



## **education**

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**NORTH WEST PROVINCE**

### **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**MATHEMATICAL LITERACY P2**

**SEPTEMBER 2021**

**MARKS: 150**

**TIME: 3 hours**

**This question paper consists of 11 pages and an addendum with 3 annexures.**

## INSTRUCTIONS AND INFORMATION

1. This paper consists of FOUR 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 2.1  
ANNEXURE C for QUESTION 4.3
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), except if 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. Maps and diagrams are NOT drawn according to scale, unless stated otherwise.
10. Write neatly and legibly.

**QUESTION 1**

1.1

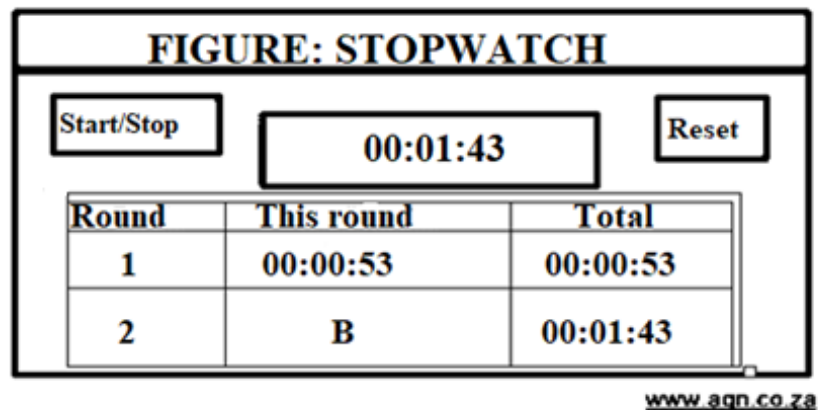
A floor plan for offices is given on **ANNEXURE A** with the electrical plan attached to it. The length of the building on the plan is 11,7 cm and the width is 10,4 cm.

Use **ANNEXURE A** to answer the questions that follow.

- 1.1.1 Explain the meaning of the term *floor plan*. (2)
- 1.1.2 Identify the item from the electric plan that is used to turn the light on and off. (2)
- 1.1.3 Calculate the difference between the length and the width of the building on the floor plan. (3)
- 1.1.4 Identify the item from the electric plan that is responsible for alerting people when there is fire in the building. (2)
- 1.1.5 Name the type of scale used on the floor plan. (2)

1.2

Wade van Niekerk runs an 800 m which is a complete 2 round race during athletics. His time for the race is shown on the stopwatch in the figure below.



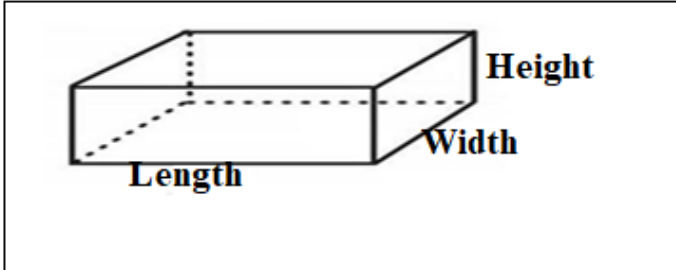
Use the figure above to answer the questions that follow.

- 1.2.1 Determine the distance ran in the first round. (2)
- 1.2.2 Write down the time taken by Wade van Niekerk to complete the 800 m. (2)
- 1.2.3 Write down the total time rounded off to the nearest minute. (2)

1.3

As part of a community project, cosmetics are packaged in shoe boxes and dropped off at old age homes.

ITEMS IN A SHOE-BOX			
Toothpaste	Roll-on	Bar of soap	Body cream
Toothbrush	Dettol	Face cloth	Box tissues

DIAGRAM OF A SHOE BOX	DIMENSIONS
	Length: 340 mm Width: 200 mm Height: 11 cm

[Source: [www.santashoebox.org.za](http://www.santashoebox.org.za)]

Use the information above to answer the questions that follow.

1.3.1. Determine the number of items placed in the shoe box. (2)

1.3.2. Name the shape of the base of the box. (2)

1.3.3. Choose the correct formula to calculate the area of the base of the box:  
 a)  $A = l \times w$   
 b)  $A = \pi r^2$   
 c)  $A = 2\pi r^2 + 2\pi r h$  (2)

1.3.4. Determine the length (in centimetres) of the shoe box. (3)

1.4

The elderly people use a 300 ml jug, as seen in the picture below to fill up their 3-litre kettle.



Use the information above to answer the questions that follow.

1.4.1 Write down the volume of a jug. (2)

1.4.2 Convert the 3 litres to millilitres. (2)

[30]

**QUESTION 2**

2.1

The Wimbledon tennis championships are held in London annually. A ground plan of Wimbledon is shown in **ANNEXURE B**.

