KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

MATHEMATICAL LITERACY

GRADE 11

FINAL EXAM 2022

PAPER 2

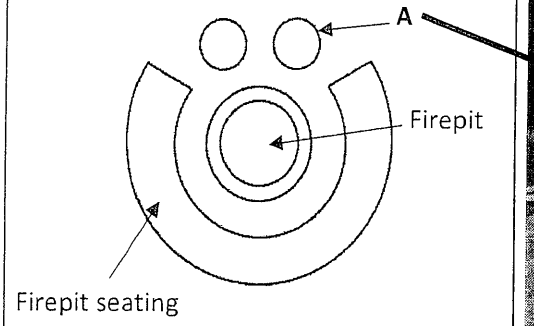
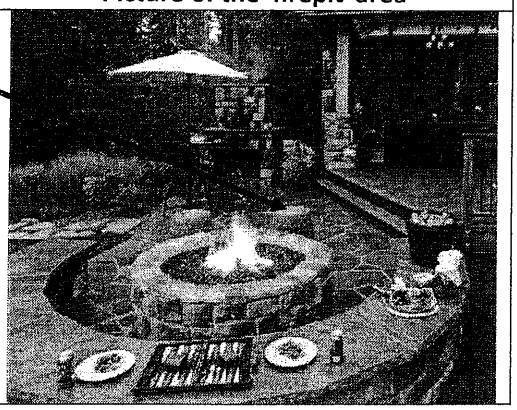
DURATION: 2 HOURS **MARKS: 100**

INSTRUCTIONS & INFORMATION

1. This paper consists of:
   4 QUESTIONS AND 9 PRINTED PAGES (Including this cover page).
2. All calculations and steps must be shown clearly in ink.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Round off **ALL** final answers appropriately according to the given context unless stated otherwise.
5. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
6. Units of measurement must be indicated where applicable.
7. Write neatly and legibly

QUESTION ONE [19 marks]

1.1 The Van Harte family plans to extend their braai area by adding a firepit area.

Diagram of the firepitarea	Picture of the firepit area
	

[Adapted from source: www.renov8sa.cb.za

Use the information above to answer the questions that follow.

1.1.1 Identify the three-dimensional (3D) shape that is indicated by the letter A. (2)

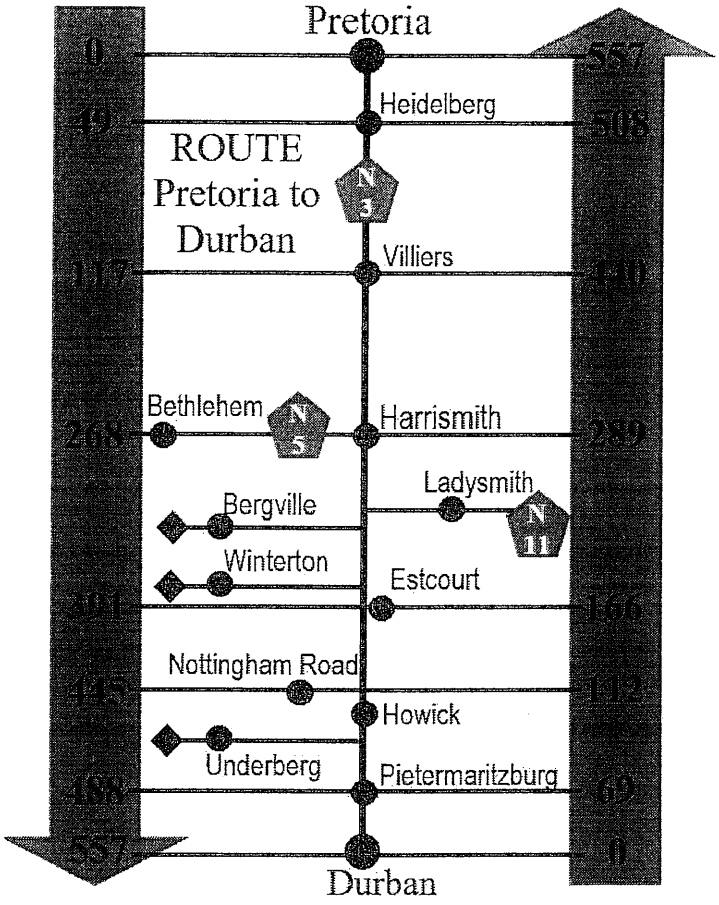
1.1.2 The diameter of the firepit seating is 400 cm. Write down the radius in meters. (3)

