 | $\begin{aligned} \text{Convert to metres} &= 20 \times 0,305 \\ &= 6,1\text{m} \checkmark \text{ A} \\ \\ \text{Number of lengths required} &= 14,514 \text{ m} + (3 \times 2,1 \text{ m}) \\ &= 20,814\text{m} \div 6,1 \checkmark \text{ MCA} \\ &= 3,41 \\ &= 4 \checkmark \text{ R} \end{aligned}$ | <b>CA from 3.1.1</b><br>1A correct answer<br>1MA multiplying 3 by 2,1<br>1MCA dividing by 6,1<br>1R rounding | M<br>L3<br>M<br>(4) |
| 3.1.3                 | $\begin{aligned} \text{Number of PVC sheets} &= 418,5 \text{ cm} \div (60\text{cm} - 5\text{cm}) \checkmark \text{ MCA} \\ &= 7,6 \checkmark \text{ CA} \\ &= 8 \checkmark \text{ R} \end{aligned}$  | 1MA subtracting 5<br>from 60<br>1MCA dividing by 55<br>1CA correct answer<br>1R rounding                     | M<br>L3<br>D<br>(4) |






|              |  |   |   |
|--------------|--|---|---|
| <p>3.2.1</p> | <p>Total length of the garage = 3,65 m + 3,65m = 7,3 m ✓ A</p> <p>Spaces between the cars = 3 × 0,7m = 2,1 m ✓ A</p> <p>Width of the car = 7,3 m – 2,1 m</p> <p style="padding-left: 40px;">= 5,2 m ✓ A</p> <p style="padding-left: 40px;">= 5,2m ÷ 2 ✓ MCA</p> <p style="padding-left: 40px;">= 2,6m ✓ CA</p>   | <p>1A for width of the garage</p> <p>1A for width of spaces</p> <p>1A correct answer</p> <p>1MCA dividing by 2</p> <p>1CA answer</p> <p style="text-align: right;">(5)</p>                                  | <p>M<br/>L3<br/>M</p>                         |
| <p>3.2.2</p> | <p style="text-align: right;">✓ MA</p> <p>Area of garage = (3,65m + 3,65m) × 6,7m ✓ SF</p> <p style="padding-left: 40px;">= 48,91m<sup>2</sup> ✓ A</p>   | <p>1MA adding correct values</p> <p>1SF substitution</p> <p>1A answer</p> <p style="text-align: right;">(3)</p>   | <p>M<br/>L2<br/>M</p>                         |
| <p>3.2.3</p> | <p style="text-align: right;">✓ C</p> <p>Convert to metres = 50 ÷ 100</p> <p style="padding-left: 40px;">= 0,5m</p> <p>Area of 1 tile = 0,5 m × 0,5 m = 0,25 m<sup>2</sup> ✓ A</p> <p>Number of tiles = 48,91 m<sup>2</sup> ÷ 0,25 m<sup>2</sup> ✓ MCA</p> <p style="padding-left: 40px;">= 195,64 ✓ CA</p> <p>Number of boxes = 195,64 ÷ 8 ✓ MCA</p> <p style="padding-left: 40px;">= 24,46</p> <p style="padding-left: 40px;">= 25 ✓ R</p> | <p><b>CA from Q3.2.2</b></p> <p>1C dividing by 100</p> <p>1A area of tile</p> <p>1MCA for dividing</p> <p>1CA answer</p> <p>1MCA dividing by 8</p> <p>1R Rounding</p> <p style="text-align: right;">(6)</p> | <p>M<br/>L4<br/>M</p>                         |
|              |  |   | <p style="text-align: right;"><b>[27]</b></p> |

