Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2022

MATHEMATICAL LITERACY P2

MARKS: **100**

TIME: **2 hours**

This question paper consists of 11 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Number the answers correctly according to the numbering system used in this question paper.
3. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
4. Show ALL calculations clearly.
5. Maps and diagrams are NOT drawn to scale, unless otherwise stated.
6. Indicate units of measurement, where applicable.
7. Round off ALL final answers appropriately accordingly to the given context, unless stated otherwise.
8. Start EACH question on a NEW page.
9. Write neatly and legibly.

QUESTION 1

1.1 The table below shows the relationship between hours and the rate of charged per hour or part thereof. Tariffs include value added tax (VAT). Refer to the table and answer the questions that follow.

TABLE 1: PARKING FEES FOR THIS AREA

HOURS	RATE CHARGED PER HOUR OR PART THEREOF:
0–2	R5,00
2–3	R7,00
3–4	R10,00
4–5	R12,00
5–6	R15,00
6–8	R20,00
More than 8 hours	R40,00

NOTE: Lost ticket penalty is R50,00 plus additional charges.

1.1.1 What is the rate charged if Mr Sokutu parked his car for 8 hours 15 minutes? (2)

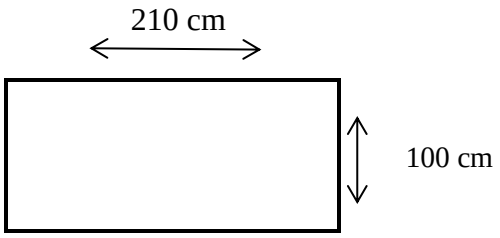
1.1.2 Write 8 hours and 15 minutes in hours. (2)

1.2 Mr Titi lost his ticket. When looking at the security cameras, they could see that he arrived at the mall at 11:30 am and that it was now 14:20 pm.

1.2.1 Determine how much time lapsed. (2)

1.2.2 Calculate how much Mr Titi was charged. (2)

1.3 Refer to the rectangular diagram below and answer the questions that follow.



Scale 1 : 100

1.3.1 Define the term *perimeter*. (2)

1.3.2 Determine the perimeter of the rectangular diagram in centimetres. (2)

1.3.3 Give the name of the scale found on the diagram. (2)

1.3.4 Explain what scale 1 : 100 means. (2)

1.4 1.4.1 Identify from the list below a provincial road in South Africa.

They are as follows:

N10
R44
M75 (2)

1.4.2 Define the term *provincial road* in the above context. (2)
[20]

QUESTION 2

2.1 The *tylosaurus proriger* was an ancient sea animal that is thought to have lived 85 million years ago. The top speed of the tylosaurus is about 64 km/h. This animal weighed 20 tons.

[Source: https: // kids.national geographic.com]

Refer to the diagram below. Use the scale to calculate the length of the animal below.

