Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porofensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2024

MATHEMATICAL LITERACY P2

MARKS: **100**

TIME: **2 hours**

IMLIT2

This question paper consists of 9 pages, and an addendum with 2 annexures.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of FOUR questions.

2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   - ANNEXURE A for QUESTION 2.1
   - ANNEXURE B for QUESTION 4.2

3. Answer ALL the questions.

4. Number the answers correctly according to the numbering system used in this question paper.

5. Start EACH question on a NEW page.

6. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

7. Maps and diagrams are NOT drawn to scale, unless stated otherwise.

8. Round off ALL final answers appropriately according to the given context, unless stated otherwise.

9. Indicate units of measurement, where applicable.

10. Show ALL calculations clearly.

11. Write neatly and legibly.

QUESTION 1

1.1 Zanele and Reneiloe are driving to Pretoria one morning. Zanele departs from Randburg and picks up Reneiloe who stays in Midrand. The car is driven at an average speed of 100 km/h from Randburg to Midrand and then to Pretoria. The clock below shows the time at which Zanele left Randburg.

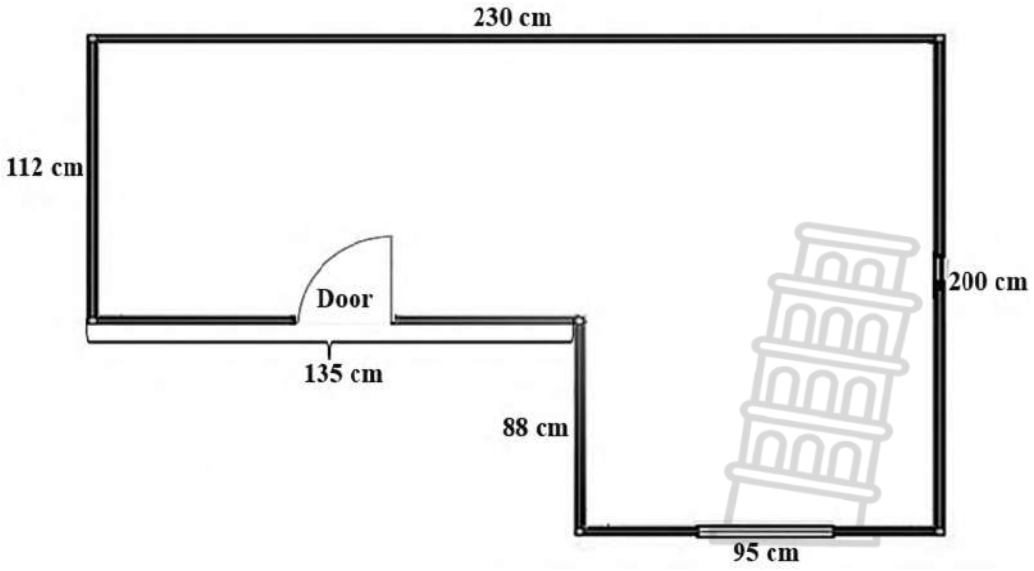
[Source: www.googleimages.com]

1.1.1 Identify the type of clock displayed above. (2)

1.1.2 Write down the time Zanele left home in words. (2)

1.1.3 Zanele arrived at Reneiloe's place at 10:27. Determine how long it took her to get to Midrand. (2)

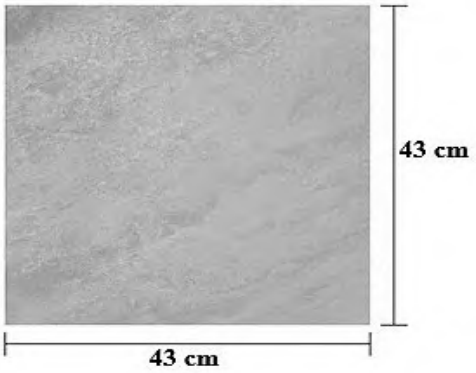
1.2 Sisanda drew the diagram below, showing the room she uses to study.



1.2.1 Define the term *perimeter*. (2)

1.2.2 Hence, calculate the perimeter of the room in centimetres. (2)

1.3 Timothy wants to lay ceramic tiles in his rectangular bedroom. Study the details of the size of the tiles that Timothy will use below and answer the questions that follow.