1.1.3 The length of the firepit seating is $\frac{3}{4}$ of the circumference of a circle. Determine the length of the firepit seating if the circumference of the full circle is 8,5 meters. (2)

1.1.4 When they built the firepit, they filled it with concrete. Write down the formula from the list below that they will need to use if he wants to determine the amount of concrete needed.
Write only the LETTER of the correct answer in your answer book. (2)

A. Volume = length × breadth × height
B. Volume = side × side × side
C. Volume = $\pi \times \text{radius}^2 \times \text{height}$

1.2 The map below shows the route from Pretoria to Durban and vice versa.
NOTE: Readings on the map are in kilometers (km).



[Adapted from source: learn.mindset.africa]

Use the map above to answer the questions that follow.

1.2.1 Write down the type of map that is displayed above. (2)

1.2.2 Choose the letter A, B or C that does NOT apply to this type of chart. (2)

A. The chart is not drawn to scale.

B. The roads are NOT displayed with straight lines.

C. The actual distances are displayed.

1.2.3 Write down the total distance from Pietermaritzburg to Pretoria. (2)

1.2.4 Write down the National roads to be used to travel from Pretoria to Bethlehem. (2)

1.2.5 A person drives from Bergville towards the N3. Write down whether that person has to turn left or right to drive to Pietermaritzburg. (2)

[19]

QUESTION TWO [25 marks]

2.1 The distance map below shows distances (in km) between some towns in South Africa. Answer the questions based on the distance map below.

									Pretoria
								Port Elizabeth	1120
							Polokwane	1393	273
						Nelspruit	320	1373	342
					Mafikeng	589	585	1122	292
				Kimberley	360	832	805	752	532
			Johannesburg	467	273	358	331	1062	58
		East London	992	750	1029	1214	1323	300	1050
	Durban	667	598	842	859	689	929	927	656
Cape Town	1680	1042	1402	960	1320	1779	1738	756	1463
Bloemfontein	998	667	575	417	175	427	771	748	635	475

Distances given are by the best and most practical routes from centre to centre, and not necessarily the shortest

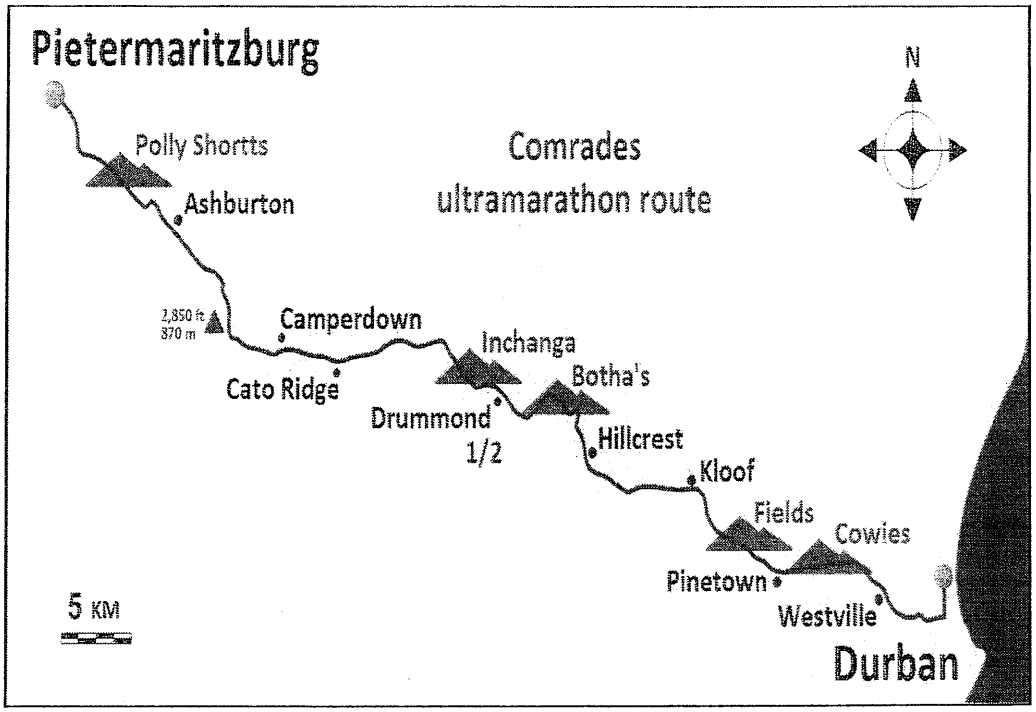
[Source: https://www.aroundaboutcars.com/more-info/south-african-road-distances. Accessed on 15 October 2022]