**TABLE 2: SOME INTERESTING FACTS ABOUT WIMBLEDON**

Grounds (size)	13,5 acres
Car Park area	42 acres
Grounds (capacity)	39 000 spectators on the grounds at any time
Centre Court (main court)	14 979 seats Maximum spectators: 15 000
No. 1 Court	11 393 spectators
Staff size	6 000
Large TV screen (size)	40 square meters

[Source: [www.wimbledon.com/en\\_GB/atoz/faq](http://www.wimbledon.com/en_GB/atoz/faq) and facts and figures]

Use **TABLE 2** and **ANNEXURE B** to answer the questions that follow.

2.1.1 Determine the number of staff members at Wimbledon. (2)

2.1.2 Calculate the density (to the nearest whole) of spectators on the Wimbledon grounds.

You may use the following formula:

$$\text{Density of spectators on the ground} = \frac{\text{Number of spectators}}{\text{ground size (in acres)}} \quad (4)$$

2.1.3 Express the ratio of the large TV screen size to the car park area in the form **1: ...**, if 1 acre = 4046,86 m<sup>2</sup>. (4)

2.1.4 Name the **THREE** roads that appear on the map. (3)

2.1.5 Write down the number of parking areas displayed on the map. (2)

2.1.6 Give **ONE** possible reason why practice courts are available for the players. (2)

2.1.7 One of the players' claims that the number of spectators in court No. 1 is 30% of the number of spectators on the ground.

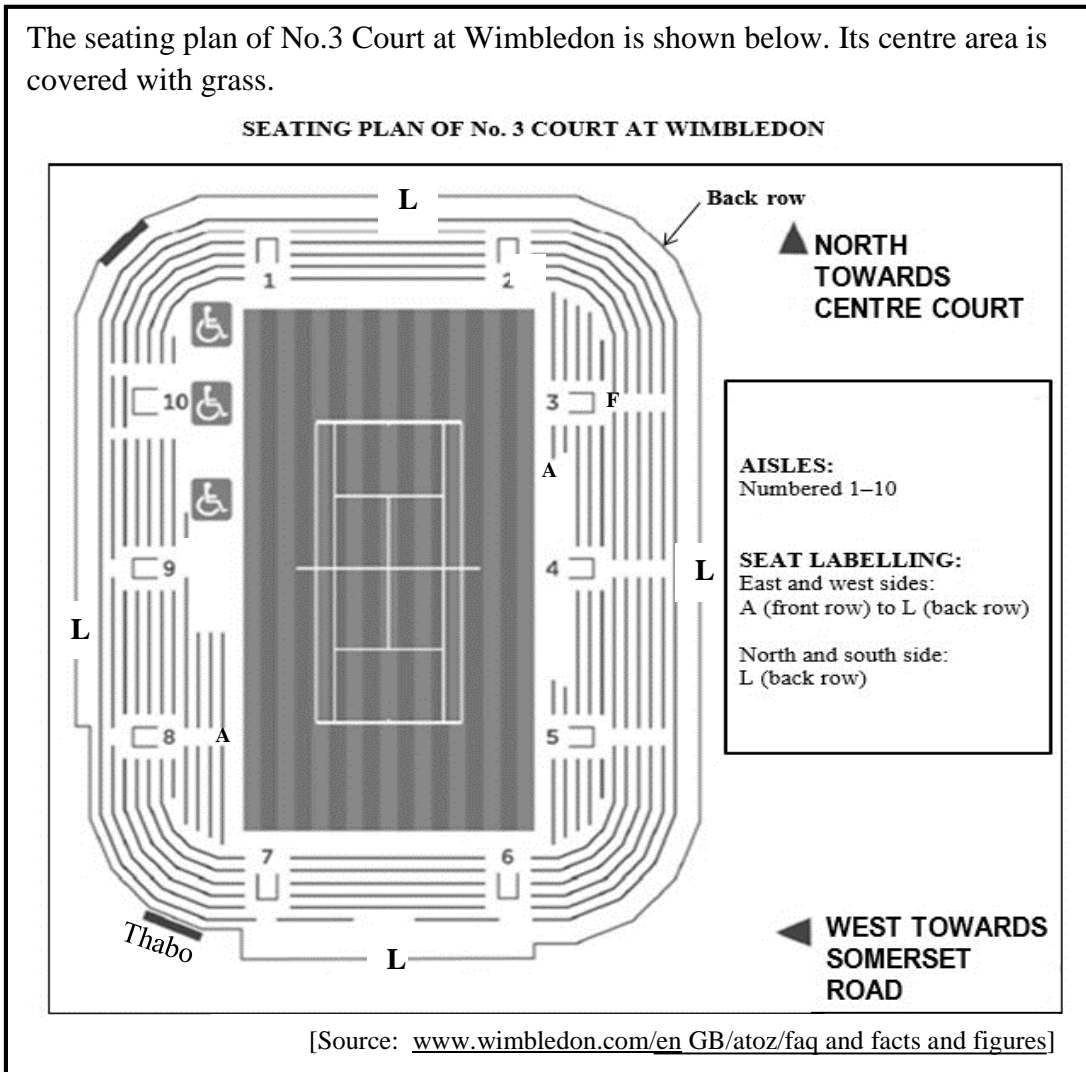
Verify, with calculations, whether this claim is valid. (4)