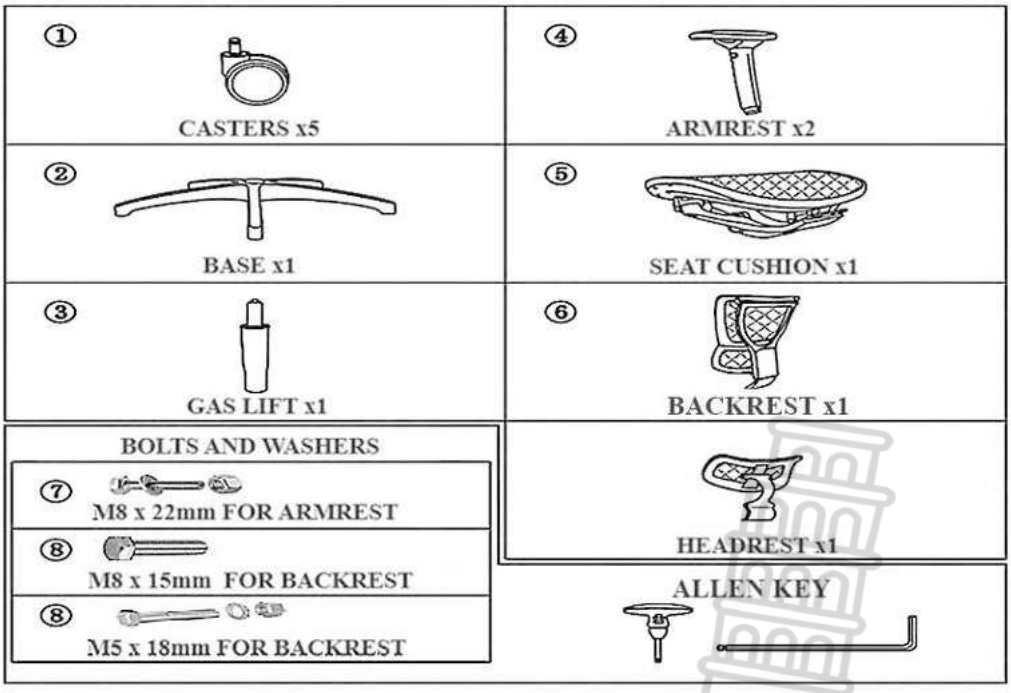


[Adapted from www.googleimages.com]

1.3.1 Convert 43 cm to metres (m). (2)

1.3.2 Hence, calculate the area of the tile in m^2.
You may use the following formula: **Area of a square = side × side** (2)

1.4 Study the list of items below that are needed to assemble an office chair and answer the questions that follow.



1.4.1 Identify the number of casters (wheels) needed to assemble the office chair. (2)

1.4.2 Name the tool that will be used to tighten the bolts and washers. (2)

1.4.3 List the different types of bolts and washers needed for the backrest. (2)

[20]

QUESTION 2

2.1 Knysna is a town in the Western Cape province of South Africa. The map of Knysna and surrounding areas in the Western Cape is shown in ANNEXURE A.

Use ANNEXURE A to answer the questions below.

2.1.1 Identify the national road on the map. (2)

2.1.2 In which general direction will you go if you travel from Belvidere Village to Leisure Island? (2)

2.1.3 The actual distance between Paradise and Hornlee is 7 km. Use the scale to calculate the map distance (to the nearest cm) between the two towns. (4)

2.2 Busisiwe lives in Knysna Heights and plans a trip to Pezula Estate where she will spend the weekend with her friends. The distance between Knysna Heights and Pezula Estate is 11,2 km travelled via the N2.

Busisiwe travels at an average speed of 100 km/h and she drives a Polo Vivo 1.4 with a fuel consumption of 5,7 litres per 100 km.

Use the map of Knysna and the above information to answer the following questions.

2.2.1 Calculate the approximate time, in minutes, that Busisiwe will take to travel from Knysna Heights to Pezula Estate.

You may use the following formula: $\textbf{Speed} = \frac{\textbf{Distance}}{\textbf{Time}}$ (4)

2.2.2 Busisiwe and her friends travelled an approximate distance, in and around Pezula Estate, of 156 km with her car. Determine the total distance Busisiwe travelled during the weekend including her trip to Pezula Estate and back. (3)

2.2.3 Busisiwe claims that she will spend less than R250,00 on petrol for her return trip including the weekend driving to and from Pezula Estate.

Verify, with the necessary calculations, whether her statement is valid or not.