| QUESTION 4 [31 MARKS] |  |  |   |
|-----------------------|--|--|---|
| Quest.                | Solution   | Explanation  | T & L   |
| 4.1.1                 | <p>Diameter of Big Circle = 76"</p> <p>Radius of big circle = <math>76'' \div 2 = 38''</math> ✓ A</p> <p>✓ MA</p> <p>diameter of small circle = <math>76'' - 24'' - 24'' = 28''</math> ✓ A</p> <p>radius of small circle = <math>28'' \div 2 = 14''</math> ✓ A</p> <p>Circumference of table</p> <p>= <math>[(2 \times 3,142 \times 38'') + (2 \times 3,142 \times 14'')] \div 2 + (76'' - 28'')</math> ✓ SF</p> <p>= 211,384" ✓ CA</p> <p style="text-align: center;"><b>OR</b></p> <p>Diameter of Big Circle = 76"</p> <p>Radius of big circle = <math>76'' \div 2 = 38''</math> ✓ A</p> <p>✓ MA</p> <p>diameter of small circle = <math>(76'' \div 2) - 24'' = 28''</math> ✓ A</p> <p>radius of small circle = <math>28'' \div 2 = 14''</math> ✓ A</p> <p>Circumference of table</p> <p>= <math>[(2 \times 3,142 \times 38'') + (2 \times 3,142 \times 14'')] \div 2 + (76'' - 28'')</math> ✓ SF</p> <p>= 211,384" ✓ CA</p> | <p>1A correct answer</p> <p>1MA subtracting 48</p> <p>1A correct answer</p> <p>1A correct answer</p> <p>1SF substitution</p> <p>1CA correct Answer</p> <p style="text-align: center;"><b>OR</b></p> <p>1A correct answer</p> <p>1MA dividing by 2 and subtracting 24</p> <p>1A correct answer</p> <p>1A correct answer</p> <p>1SF substitution</p> <p>1CA correct Answer</p> | <p>M</p> <p>L4</p> <p>M</p> <p style="text-align: right;">(6)</p> |

|       |  |  |                       |
|-------|--|--|-----------------------|
| 4.1.2 | <p>Radius of Big Circle = <math>38'' \times 2,54 \checkmark C</math><br/> <math>= 96,52 \text{ cm}</math></p> <p>Radius of small circle = <math>14'' \times 2,54</math><br/> <math>= 35,56 \text{ cm}</math></p> <p><b>Area = area of big circle – area of small circle</b></p> <p>Area of big circle = <math>3,142 \times (96,52\text{cm})^2 \checkmark SF</math><br/> <math>= 29\,271,2188768 \text{ cm}^2</math></p> <p>Area of small circle = <math>3,142 \times (35,56\text{cm})^2 \checkmark SF</math><br/> <math>= 3973,1017312\text{cm}^2</math></p> <p>Area = (area of big circle – area of small circle) <math>\div 2</math><br/> <math>\checkmark MCA</math><br/> <math>= (29\,271,2188768 \text{ cm}^2 - 3973,1017312\text{cm}^2) \div 2 \checkmark MA</math><br/> <math>= 12\,649,06 \text{ cm}^2</math></p> <p>Convert to <math>\text{m}^2 = 12\,649,06 \div 100^2 \checkmark C</math><br/> <math>= 1,26 \checkmark CA</math></p> <p>Claim is <b>INCORRECT</b> <math>\checkmark O</math></p> <p><b>OR</b></p> <p>Radius of Big Circle = <math>38'' \times 2,54 \checkmark C</math><br/> <math>= 96,52 \text{ cm} \div 100 \checkmark C</math><br/> <math>= 0,9652\text{m}</math></p> <p>Radius of small circle = <math>14'' \times 2,54</math><br/> <math>= 35,56 \text{ cm} \div 100</math><br/> <math>= 0,3556\text{m}</math></p> <p><b>Area = area of big circle – area of small circle</b></p> <p>Area of big circle = <math>3,142 \times (0,9652\text{m})^2 \checkmark SF</math><br/> <math>= 2,9271218877 \text{ m}^2</math></p> <p>Area of small circle = <math>3,142 \times (0,3556\text{m})^2 \checkmark SF</math><br/> <math>= 0,3973101731\text{m}^2</math></p> | <p><b>CA from Q4.1.1</b></p> <p>1C Conversion</p> <p>1SF substitution</p> <p>1SF substitution</p> <p>1MCA for subtracting<br/>1MA for dividing by 2</p> <p>1C for conversion<br/>1CA answer<br/>1O Opinion</p> <p><b>OR</b></p> <p>1C Conversion<br/>1C Conversion</p> <p>1SF Substitution</p> <p>1SF substitution</p> | <p>M<br/>L4<br/>D</p> |
|-------|--|--|-----------------------|