2.1.8 Identify the nearest gate to the information desk and explain why the information desk is placed nearer to the gates. (4)

2.1.9 Give **TWO** general directions in which a tennis player can use to drive on Somerset Road to Aorangi Park from No. 3 Court. (3)

2.2

The seating plan of No.3 Court at Wimbledon is shown below. Its centre area is covered with grass.



Use the information above to answer the questions that follow.

- 2.2.1 Determine the number of aisles. (2)
- 2.2.2 Identify the aisles that would be closest to Thabo who is seated in the south-westerly corner of the court. (4)
- 2.2.3 Describe the route Thabo will take to move from where he is seated to occupy a seat just before aisle 5. (4)
- 2.2.4 Write down the letter for the front row on the north side of aisle 3. (2)
- 2.2.5 Determine, as a percentage, the probability of seating on an odd numbered aisle. (3)

[40]

**QUESTION 3**

3.1

Covid-19 virus led to social distancing which required that learners be seated ONE metre apart in schools from the year 2020.

Below is a school hall with chairs and tables used during the NSC 2020 exams.

**NOTE:**

Details	Dimensions
School hall ceiling	25 m × 18 m
Single table board	750 mm × 450 mm
162 learners will be seated in the hall	
1 litre of paint covers a surface area of 13 m <sup>2</sup>	
<b>Area of rectangle = length × width</b>	
<b>Perimeter of rectangle = 2(length + width)</b>	

Use the information above to answer the questions that follow.

- 3.1.1 There are measures to prevent the spread of Covid-19. Name any TWO, except social distancing. (4)
- 3.1.2 Calculate the number of teachers needed to invigilate in the hall, if the ratio of teacher to learner is 1:30. (3)
- 3.1.3 Calculate the area (in m<sup>2</sup>) for the single table boards in the school hall. (5)
- 3.1.4 Determine the perimeter for the ceiling of the school hall. (2)
- 3.1.5 Verify, showing ALL calculations, whether 5 litre of paint will be enough to cover a total surface area of 85 m<sup>2</sup>. (3)
- 3.1.6 One of the learners weighed 65 kg and his height was 1,65 m.

Calculate his body mass index (BMI), rounded off to the nearest kg/m<sup>2</sup>.


You may use the following formula: 
$$\text{BMI} = \frac{\text{weight (in kg)}}{(\text{height in m})^2}$$
 (3)

3.2

The principal must buy sanitizers for 40 staff members (including School Management Team (SMT) and Principal) and 985 learners at his school. Each learner uses 2 tablespoons, and the staff members use four times the amount per day.

Below is a price list for sanitizers.

**TABLE 2: PRICE LIST OF SANITIZERS**

NORIANA Supermarket	
	
PINK PILLETJIES	
ℓ: R180	250 ml: R 47,99
5 ℓ: R499	500 ml: R 95
25 ℓ: R1 905	750 ml: R130

**NOTE:** 1 tablespoon = 15 ml

[Source: *Pink pilletjies cleaning products brochure*]

Use the information above to answer the questions that follow.

3.2.1 Determine the probability of buying ONE 100 litre sanitizer bottle from Noriana supermarket. (2)

3.2.2 Explain why it is important for the school to buy from the local supermarket. (2)

3.2.3 Show that staff members will use ONE bottle of 25 litre sanitizer in a week. Write down the amount to be paid by the school for the sanitizer.

Assume: 1 week = 5 days (7)

3.2.4 Schools are offered 23% discount when buying three containers of 25 ℓ sanitizers.

Calculate the discount amount for the three containers. (4)

[35]

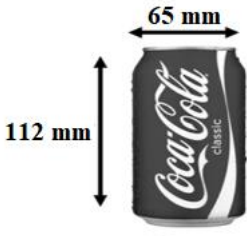
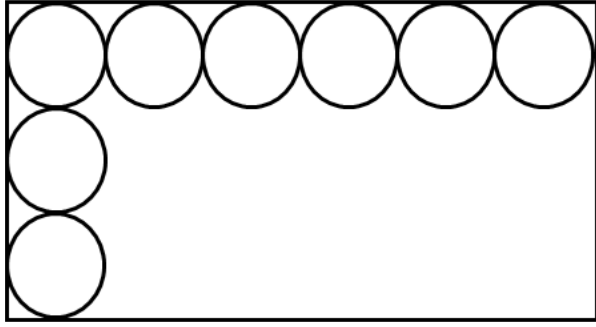


**QUESTION 4**

4.1

After each tennis match, the organizers of the Wimbledon championship give the players a can of cool drink.