NOTE: Cost of petrol = R24,45 per litre (5)

[20]

QUESTION 3

3.1 Hein bought a fish tank at Premium Aquatics. The fish tank, with dimensions, is shown in the picture below.

[Source: https://aquapap.com/fish-tanks]

Use the above information to answer the questions that follow.

3.1.1 Define the term *volume* in the context above. (2)

3.1.2 Calculate the height of the fish tank if the volume is 38,8 ft^3.

You may use the following formula:
Volume of fish tank = π × radius^2 × height, where **π = 3,142** (3)

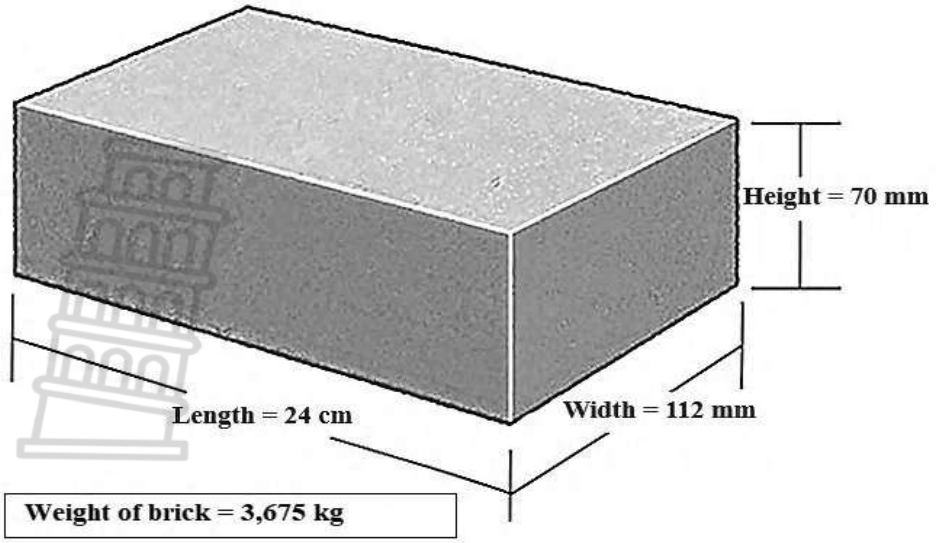
3.1.3 The required temperature for the fish tank is 72 °F. Hein claims that he needs to set the temperature to 22,2 °C to be equivalent to the required temperature.
Verify, with the necessary calculations, whether Hein's claim is valid or not.

You may use the following formula: $°C = (°F - 32^o) \times \frac{5}{9}$ (3)

3.1.4 The fish tank is 75% full of water. After adding stones to the bottom of the fish tank, the fish tank is 87% full of water.
Calculate the volume of the stones in cubic feet (ft^3). Round your final answer to ONE decimal place. (5)

3.1.5 Hein has 7 fish in his fish tank: 3 yellow, 1 blue, 2 red, and 1 silver. Determine the probability (as a percentage) of selecting a silver fish from the fish tank. (3)

3.2 Hein wants to build a cabinet to display his fish tank and to prevent it from falling and breaking. His bricklayer informed him that he would need about 2 500 bricks for the cabinet he has in mind. Below is an image of the brick they will use.



3.2.1 Calculate the total surface area (in mm^2) of one of the bricks needed for the wall display cabinet.

You may use the following formula:
Total Surface Area = [2 (l × w) + 2 (l × h) + 2 (w × h)] (4)

3.2.2 Determine the number of complete pallets transported by truck if one pallet contains 500 bricks. (2)

3.2.3 The weight of the pallets transported is 9 187,5 kg. Convert the weight of one pallet to ton.

NOTE: 1 000 kg = 1 ton (3)

3.2.4 Hein claims that the volume of all the bricks is 4,7 m^3. Verify, with the necessary calculations, whether Hein's claim is valid or not.

You may use the following formula:
Volume of one brick = Length × Width × Height (5)

3.2.5 One of the bricks that Hein is going to use costs R2,60 and the cost of delivery is R650.

Calculate the cost Hein will have to pay for the bricks that will be needed, including delivery. Round your final answer to the nearest hundred rand. (4)
[34]

QUESTION 4

4.1 Scranton is a hamlet in the town of Pennsylvania in New York, United States. Study the road map of Scranton in ANNEXURE B of the addendum and answer the questions below.