2.1.1 What is the distance between East London and Mafikeng? (2)

2.1.2 A family travels from Cape Town to Johannesburg and then proceeds to Bloemfontein. The family claims that the total distance travelled is 40 km more than the distance between Cape Town and Nelspruit. With calculations, prove whether their claim is valid. (6)

2.1.3 Calculate the time in hours and minutes that they will take to travel from Polokwane to Port Elizabeth, if they are travelling at an average speed of 105 km/h and have two breaks of 1 hour 15 minutes in total.
You may use the formula: **Distance = Speed x Time** (5)

2.2 The following image represents the Comrades Marathon route, which is a distance of 90 km, between Durban and Pietermaritzburg.



[Source: https://www.comrades.com/. Accessed on 16 October 2022.]

2.2.1 What type of scale is shown on the map? (2)

2.2.2 Use the given scale to calculate the straight-line distance in km between Hillcrest and Pinetown. (4)

2.2.3 Give the general direction from Camperdown to Westville. (2)

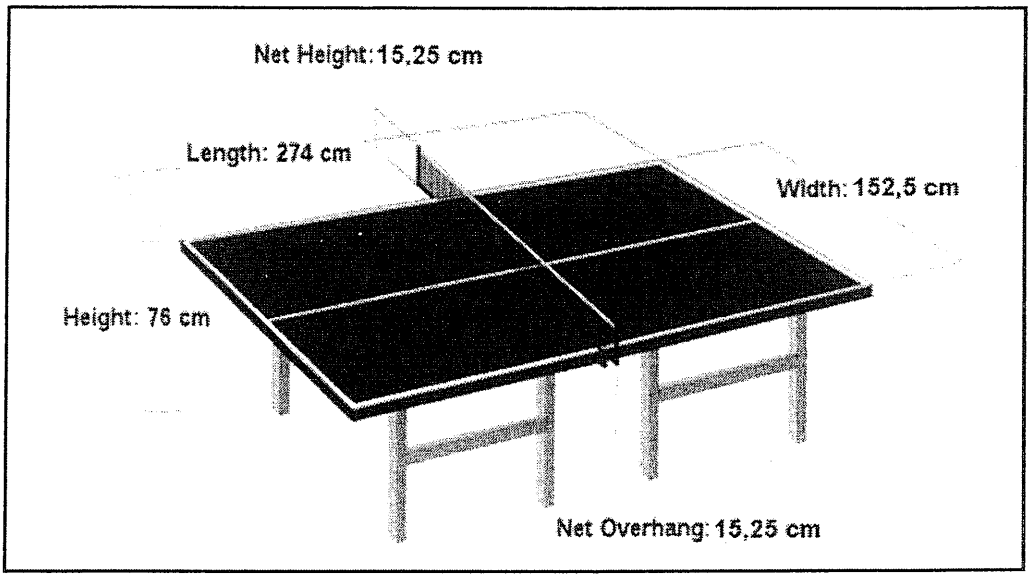
2.2.4 The map shows that 870 m = 2 850 feet. Determine, rounded-off to two decimals, the conversion factor in the form, 1 foot = … cm. (4)

[25]

QUESTION THREE [30 marks]

3.1 Table tennis is a very popular sport at the Olympic Games. The diagram below shows the dimensions of a table tennis table.

NOTE: The net has an overhang of 15,25 cm on both sides.