Coca Cola cans are packed in a rectangular box in such a way that their circular tops touch each other as shown below.

CAN OF COKE	ILLUSTRATION OF CANS IN A BOX
	

The following formulae may be used:

- **Area of circle** =  $\pi r^2$
- **Volume (cylinder)** =  $\pi r^2 h$ , where  $\pi = 3,142$
- **Volume of box** = **length** × **width** × **height**

**NOTE:**

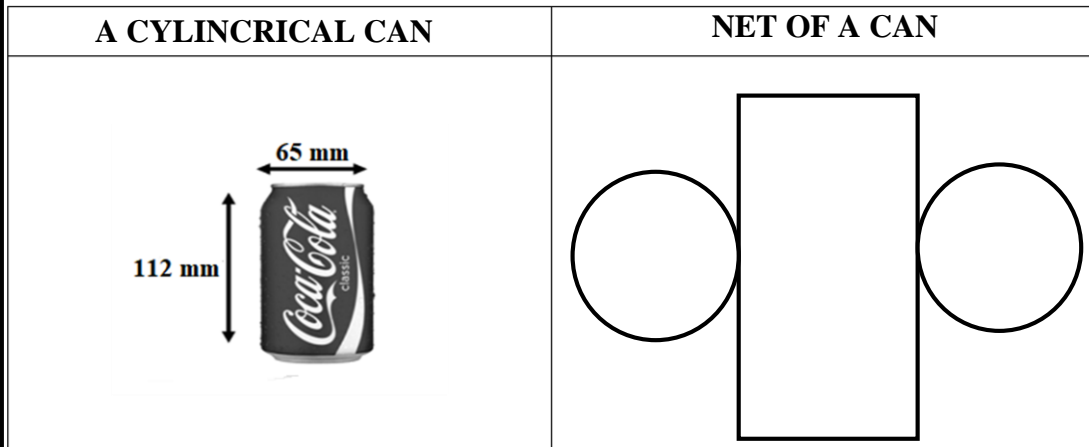
- Dimensions of a box are length, width, and height.
- The height of the box = 11,76 cm.
- $1000 \text{ cm}^3 = 1 \text{ litre}$

Use the information above to answer the questions that follow.

- 4.1.1 Calculate the area (to the nearest  $\text{cm}^2$ ) of the circular top of ONE can in a box. (5)
- 4.1.2 Determine the dimensions (in cm) of the base of the box. (5)
- 4.1.3 Calculate the volume (in litres) of the box, rounded off to one decimal place. (4)
- 4.1.4 Determine the number of cans that will fit on the first layer of the box. (2)
- 4.1.5 Anati claimed that the volume of the unused space in the box is 2,2 litres. Verify, showing ALL calculations, whether her claim is CORRECT. (7)

4.2

The cylindrical can is made from Alumina (aluminium and trace amounts of other metals) material that cost R22,50 (**including VAT**) per dozen of cans.



The following formula may be used:

$$\text{Surface area (cylinder)} = 2\pi r (r + h), \text{ where } \pi = 3,142$$

Use the information above to answer the questions that follow.

4.2.1 Calculate the total surface area of the can. (4)

4.2.2 Calculate the cost, excluding VAT, of the Alumina material needed for a dozen of cans. (2)

4.3

Peter stays at Durban North-Umhlanga Rocks and uses route number 716 bus on Mondays to Fridays when he goes to work, at the market. ANNEXURE C shows the bus timetable.

Use ANNEXURE C and answer the questions that follow.

4.3.1 On a specific day, the bus travelled 27 km from the market to Durban North-Umhlanga Rocks in 0,4 hours. Calculate the average speed of the bus.

You may use the formula:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \quad (2)$$

4.3.2 Give ONE possible reason why the same bus is travelling to both the city and the market on weekends. (2)

4.3.3 Peter knocks off at 5 pm and then walks 10 minutes to catch the 716 bus. Identify the time of departure for the next 716 bus if the knock off time is extended by 45 minutes. Show ALL calculations (3)

4.3.4 Determine the probability of travelling from the market to Durban North-Umhlanga Rocks during the week. (2)

4.3.5 Calculate the temperature (in °F) at the market if it was 26°C. Round your answer to the nearest 10 degrees.

You may use the formula.

$$^{\circ}\text{F} = (1,8 \times ^{\circ}\text{C}) + 32^{\circ} \quad (4)$$

**[42]**

**TOTAL: 150**