4.1.1 List TWO types of scales used on maps. (2)

4.1.2 Using the given scale, calculate the actual distance in miles between Clarks Summit and Archbald, if the distance on the map between these two places is 10,5 cm. (5)

4.1.3 A tourist must attend a conference in Blakely at 15:00. The travelling distance from his house to Blakely is 121,4 miles. He claims that if he leaves his house at 13:30 and stops at the petrol station for 25 minutes, he will be on time for his conference. The tourist travels at an average speed of 85 miles/hour.

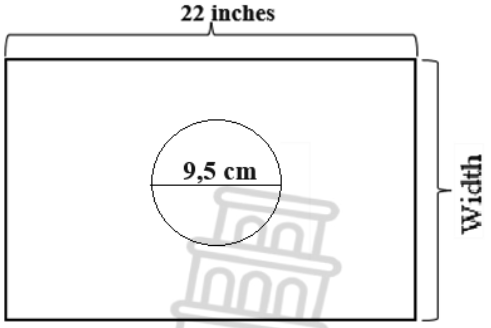
Verify, with the necessary calculations, whether his claim is valid or not.

You may use the following formula:

$$\textbf{Time} = \frac{\textbf{Distance}}{\textbf{Speed}}$$ (6)

4.1.4 Determine the probability of randomly selecting a road on the map that is a state road. (2)

4.2 Lwandile bought an Ugandan flag mounted on a rectangular wooden frame as shown in the diagrams below.
(Diagram NOT drawn to scale).

PICTURE OF THE UGANDAN FLAG	DIMENSIONS OF THE RECTANGULAR WOODEN FRAME
	

4.2.1 Show that the area of the white cloth needed to cover the circle is 70,89 cm^2.

You may use the following formula:
Area of a circle = π × radius^2, where **π = 3,142** (3)

4.2.2 Determine the width of the rectangular wooden frame in centimetres, if the area of the rectangular wooden frame, without the circle, is 2 682 cm^2.

You may use the following formula:
Area of a rectangle = Length × Width
NOTE: 1 inch = 2,54 cm (5)

4.2.3 Lwandile claims that the width of ONE of the rectangular bars is 8 cm.

Verify, with the necessary calculations, whether his claim is valid or not. (3)
[26]