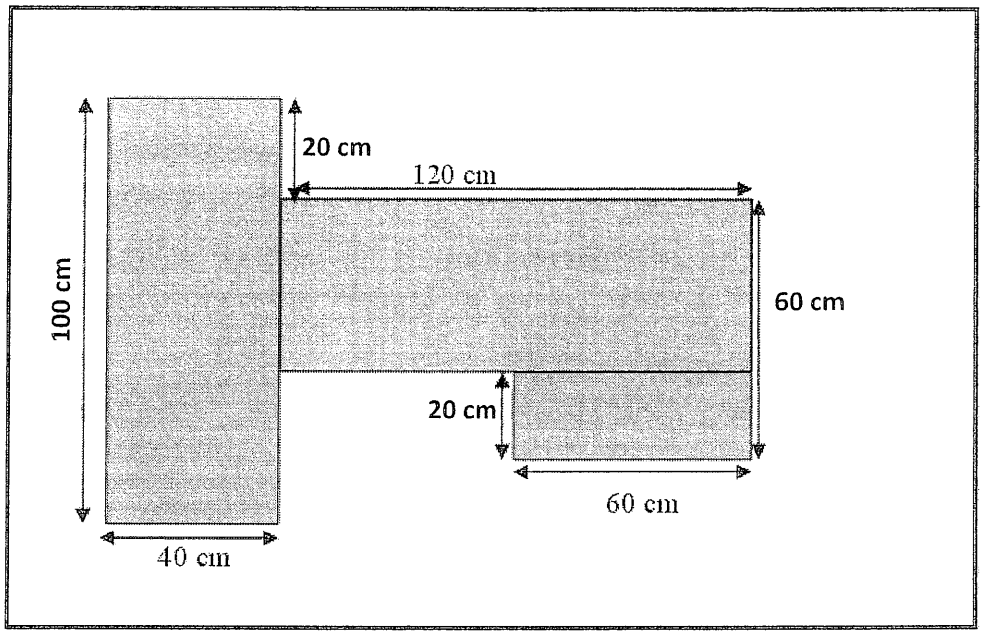
3.1.1 Determine the length of the net in cm. (3)

3.1.2 Calculate the difference between the length and the width of the table in mm. (3)

3.1.3 Table tennis players are serious about their fitness levels.
A game started at 10:08 and lasted for 1 hour and 58 minutes. At what time did the game end? (2)

3.1.4 One of the players argues that the height of the table from the bottom (ground) up to the top of the net is 60 cm less than the width of the table.
Prove, with calculations, whether his argument is valid. (5)

3.2 A Mathematical Literacy teacher is making teaching aids for a lesson on measurement for her classroom. She draws the shapes, paints them, and sticks them onto the classroom walls. The shape below with dimensions is one of her teaching aids.



3.2.1 A learner uses string to measure the perimeter of the shaded figure. What is the length of the string? (4)

3.2.2 Calculate the total area of the shape in m^2.
You may use the formula: **Area of a rectangle is = Length x Width** (5)

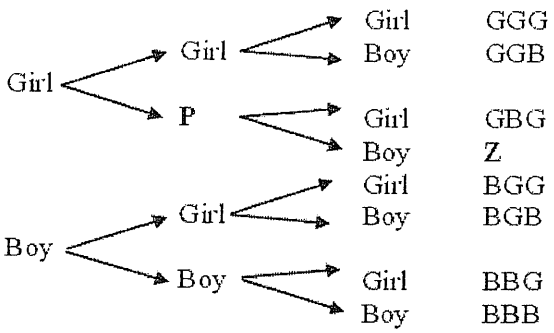
3.2.3 She paints this shape with two coats of paint and has prepared three of these shapes for her class. One litre of paint covers 6.2 m^2,
The teacher states that one litre of paint will be sufficient to paint all three sets of the above shapes with 2 coats of paint each.
Verify whether her statement is correct. (4)

3.2.4 The school has a large water tank that has a maximum capacity of 5 000 litres a diameter of 1.5 m. Determine the height of the water tank. (4)
You may use the formula: $V = \pi r^2 h$ | $1\ m^3 = 1000\ l$ |

[30]

QUESTION FOUR [26 marks]

4.1 Mr Johnathan and his wife plan to have two more children. Study the diagram below:



4.1.1 Identify the type of diagram shown above. (2)

4.1.2 Write down the appropriate items for P and Z. (2)

4.1.3 Determine the probability for Mr. Johnathan and his wife of:

(a) Getting at least two girls (as a fraction in simplified form) (3)
(b) Getting a boy, then a girl, then a boy (as a percentage) (2)

4.2 A young rugby player is concerned about his weight. He weighs himself before joining a gymnasium and calculates that his BMI (Body Mass Index) is 25,1 kg/m^2. He has a height of 175 cm. The table below shows the weight status versus the BMI ranges.

TABLE 2: WEIGHT STATUS ACCORDING TO BMI

BMI Range (Kg/m^2)	WEIGHT STATUS
Less than 18,5	Underweight
From 18,5–24,9	Normal weight
From 25–30	Overweight
More than 30	Obese

Refer to the table provided above and answer the questions that follow.