1, 9 meters

2.1.1 Write down the name of the scale used above. (2)

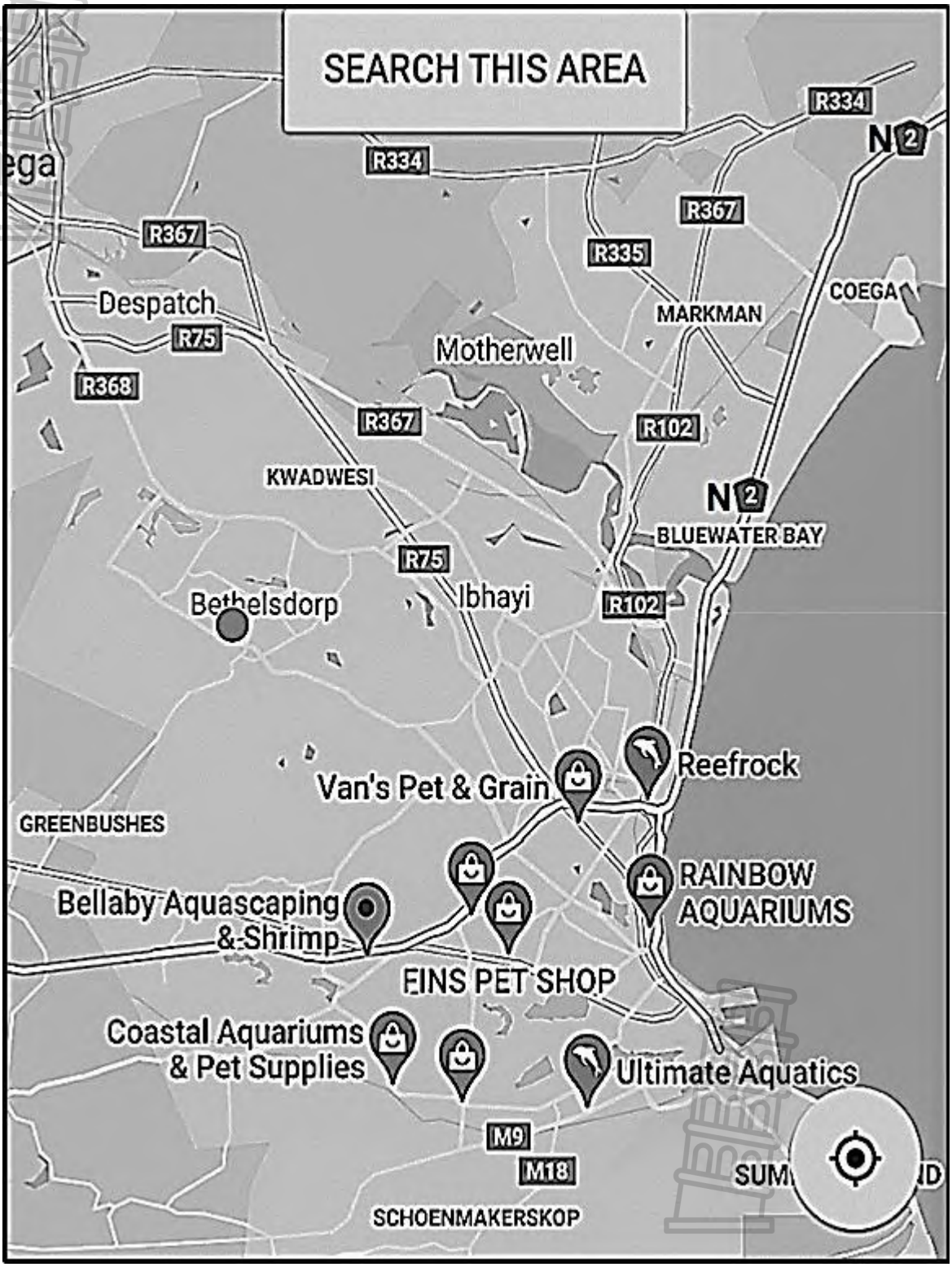
2.1.2 Use the scale to calculate the actual length of the animal in metres. (5)

2.1.3 This animal weighed 20 tons. Convert 20 tons to kilograms. (2)

2.2 Due to the global fish crisis only 30 000 tons of tuna may be caught annually. The true quantity of tuna that is caught, is closer to 48 000 tons per year.

Calculate the percentage of illegal fishing in one year. (3)

2.3 Refer to the map below and answer the questions that follow.



2.3.1 Name the metropolitan roads found on the map. (2)

2.3.2 List the major national road that links Bluewater Bay to Coega. (2)

2.3.2 Identify the provincial road between Ibhayi and Despatch. (2)

2.3.4 How many provincial roads are indicated on the map? (2)

2.3.5 Mr Thulani stated that the measured distance on the map from Motherwell to Bluewater Bay is 5 cm, and the actual distance is 13 km. He further said that the scale of the map is 1 : 260 000.

Verify, with the necessary calculations, if his statements are valid. (6)

2.3.6 Determine the time (in minutes and seconds) taken by the Thulani family to travel from Motherwell to Bluewater Bay, if they travelled by car at an average speed of 80 km/h for a total distance of 13 km.

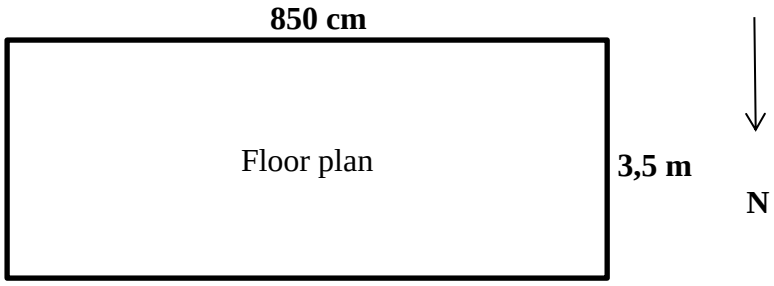
Use the formula:

$$\textbf{Time} = \frac{\textbf{Distance}}{\textbf{Average Speed}}$$

(4)
[30]

QUESTION 3

3.1 The diagram below shows the floor plan of the living room of the Sokutu family's house.



Study the information below and answer the questions that follow.