TOTAL: 100

Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2024

MATHEMATICAL LITERACY P2 ADDENDUM

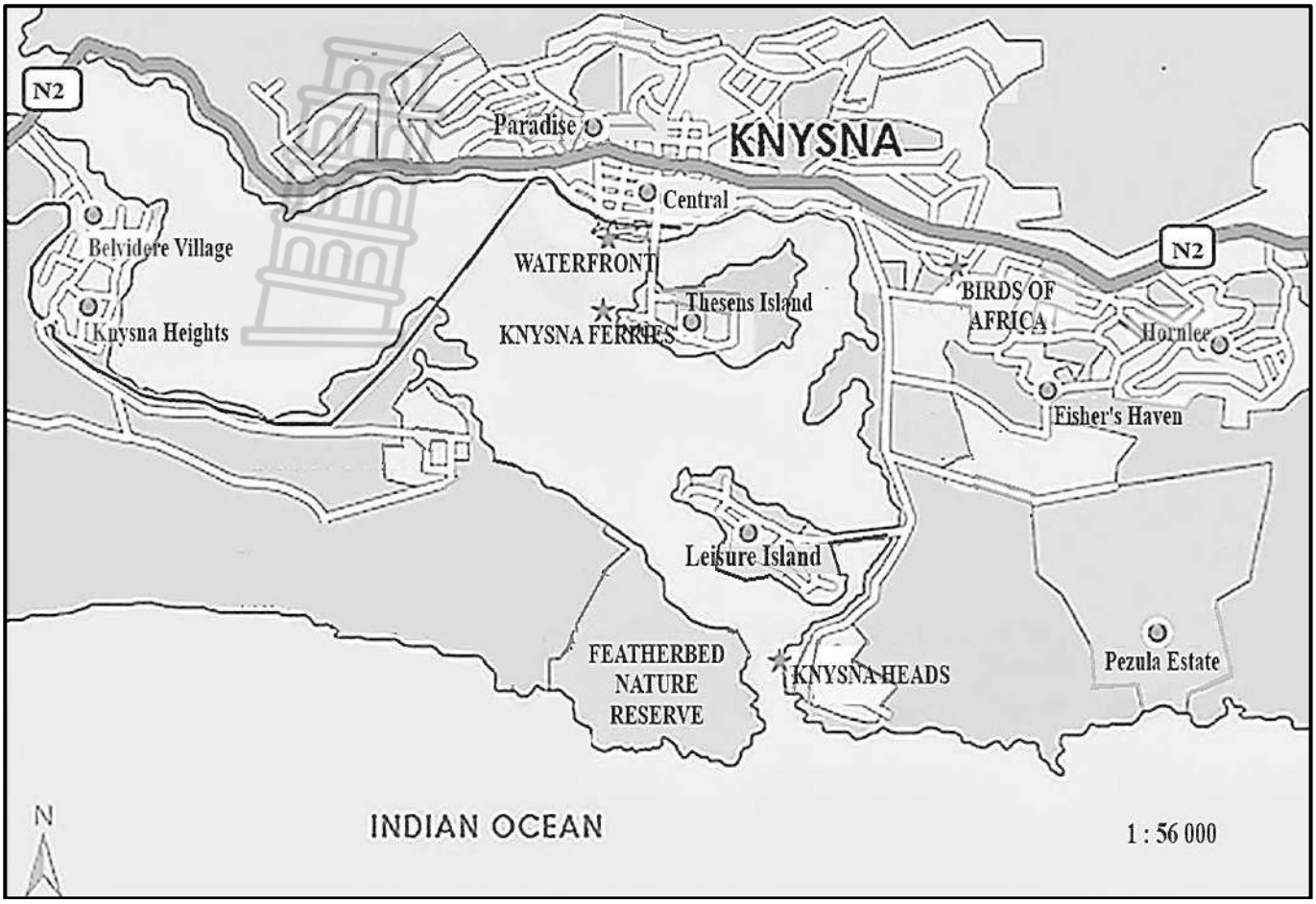
* I M L I T 4 *

This addendum consists of 3 pages.