4.2.1 Write down the young player's current weight status. (2)

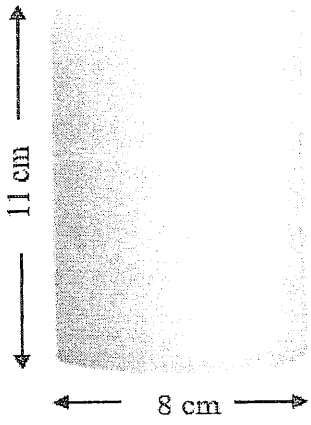
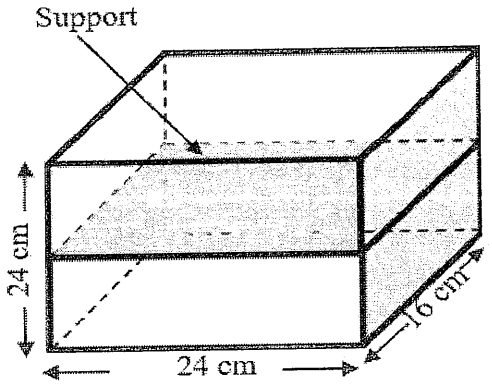
4.2.2 Use the information above to calculate his current weight (mass) to ONE decimal place.

You may use this formula: $BMI = \frac{Mass\ in\ kg}{height^2}$

NOTE: height must be in metres. (4)

4.2.3 Suggest **one** advice how the rugby player can improve his BMI status. (2)

4.3 James decided to distribute candles to local churches. He would like to pack cylindrical candles into a rectangular container for distribution. Each candle is 11 cm high and measures 8 cm in diameter.

Picture of candle (with dimensions)	Diagram of box used for candles
	

4.3.1 James realised that he can pack the candles upright on top of each other if he places a support that is 10 mm thick, between the layers. The container that he uses is 24 cm high, 16 cm wide and 24 cm long. James claimed that he can pack 12 candles in the container.

Verify, with calculations, if his claim is valid. (6)

4.3.2 James prints a label that covers the 4 sides of the container (not the top and bottom). Calculate the area of the label in square metres (m^2). You may use the following formula:

Area of all sides = 2 (length × height) + 2 (width × height) (3)

[26]

TOTAL: 100

education
Department:
Education
PROVINCE OF KWAZULU-NATAL

PINETOWN DISTRICT – MATHEMATICAL LITERACY

GRADE: 11
ASSESSMENT TYPE: November - Paper 2 2022
MARKING GUIDELINE

Symbols	Explanation
M	Method
MA	Method with accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
RT/RG/RM	Reading from Table/Graph/Map.
F	Choosing the correct formula
SF	Substitution in Formula
J	Justification
P	Penalty
R	Reason

QUESTION NUMBER	SOLUTION	MARK EXPLANATION	MARKS	SECTION & TAX LEVEL
1.1.1	Cylinder √√	2A	2	M L1
1.1.2	r = $\frac{d}{2}$ r = $\frac{400cm}{2}$ √ r = 200cm 200cm/100 √ = 2m √	1MA 1C (÷ 100) 1CA	3	M L2
1.1.3	¾ x 8,5m √ =6,375m / 6,38m √	1M 1R	2	M L2
1.1.4	C √√	2A	2	M L1
1.2.1	Strip Map √√	2A	2	MP L1
1.2.2	B√√	2A	2	MP L1
1.2.3	557km – 69km√ =488km√	1MA (CORRECT VALUES) 1CA	2	MP L2