Living room dimensions	
Length	= 850 cm
Breadth	= 3,5 m
Height	= 10 cm

3.1.1 Calculate the perimeter of the living room in mm. Use the formula below:

Perimeter of rectangle = 2 × (length + breadth) (3)

3.1.2 Calculate the area of the floor in m^2. Use the formula below:

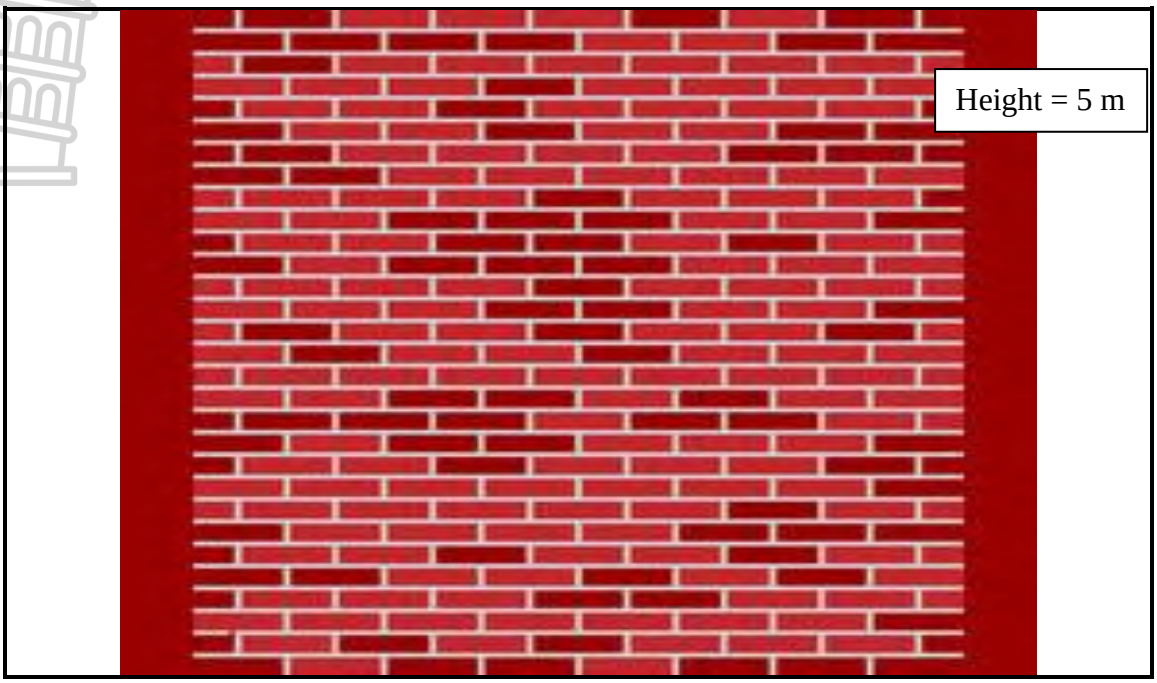
Area of rectangle = Length × Breadth (3)

3.1.3 If a concrete floor which is 10 cm thick, is to be laid, how many cubic metres of concrete will be needed? You may use the formula:

Volume = Length × Breadth × Height (2)

3.1.4 In which directions does the width of the living room walls face? (2)

3.2 This diagram below represents a picture of the southern wall of the Sokutu family's living room. They carefully selected red bricks for the wall. This diagram is not drawn to scale. The following information indicated on the diagram below is useful for calculation.



[Adapted from vectorstock.com/red-brick wall/]

Southern wall dimensions:
Length = 850 cm
Height = 5 m
Dimensions of ONE brick: height = 73 mm length = 222 mm width = 106 mm
Area of ONE Brick = length × height
NOTE: Mortar is a workable paste which hardens to bind building blocks such as bricks.

3.2.1 Determine the number of bricks needed for the southern wall shown in diagram above.
NOTE: The dimensions of ONE brick exclude the mortar which is 10 mm.

You may use the following formula:

$$\textbf{No. of bricks} = \frac{\textbf{Area of the wall in } m^2}{\textbf{Area of ONE brick in } m^2}$$ (9)

3.2.2 The builder suggested that an additional 10% bricks should be ordered to cover for the wastage. Calculate the total number of bricks needed for the boundary wall. (2)

3.2.3 The price of one brick is R4,75, VAT included. Calculate the total amount to be spend on bricks. (Use your answer in QUESTION 3.2.2.) (2)
[23]

QUESTION 4

4.1 Jonah Mouwer buys a small fish tank from Bay Aquariums for the price of R472,00 (VAT inclusive). He wants to present the dimensions of his fish tank on a piece of paper. His father, an architect by profession, told him to use a scale of 1 : 30.