ANNEXURE A

QUESTION 2.1

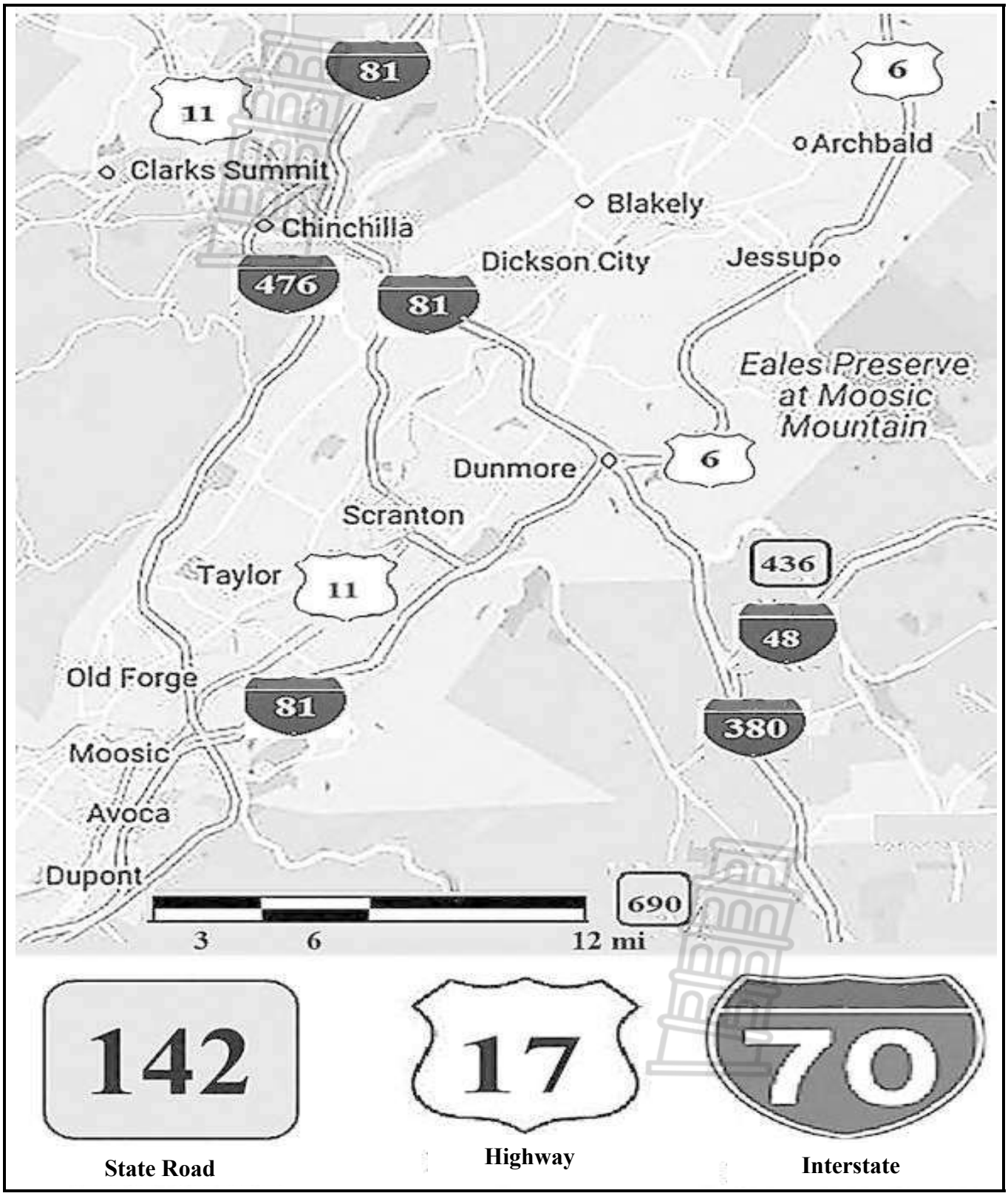
MAP OF KNYSNA AND SURROUNDING AREAS



ANNEXURE B

QUESTION 4.2

ROAD MAP OF SCRANTON IN PENNSYLVANIA, NEW YORK



[Adapted from ItsEasy Passport & Visa | Serving Scranton, Pennsylvania]

Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porofensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2024

MATHEMATICAL LITERACY P2
MARKING GUIDELINES

MARKS: **100**

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT	Reading from a table/graph/diagram
SF	Correct substitution in a formula
O	Opinion/Explanation/Reasoning
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding Off/Reason
NPR	No penalty for correct rounding minimum two decimal places
AO	Answer only
MCA	Method with consistent accuracy
RCA	Rounding with consistent accuracy

This marking guidelines consist of 11 pages.

MARKING GUIDELINES

NOTE:

- 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 penalize for every extra incorrect item presented.

KEY TO TOPIC SYMBOL:
F = Finance; M = Measurement; MP = Maps, plans and other representations; P = Probability

QUESTION 1 [20 MARKS] **ANSWER ONLY FULL MARKS**

Ques.	Solution	Explanation	Level
1.1.1	Analogue clock ✓✓A	2A correct type clock (2)	M L1
1.1.2	Ten minutes past ten o'clock in the morning. ✓✓A **OR** Ten past ten in the morning. ✓✓A **OR** Ten past ten before noon. ✓✓A	2A correct time (2)	M L1
1.1.3	Time taken = 10:27 -10:10 ✓M = 00:17 ∴ 17 minutes ✓A	1M subtracting time 1A correct time (2)	M L1
1.2.1	Perimeter is the distance around an object or shape. ✓✓A	2A definition (2)	M L1
1.2.2	Perimeter = 230 cm + 200 cm + 95 cm + 88 cm + 135 cm + 112 cm ✓MA = 860 cm ✓A **Accept if calculated as follows:** Perimeter = (230 × 2) + (200 × 2) ✓MA = 860 cm ✓A	1MA adding all the correct values 1A perimeter 1MA multiplying length and width by 2 1A perimeter (2)	M L1
1.3.1	Side or length = $\frac{43}{100}$ ✓C = 0,43 m ✓A	1C conversion 1A answer (2)	M L1
1.3.2	Area of a square = side × side = 0,43 × 0,43 ✓SF = 0,1849 ≈ 0,18 m^2 ✓MCA **(Accept 0,185 m^2)**	**CA from 1.3.1** 1SF substitution 1MCA area in m^2 **NPR** (2)	M L1
1.4.1	5 casters (wheels) ✓✓A	2A number of casters (2)	MP L1
1.4.2	Tool = Allen key ✓✓A	2A correct tool (2)	MP L1

1.4.3	M8 × 15 mm ✓A M5 × 18 mm ✓A	1A M8 × 15 mm 1A M5 × 18 mm **(Accept any order)** (2)	MP L1
		[20]	

QUESTION 2 [20 MARKS]