1.2.4	N3 √ N5 √	1RM 1RM	2	MP L1
1.2.5	Right √√	2A	2	MP L1
2.1.1	1029 km√√	2A	2	MP L2
2.1.2	CT TO JHB = 1402km√ JHB TO BLM = 417km√ 1402km + 417km = 1819km √ CT TO NEL = 1779km√ Diff: 1819km – 1779km = 40km√ Yes, their claim is valid √	 2RT 1CA 1RT 1CA 1J	6	MP L4
2.1.3	Distance = Speed x Time 1393 = 105 x t √ $t = \frac{1393}{105}$ √ t = 13 hrs 16min√ Time of journey: 13hrs 16mins + 1hr 15mins√ = 14hrs 31 min √	 1 SF (For 1393 & 105) 1 M 1CA 1 M (Adding 1:15) 1CA	5	MP L2
2.2.1	Bar Scale √√	2A	2	MP L1
2.2.2	0,9cm√ : 5km 2,9cm√ is measured length 2,9 ÷ 0,9 × 5km√ = 16,1 km√ **OR** 0,9cm√ : 5km 3cm√ is measured length 3 ÷ 0,9 × 5km√ = 16,67 km√ **OR** 0,9cm√ : 5km 3,1cm√ is measured length 3,1 ÷ 0,9 × 5km√ = 17,22 km√	1A {ACCEPT BAR AS 1cm} 1A {ACCEPT 2,9 TO 3,1cm as measured length between the two places on map} 1M 1CA 1A 1A 1M 1CA 1M 1A 1M 1CA **Note: 14,5km / 15km / 15,5km will be full marks if bar scale measured as 1cm and either 2,9cm/3cm/3, 1cm is measured length respectively.**	4	MP L3

2.2.3	South East √√	2A	2	MP L1
2.2.4	870m = 2850ft 870 x 100cm√ = 2 850ft 87 000cm = 2 850ft√ $=\frac{87\,000}{2\,850}$ √ 1 ft = 30,53 cm√	 1C 1M 1M 1CA	4	M L2
3.1.1	152,5cm √ + 15,25cm + 15,25√ =183cm√	2A 1CA	3	M L2
3.1.2	L = 274cm = 2740 mm W = 152,5cm = 1525mm } √ 2 740mm – 1 525mm√ =1 215mm √ OR 274cm – 152,5cm√ = 121,5cm × 10√ = 1215mm√	 1 C 1CA 1 CA 1MA 1CA 1CA	3	M L3
3.1.3	10:08 + 1hr 58 min√ = 12:06pm√	1M 1A	2	M L1
3.1.4	Height = 76 + 15,25√ = 91,25 cm√ Width = 152,5 cm 152 – 91,25√ =61,25cm√ His claim is invalid√	1MA 1A 1CA 1CA 1J	5	M L4
3.2.1	Perimeter = 100 + **40** √ + 20 + 120 + 60 + 60 + 20 + **60** √+ **40**√ + 40 = 560cm √	3MA (addition with correct missing values in bold) 1CA	4	M L3
3.2.2	**Shape 1:** L: 100cm W: 40cm L = $\frac{100}{100}$ W: $\frac{40}{100}$ = 1m = 0,4m **Area: L x B** **1 x 0,4** $0,4m^2$√	 1A	5	M L3

	Shape 2: W : 60 – 20 = 40cm L: 120cm L: 120cm W: 40cm L = $\frac{120}{100}$ W: $\frac{40}{100}$ = 1,2m = 0,4m **Area: L x B** **1,2 x 0,4** $0,48m^2$**√** **Shape 3:** L: 60cm W: 20cm L = $\frac{60}{100}$ W: $\frac{20}{100}$ = 0,6m = 0,2m **Area: L x B** **0,6 x 0,2** $0,12m^2$**√** **Total area : 0,4m² + 0,48m² + 0,12m² √** = $1m^2$ **√**	1A 1A 1M ADDING 1CA		
3.2.3	Area = $1l$ x 2coats x 3 shapes**√** = $6m^2$**√** $\frac{6}{6,2} = 0,967\ litres\ needed\sqrt{}$ 1 litre covers 6,2m² Therefore TRUE, 1 litre is sufficient **√**	1CA from 3.2.2 1A 1A 1J	4	M L4
3.2.4	Radius = $\frac{1.5m}{2}$ = 0,75m**√** 5 000 l = 5 m^3 V = πr^2 x h $5m^3$ = 3,142 x $0.75m^2$ x h h = $\frac{5\ m^3}{3,142\ x\ 0.75m^2}$**√** = 2.83m**√** OR accept **h = 282.91 cm**	1MA 1C 1SF 1CA	4	M L3