This table below shows the dimensions of a small fish tank. Study the table and answer the questions that follow.

TABLE 2: MEASUREMENTS OF THE FISH TANK

DIMENSIONS OF THE SMALL FISH TANK IN METRES	DIMENSIONS ON A PIECE OF PAPER IN CM
Height = 0,45 m	**A**
Length = 1,05 m	**B**
Width = 0,3 m	Width = 1 cm

NOTE: Volume = length × width × height

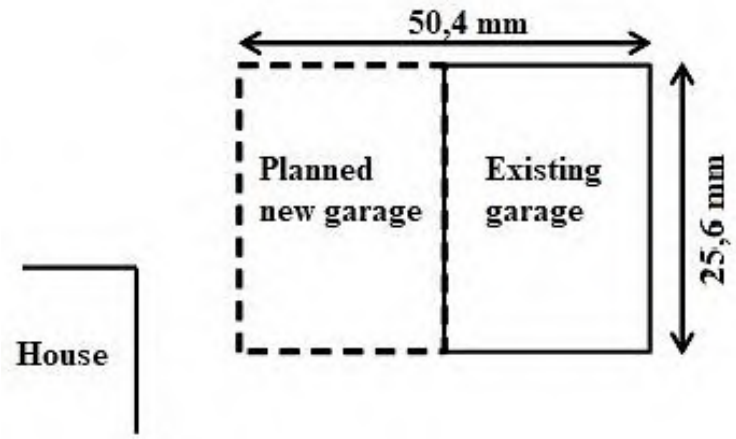
4.1.1 Refer to the table above. Use the scale to calculate the missing value **A** and **B**. (5)

4.1.2 Determine the volume of the small fish tank in cm^3. (3)

4.1.3 How many litres of water will the tank hold when it is 90% full?

You may use: **1 cm^3 = 1 mℓ** (3)

4.2 The winner was selected randomly. Mr Sokutu won the grand prize of R150 000. He submitted 1 000 entries out of a total of 10 000 entries for the competition. He further decided to use R90 000 from the R150 000 to extend his single garage into a double garage. He had a draughtsman draw up the plan. The plan is drawn below.



Scale 1 : 150

NOTE: Refer to the diagram above and use the scale.

4.2.1 Calculate the actual length and breadth of the existing and planned new garage in metres using the given scale. (6)

Given: Measure length = 50,4 mm
Measure width = 25,6 mm

4.2.2 Calculate the floor space he will now have available in his new double garage. Give your answer to the nearest square metres.
You may use the formula:

Area of Rectangle = Length × Breadth (3)

4.3 Determine the probability of Mr Sokutu not winning the competition, taking into account the number of entries he submitted. Give your answer in percentage format. (3)

4.3.1 What is the probability of Mr Sokutu winning the competition? Choose from the table below.

Impossible	Unlikely	Even Chance	Likely	Certain

(2)

4.3.2 Write 10% to 90% in simplified ratio format. (2)

[27]

TOTAL: 100

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MATHEMATICAL LITERACY P2 MARKING GUIDELINE

MARKS: 100

Symbol	Explanation
M	Method
M/A	Method with accuracy
MCA	Method with consistent accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table OR Reading from a graph OR Read from a map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding off OR Reason
AO	Answer only
NPR	No penalty for rounding

This marking guideline consists of 8 pages.

QUESTION 1 [20]