Ques.	Solution	Explanation	Level
2.1.1	N2 ✓✓A	2A correct national road (2)	MP L1
2.1.2	Southeast **OR** SE ✓✓A	2A correct direction (2)	MP L1
2.1.3	Map distance = 7 km × 100 000 ✓C = 700 000 cm ∴ $\frac{700\,000}{56\,000}$ ✓M = 12,5 cm ✓CA ≈ 13 cm ✓R **OR** Map distance = $\frac{56\,000}{100\,000}$ = 0,56 m ✓C ∴ $\frac{7}{0,56}$ ✓M = 12,5 cm ✓CA ≈ 13 cm ✓R	1C conversion 1M dividing by scale 1CA map distance 1R rounding **OR** 1C conversion 1M dividing by scale 1CA map distance 1R rounding (4)	MP L2
2.2.1	Speed = $\frac{Distance}{Time}$ 100 km/h = $\frac{11,2\ km}{Time}$ ✓SF ∴ Time = $\frac{11,2\ km}{100\ km/h}$ ✓M = 0,112 hours × 60 ✓C = 6,72 minutes ✓CA **(Accept 7 minutes)** **Accept if calculated the time as follows:** = 0,112 × 60 = 6 minutes, 43,2 sec **(full marks)**	1SF substitution 1M changing subject of formula 1C converting hours to minutes 1CA time **NPR** (4)	MP L3
2.2.2	✓M Total Distance = (11,2 km × 2) + 156 km ✓M = 178,4 km ✓A	1M multiplying by 2 1M adding 156 km 1A total distance (3)	MP L2

2.2.3	Number of litres of petrol $= \frac{178,4}{100} \times 5,7$ ✓M $= 10,1688$ litres ✓A ∴ Cost $= R24,45 \times 10,1688$ ✓M $= R248,63$ ✓MCA ∴ Her statement is valid ✓O **OR** Number of litres of petrol $= \frac{5,7}{100} \times 178,4$ ✓M $= 10,1688$ litres ✓A ∴ Cost $= R24,45 \times 10,1688$ ✓M $= R248,63$ ✓MCA ∴ Her statement is valid ✓O	**CA from 2.2.2** 1M dividing by 100 and multiplying with 5,7 1A number of litres 1M multiply with R24,45 1MCA petrol cost 1O opinion **OR** 1M dividing by 100 and multiplying with 178,4 1A no. of litres 1M multiply with R24,45 1MCA petrol cost 1O opinion (5)	F L4
		[20]	

QUESTION 3 [34 MARKS]

Ques.	Solution	Explanation	Level
3.1.1	Volume is the amount of space inside the fish tank. ✓✓A	2A definition (2)	M L1
3.1.2	Volume of a cylindrical prism = $\pi \times \text{radius}^2 \times \text{height}$ $38,8\ ft^3 = 3,142 \times 2,1^2 \times \text{height}$ ✓SF $38,8\ ft^3 = 13,85622 \times \text{height}$ $\therefore \text{Height} = \frac{38,8}{13,85622}$ ✓M $= 2,8$ foot ✓CA	1SF substitution 1M divide correct values 1CA height (3)	M L2
3.1.3	$°C = (°F - 32^0) \times \frac{5}{9}$ $= (72\ °F - 32^0) \times \frac{5}{9}$ ✓SF $= 22,222\ldots$ $\approx 22,2\ °C$ ✓A $\therefore$ Hein's claim is valid ✓O	1SF substitution 1A temperature 1O opinion (3)	M L4
3.1.4	Volume of stones = 87% – 75% ✓M = 12% ✓A $\therefore \frac{12}{100} \times 38,8$ ✓M $= 4,656\ ft^3$ ✓CA $\approx 4,7\ ft^3$ ✓R **OR** Volume of water and stones in tank = $\frac{87}{100} \times 38,8$ ✓M $= 33,756\ ft^3$ Volume of water before stones added = $\frac{75}{100} \times 38,8$ ✓M $= 29,1\ ft^3$ $\therefore$ Volume of stones = $33,756\ ft^3 - 29,1\ ft^3$ ✓M $= 4,656\ ft^3$ ✓CA $\approx 4,7\ ft^3$ ✓R	1M subtracting percentages 1A correct % 1M multiply with 38,8 1CA volume of stones 1R rounding **OR** 1M calculating 87% 1M calculating 75% 1M subtracting volumes 1CA volume of stones 1R rounding (5)	M L3
3.1.5	Probability = $\frac{1}{7}$ ✓A $\times 100\ \%$ ✓M $= 14,2857\ldots$ $\approx 14,29\%$ ✓CA **(Accept 14,3% OR 14,286%)**	1A correct fraction 1M multiply with 100% 1CA probability as % **NPR** (3)	P L2