	Shape 2: W : 60 – 20 = 40cm L: 120cm L: 120cm W: 40cm L = $\frac{120}{100}$ W: $\frac{40}{100}$ = 1,2m = 0,4m **Area: L x B** **1,2 x 0,4** $0{,}48m^2$√ **Shape 3:** L: 60cm W: 20cm L = $\frac{60}{100}$ W: $\frac{20}{100}$ = 0,6m = 0,2m **Area: L x B** **0,6 x 0,2** $0{,}12m^2$√ **Total area : 0,4m² + 0,48m² + 0,12m² √** **=** $1m^2$ **√**	1A 1A 1M ADDING 1CA		
3.2.3	Area = $1l$ x 2coats x 3 shapes√ = $6m^2$√ $\frac{6}{6{,}2} = 0{,}967\ litres\ needed\sqrt{}$ 1 litre covers 6,2m² Therefore TRUE, 1 litre is sufficient √	1CA from 3.2.2 1A 1A 1J	4	M L4
3.2.4	Radius = $\frac{1.5m}{2}$ = 0,75m√ 5 000 l = 5 m^3 V = πr^2 x h $5m^3$ = 3,142 x $0.75m^2$ x h h = $\frac{5\ m^3}{3{,}142\ x\ 0.75m^2}$√ = 2.83m√ OR accept **h = 282.91 cm**	1MA 1C 1SF 1CA	4	M L3

4.1.1	Tree Diagram√√	2A	2	P L1
4.1.2	P = Boy √ Z = GBB √	1A 1CA	2	P L1
4.1.3	A) $\frac{4\sqrt{}}{8\sqrt{}}$ $=\frac{1}{2}$√	1RT 1RT 1CA	3	P L1
	B) P (BGB) = $\frac{1}{8}$ x 100√ 12,5% √	1S 1A	2	P L1
4.2.1	Overweight √√	2A	2	M L1
4.2.2	$=\frac{175}{100}$ =1,75m√ 25,1 $=\frac{mass\ in\ kg}{1,75\ x\ 1,75}$√ Mass = BMI x $height^2$ Mass = 25,1 x $(1,75)^2$ √ Mass in Kg = 76, 86875 kg Mass in kg = 76, 87kg / 76,9kg√	 1C 1SF 1M 1CA	4	M L2
4.2.3	• Exercise • Change his diet • Drink lots of water Accept any logical answer √√	2O	2	M L2
4.3.1	No of Candles: L : 24cm/8cm = 3√ W: 16cm/8cm = 2√ H: 24cm **-1cm** / 11 = 2√ Total number of candles: = 3 x 2 x 2√ = 12 candles√ Statement is correct √	 1CA 1CA 1CA 1M 1A 1J	6	MP L4
4.3.2	TA = 2(H x L) + 2 (B x H) 2 (0,24 x 0,24) + 2 (0,16 x 0,24) √ $0,1152m^2$ + $0,0768m^2$√ $0,192m^2\sqrt{}$	 1SF 1M 1A	3	M L2

TOTAL: 100 MARKS

MATHEMATICAL LITERACY

TAXONOMY LEVELS

TASK: November Paper 2 - 2022

GRADE: 11

QUESTION	MARK	TOPICS					TAXONOMY LEVELS			
		FINANCE	MEASUREMENT	MAPS AND PLANS	DATA HANDLING	PROBABILITY	TAXONOMY LEVEL 1 (30%)	TAXONOMY LEVEL 2 (30%)	TAXONOMY LEVEL 3 (20%)	TAXONOMY LEVEL 4 (20%)
1.1.1	2		2				2			
1.1.2	3		3					3		
1.1.3	2		2					2		
1.1.4	2		2				2			
1.2.1	2			2			2			
1.2.2	2			2			2			
1.2.3	2			2				2		
1.2.4	2			2			2			
1.2.5	2			2			2			
2.1.1	2			2				2		
2.1.2	6			6						6
2.1.3	5			5				5		
2.2.1	2			2			2			
2.2.2	4			4					4	
2.2.3	2			2			2			
2.2.4	4			4				4		
3.1.1	3		3					3		
3.1.2	3		3						3	
3.1.3	2		2				2			
3.1.4	5		5							5
3.2.1	4		4						4	
3.2.2	5		5						5	
3.2.3	4		4							4
3.2.4	4		4						4	
4.1.1	2					2	2			
4.1.2	2					2	2			
4.1.3 (a)	3					3	3			
4.1.3 (b)	2					2	2			
4.2.1	2		2				2			
4.2.2	4		4					4		
4.2.3	2		2					2		
4.3.1	6		6							6
4.3.1	3		3					3		
WEIGHTING (as per CAPS) (±5)	100						30%	30%	20%	20%
% WEIGHTING	100						29%	30%	20%	21%