Ques.		Solution	Explanation	Topic & Level
1.1	1.1.1	R40,00 ✓✓ RT	2RT correct value (2)	F L1
	1.1.2	Hours: 8 ✓ C Convert 15 min = 15 ÷ 60 = 0,25 + 8 = 8,25 hrs. ✓ A	1C divide by 60 1A adding correct values (2)	M L1
1.2	1.2.1	Departure 14h20 Arrive − 11h30 ✓ MA Lapse time = 2h50 min ✓ A	1MA subtraction time 1A simplified time (2)	M L1
	1.2.2	Cost = R50,00 + (R7,00 x R3,00) ✓RT = R50,00 + R21,00 R71,00 ✓ A	1RT correct values 1A answer (2)	F L1
1.3	1.3.1	It is the total length of the sides in a shape. ✓✓ **OR** It is the distance around the outside of the shape. ✓✓ R **Accept any other relevant reason.**	2R Explanation (2)	M L1
	1.3.2	✓ MA Perimeter rectangular diagram = 210 + 210 + 100 + 100 = 620 cm ✓ CA	1MA adding sides 1CA answer (2)	M L1
	1.3.3	Numerical scale or Ratio scale ✓✓ A	2A concept scale (2)	M&P L1
	1.3.4	Every 1 unit on the map represents 100 units in reality. ✓✓ A	2A Explanation (2)	M&P L1
1.4	1.4.1	R44 ✓✓ A	2A correct road (2)	M&P L1
	1.4.2	Provincial roads serve as feeders to the national roads. ✓✓ A **OR** Provincial roads also serve as trunk roads in areas where there is no national roads. ✓✓ A **Accept any relevant explanation.**	2A Explanation (2)	M&P L1
			[20]	

QUESTION 2 [30]

Ques.		Solution	Explanation	Topic & Level
2.1	2.1.1	Bar scale ✓✓ 2A	2A correct scale (2)	M&P L1
	2.1.2	Width of bar (measured) = 2,1 cm ✓ A Length of animal = 15,1 cm ✓ A 2,1 cm = 1,9 m ✓ M $\frac{15,1}{2,1} \times 1,9$ m = 13,6619 m ✓ CA = 13,7 m ✓ R **OR** ✓A 2,1 cm = 1,9 m ✓ A ✓ M 15,1 cm = $\frac{15,1 \text{ cm} \times 1,9 \text{ m}}{2,1 \text{ cm}}$ = 13,6619 m ✓ CA = 13,7 m ✓ R	1A measured value for bar width 2,1 cm Accept 2 – 2,3 cm 1A measured value diagram for 15,1 cm 1M multiply by 1,9 m 1CA correct value 1R one decimal number 1A measured value for bar width 2,1 cm 1A measured value diagram for 15,1 cm 1M multiply by 1,9 m 1CA correct value 1R one decimal number Mark according to your measured length. (5)	M&P L2
	2.1.3	1 ton = 1 000 kilogram 20 ton = 20 × 1 000 ✓ A = 20 000 kilogram ✓ A	1A × 1 000 1A correct value (2)	M L1
2.2		48 000 – 30 000 = 18 000 ✓ MA ✓ A Percentage illegal fishing = $\frac{18\,000}{30\,000} \times 100$ = 60% ✓ A	1MA Subtracting correct number of tuna 1A × 100 1A correct percentage (3)	F L3

2.3	2.3.1	M9 ✓ RT M18 ✓ RT	2RT correct roads (2)	M&P L1
	2.3.2	N2 ✓ ✓ RT	2 RT (2)	M&P L1
	2.3.3	R75 ✓✓ RT	2 RT (2)	M&P L1
	2.3.4	6 provincial roads ✓✓ 2A **OR** R75; R102; R334; R335; R367; R368 ✓✓ 2A	2A correct number 2A correct list of roads (2)	M&P L2
	2.3.5	Measured distance : 5 cm ✓ A 5 cm : 13 km ✓ M 5 cm : 1300 000 cm ✓ C $\frac{5\ cm}{5\ cm} : \frac{1\ 300\ 000\ \text{cm}}{5\ \text{cm}}$ ✓ S 1 : 260 000 Yes, his statement is valid. ✓ ✓ 2J	1A measured value 1M ratio concept 1C conversion 1S simplify values 2J conclusion (6)	M&P L4
	2.3.6	Time $= \frac{13\ \text{km}}{80\ \text{km/h}}$ ✓ SF = 0,1625 hrs × 60 = 9,75 min ✓ C = 0,75 × 60 = 45 seconds ✓ C Total time = 9 min 45 seconds ✓ S	1SF correct substitution 1C converting hrs to min 1C converting min to seconds 1S simplifying total time (4)	M L2
			[30]	

QUESTION 3 [23]

Ques.		Solution	Explanation	Topic & Level
3.1	3.1.1	Perimeter = 2 (length + breadth) ✓SF = 2 (8 500 mm + 3 500 mm) = 2 (12 000 mm) ✓ = 24 000 mm ✓	1SF correct values 1S simplification 1CA answer (3)	M L2
	3.1.2	Area of floor = Length × Width ✓ C = 8,5 m × 3,5 m ✓ = 29,75 m^2 ✓	1C convert to m 1M multiply 5,8 m with 3,5 m 1CA correct value (3)	M V2
	3.1.3	Volume = length × breadth × height (thickness) = 8,5 m × 3,5 m × 0,1 m ✓ = 2,975 m^3 ✓	2A Reason 1SF substitute correct values 1CA answer for 2,975 m^3 NPR (2)	M L3
	3.1.4	Facing west ✓ and east. ✓	2RT directions (2)	M&P L3