|              |  |  |                             |
|--------------|--|--|-----------------------------|
|              | <p>Area = (area of big circle – area of small circle) ÷ 2</p> <p style="text-align: center;">✓MCA</p> <p style="text-align: center;">= (2,9271218877 m<sup>2</sup> - 0,3973101731m<sup>2</sup>) ÷ 2 ✓MA</p> <p style="text-align: center;">= 1,26 ✓CA</p> <p>Claim is <b>INCORRECT</b> ✓O</p>  | <p>1MCA subtracting</p> <p>1MA dividing by 2</p><br><p>1CA answer</p> <p>1O Opinion</p> <p style="text-align: right;">(8)</p>  |                             |
| <p>4.2.1</p> | <p>Number of litres = 32 × 0,03</p> <p style="text-align: center;">= 0,96ℓ ✓A</p> <p>Convert to cm<sup>3</sup> = 0,96 × 1000 ✓MA</p> <p style="text-align: center;">= 960 cm<sup>3</sup></p> <p>960cm<sup>3</sup> = 3.142 × r<sup>2</sup> × 19 ✓SF</p> <p>960 cm<sup>3</sup> ÷ (3,142 × 19 cm) = r<sup>2</sup> ✓MA</p> <p><math>\sqrt{16,08}</math> = r<sup>2</sup> ✓MCA</p> <p>4,01 cm = r ✓CA</p> <p>Diameter = 4,01cm × 2 ✓MCA</p> <p style="text-align: center;">= 8,02cm ✓CA</p>  | <p>1A for correct litres</p> <p>1MA multiplying by 1000</p> <p>1SF correct substitution</p> <p>1MA changing subject of the formula</p> <p>1MCA square root</p> <p>1CA answer</p> <p>1MCA multiply by 2</p> <p>1CA answer</p> <p style="text-align: right;">(8)</p> | <p>M</p> <p>L3</p> <p>D</p> |
| <p>4.2.2</p> | <p>Width = 8,02cm + 2cm ✓MCA</p> <p style="text-align: center;">= 10,02cm ✓CA</p> <p>Height = 19cm + 3cm + 2cm ✓MCA</p> <p style="text-align: center;">= 24cm ✓CA</p>   | <p><b>CA Q4.2.1</b></p> <p>1MCA adding 2</p> <p>1CA answer</p> <p>1MCA adding 5cm</p> <p>1CA answer</p> <p style="text-align: right;">(4)</p>  | <p>M</p> <p>L2</p> <p>E</p> |
| <p>4.2.3</p> | <p>Surface Area Rectangular Prism =</p> <p style="text-align: center;">✓SF</p> <p>2(10,02cm × 10,02cm) + 2(10,02cm × 24cm) + 2(10,02cm × 24cm) ✓SF</p> <p style="text-align: center;">= 1162,72 cm<sup>2</sup> ✓CA</p> <p>Convert to m<sup>2</sup> = 1162,72 cm<sup>2</sup> ÷ 100<sup>2</sup> ✓C</p> <p style="text-align: center;">= 0,12m<sup>2</sup> ✓CA</p>  | <p><b>CA from Q4.2.2</b></p> <p>1SF correct substitution</p> <p>1SF substitution</p> <p>1CA answer</p> <p>1C dividing by 10 000</p> <p>1CA answer</p> <p style="text-align: right;">(5)</p>  | <p>M</p> <p>L3</p> <p>M</p> |
| <b>[31]</b>  |  |  |                             |

| QUESTION 5 [31 MARKS] |   |  |  |
|-----------------------|---|--|--|
| Quest.                | Solution  | Explanation  | T & L  |
| 5.1.1                 | <p>6335miles:10 228km ✓ RT<br/>                     ✓ R<br/>                     0,619: 1 ✓ S</p> <p style="text-align: center;"><b>OR</b></p> <p>6335miles:10 228km ✓ RT<br/>                     ✓ R<br/>                     1: 1,615 ✓ S</p>  | <p>1RT for both correct values<br/>                     1S simplifying<br/>                     1R Rounding</p> <p style="text-align: center;"><b>OR</b></p> <p>1RT for both correct values<br/>                     1S simplifying<br/>                     1R Rounding</p> <p style="text-align: right;">(3)</p>   | <p>MP<br/>                     L1<br/>                     D</p> |
| 5.1.2                 | 9 countries ✓✓ RT   | <p>2RT correct answer</p> <p style="text-align: right;">(2)</p>  | <p>MP<br/>                     L1<br/>                     E</p> |
| 5.1.3                 | Bar/Line/Linear/graphic scale ✓✓ A  | <p>2A correct answer</p> <p style="text-align: right;">(2)</p>   | <p>MP<br/>                     L1<br/>                     E</p> |
| 5.1.4                 | <p>Scale 4,4 cm = 1000 km ✓ A</p> <p>Distance on map = 17,2 cm ✓ A</p> <p style="text-align: center;">✓MA ✓MCA</p> <p>Actual Distance: = (17,2 cm × 1000) ÷ 4,4</p> <p style="text-align: center;">= 3 909,09km ✓ CA</p> <p style="text-align: center;"><b>OR</b></p> <p>Scale 44 mm = 1000 km ✓ A</p> <p>Distance on map = 172 mm ✓ A</p> <p style="text-align: center;">✓MA ✓MCA</p> <p>Actual Distance: = (172 mm × 1 000) ÷ 44</p> <p style="text-align: center;">= 3 909,09km ✓ CA</p> | <p>1A measuring scale</p> <p>1A measuring distance</p> <p>1MA multiplying by 1000</p> <p>1MCA dividing by 4,4</p> <p>1CA answer</p> <p style="text-align: center;"><b>OR</b></p> <p>1A measuring scale</p> <p>1A measuring distance</p> <p>1MA multiplying by 1000</p> <p>1MCA dividing by 44</p> <p>1CA answer</p> <p><b>Accept leeway of 1mm or 0,1 cm</b></p> <p style="text-align: center;"><b>NPR</b></p> <p style="text-align: right;">(5)</p> | <p>MP<br/>                     L3<br/>                     M</p> |
| 5.1.5                 | The distance measured on the map is an approximation or straight-line measurement while the real road distance is longer due to bends, detours and route variations. ✓✓ O   | <p>2O correct explanation</p> <p style="text-align: right;">(2)</p>  | <p>MP<br/>                     L4<br/>                     E</p> |

|       |   |   |               |
|-------|---|---|---------------|
| 5.1.6 | <p>Time = <math>10\,228 \text{ km} \div 90 \text{ km/hour} \checkmark \text{MA}</math><br/> <math>= 113,64 \text{ hours} \checkmark \text{A}</math><br/>           Time in days = <math>113,64 \div 12 \checkmark \text{MCA}</math><br/> <math>= 9,47 \text{ days} \checkmark \text{CA}</math><br/> <math>= 10 \checkmark \text{R}</math></p>  | <p>1MA dividing by 90<br/>           1A correct answer<br/>           1MCA dividing by 12<br/>           1CA answer<br/>           1R rounding<br/>           (5)</p> | MP<br>L3<br>M |
| 5.1.7 | <p><math>^{\circ}\text{C} = \frac{5}{9} (98^{\circ}\text{F} - 32) \checkmark \text{SF}</math><br/> <math>= 36,67^{\circ}\text{C} \checkmark \text{A}</math><br/> <math>= 37^{\circ}\text{C} \checkmark \text{R}</math></p>    | <p>1SF substitution<br/>           1A correct answer<br/>           1R rounding<br/>           (3)</p>  | MP<br>L2<br>M |
| 5.2.1 | <p><math>\checkmark \text{C}</math><br/> <math>64\,000\,000 : 101\,478\,000 \checkmark \text{A}</math><br/> <math>\checkmark \text{S}</math><br/> <math>1:1,58559375</math></p>   | <p>1C conversion<br/>           1A correct values and order<br/>           1S Simplification<br/> <b>NPR</b><br/>           (3)</p>                                   | MP<br>L2<br>M |
| 5.2.2 | <p><math>\checkmark \text{RT}</math><br/>           Number of people per <math>\text{km}^2 = 101\,478\,000 \div 1\,010\,408 \checkmark \text{MA}</math><br/> <math>= 100,4326965</math><br/> <math>= 100 \checkmark \text{A}</math></p>   | <p>1RT correct value<br/>           1MA dividing by 1 010 408<br/>           1A correct answer<br/>           (3)</p>   | MP<br>L2<br>M |
| 5.2.3 | <p><math>\checkmark \text{MA}</math><br/>           Number of times bigger = <math>1\,221\,037 \text{ km} \div 1\,010\,408 \checkmark \text{RT}</math><br/> <math>= 1,208</math><br/>           The claim is <b>CORRECT</b> <math>\checkmark \text{O}</math></p>    | <p>1MA dividing<br/>           1RT correct value<br/>           1O Opinion<br/>           (3)</p>   | MP<br>L4<br>M |
|       |   | [31]  |               |

**TOTAL MARKS: 150**