3.2	3.2.1	✓ C Area of southern wall = 8,5 m × 5 m ✓ SF = 42,5 m² ✓ CA Dimensions of 1 brick (with mortar) Length = 222 + 10 ✓ M = 232 mm Height = 73 + 10 = 83 mm Area of 1 brick = length × height = 232 mm × 83 mm ✓ SF = 19 256 mm² ÷ 1 000 000 ✓ C = 0,019 256 m² ✓ CA No. of bricks = $\frac{\text{Area of the wall in m}^2}{\text{Area of one brick in m}^2}$ = $\frac{42{,}5\ \text{m}^2}{0{,}019256\ \text{m}^2}$ ✓ SF = 2 207 ,10 = 2 208 bricks ✓ CA	1C Convert cm to m 1SF correct values 1CA correct value for 42,5 m² 1M adding 10 mm 1SF correct values 1C divide by conversion factor 1CA for 0,019256 m² 1SF correct values 1CA number of bricks (9)	M L3
	3.2.2	10% × 2 208 bricks = 220,8 + 2 208 ✓ M Total amount of bricks ≈ 2 428,8 ≈ 2 429 bricks ✓ CA **OR** 110% × 2 208 = 2 428,8 ✓ S ≈ 2 429 number of bricks ✓ CA	**CA from 3.2.1** 1M adding correct no of bricks 1CA total no of bricks 1S simplifying correct number of bricks 1CA total number of bricks (2)	M L2
	3.2.3	2 429 total number of bricks (answer to QUESTION 3.2.2) R4,75 price of one brick 2 429 x R4,75 ✓ M = R11 537,75 ✓ CA	1CA total number of bricks 1M price of one brick 1CA total amount (2)	M L4
			[23]	

QUESTION 4 [27]				
Ques.		**Solution**	**Explanation**	**Topic& Level**
4.1	4.1.1	Scale 1 : 30 ✓ C A = $\frac{45 \times 1}{30}$ = 1,5 cm ✓ CA ✓ M ✓ M B = $\frac{105 \times 1}{30}$ = 3,5 cm ✓ CA	1C conversion to cm 1M divide by 30 1CA value of 1,5 cm 1M using 105 cm 1CA value of 3,5 cm (5)	M&P L4
	4.1.2	Volume = l × b × h ✓ C = 105 cm × 45 cm × 30 cm ✓ SF = 141 750 cm^3 ✓ CA	1C conversion 1SF substitute correct values 1CA Simplification (3)	M L2
	4.1.3	1 cm^3 = 1 mℓ 141 750 cm^3 = 141 750 mℓ ✓ A 1 litre = 1 000 mℓ ✓ M $\frac{141\ 750\ ml}{1\ 000\ ml}$ = 141,75 litres 0,9 × 141,75 = 127,575 litres ✓ CA	1A ratio concept 1M divide by 1 000 1CA value of 127,575 litres (3)	M L2
4.2	4.2.1	Actual length = 50,4 mm × 150 ✓ M = 7 560 mm ÷ 1 000 ✓ M = 7,56 m ✓ CA Actual width = 25,6 mm × 150 ✓ M = 3 840 mm ÷ 1 000 ✓ M = 3,84 m ✓ CA	1M × 150 1M ÷ 1 000 1CA correct value 1M × 150 1M ÷ 1 000 1CA correct value (6)	M L2
	4.2.2	Area of rectangle = length × breadth = 7,56 m × 3,84 m ✓✓SF M = 29,03 m^2 ✓ CA	1SF correct values 1M multiply values 1CA answer (3)	M L3

	4.3	Probability not winning: $\frac{10\ 000}{10\ 000} - \frac{1000}{10\ 000}$ ✓A $= \frac{9\ 000}{10\ 000} \times 100$ ✓A $= 90\%$ ✓ A	1A numerator 1A denominator 1A for 90% (3)	P L2
	4.3.1	Unlikely ✓✓ A	2A Explanation (2)	P L1
	4.3.2	10% : 90 % ✓ A 1 : 9 ✓ A	1A ratio concept 1A simplified values (2)	P L1
			[27]	
			TOTAL: 100	