3.2.1	Total SA = [2 (l × w) + 2 (l × h) + 2 (w × h)] ✓C = [2 (240 × 112) + 2 (240 × 70) + 2 (112 × 70)]✓SF = 53 760 + 33 600 + 15 680 ✓S = 103 040 mm^2 ✓CA	1C conversion 1SF substitution 1S simplification 1CA total SA (4)	M L2
3.2.2	Number of complete pallets = $\frac{2\,500}{500}$ ✓MA = 5 pallets ✓A	1MA dividing correct values 1A number of pallets (2)	M L1
3.2.3	Weight of one pallet = $\frac{9\,187}{5}$ ✓M = 1 837,5 kg ∴ = $\frac{1\,837,5}{1\,000}$ ✓C = 1,8375 ton ✓CA **OR** Weight of one pallet = 500 × 3,675 ✓M = 1 837,5 kg ∴ = $\frac{1\,837,5}{1\,000}$ ✓C = 1,8375 ton ✓CA	1M dividing weight by 5 1C conversion 1CA weight of one pallet **OR** 1M multiplying 500 with 3,675 1C conversion 1CA weight of one pallet (3)	M L2
3.2.4	Volume of a rectangular prism = Length × Width × Height ✓SF = 240 mm × 112 mm × 70 mm = 1 881 600 mm^3 ∴ 1 881 600 × 2 500 ✓M = 4 704 000 000 mm^3 ∴ $\frac{4\,704\,000\,000}{1\,000\,000\,000}$ ✓C = 4,704 m^3 ✓CA ≈ 4,7 m^3 ∴ Hein's claim is correct ✓O **OR** Volume of a rectangular prism = Length × Width × Height ✓C ✓SF = 0,24 m × 0,112 m × 0,070 m = 0,0018816 m^3 ∴ 0,0018816 × 2 500 ✓M = 4,704 m^3 ✓CA ≈ 4,7 m^3 ∴ Hein's claim is correct. ✓O	1SF substitution 1M multiply volume with 2 500 bricks 1C convert volume to m^3 1CA volume of all bricks 1O opinion **OR** 1C conversion 1SF substitution 1M multiply volume with 2 500 bricks 1CA volume of all bricks 1O opinion (5)	M L4

3.2.5	Total cost = R2,60 × 2 500✓M = R6 500 + R650 (delivery) ✓M = R7 150 ✓CA ≈ R7 200 ✓R	1M multiply cost with number of bricks 1M adding delivery costs 1CA total cost 1R rounding (4)	F L2
		[34]	

QUESTION 4 [26 MARKS]

Ques.	Solution	Explanation	Level
4.1.1	Graphic scale ✓A **OR** Bar scale ✓A **OR** Linear scale ✓A Ratio scale ✓A **OR** Numeric scale ✓A	1A bar scale 1A number scale (2)	MP L1
4.1.2	Scale = 6,7 cm ✓A 6,7 cm = 12 miles $\frac{6,7\ cm}{6,7} = \frac{12\ miles}{6,7}$ ✓M 1 cm : 1,791044776 miles ✓CA ∴ Actual distance = 10,5 cm × 1,7910… ✓M = 18,80597015 miles ≈ 18,81 miles ✓CA **(Accept 18,806 miles OR 19 miles)**	1A measuring scale in cm 1M divide by 6,7 1CA scale 1M multiply 10,5 cm with the scale 1CA actual distance **NPR** (5)	MP L3
4.1.3	Time $= \frac{Distance}{Speed}$ $= \frac{121,4\ miles}{85\ miles/h}$ ✓SF = 1,4282… hours ∴ 0,4282… × 60 ✓C = 25,694… minutes ∴ Time = 1 hour 25 minutes 42 seconds ✓CA Arrival time = 13:30:00 (departure) 01:25:42 (travelling) ✓M 00:25:00 (stop at petrol station) = 15:20:42 ✓CA ∴ His claim is invalid. ✓O **If calculated as follows, DO NOT penalize:** Travel time = 1h26 min Arrival time = 13:30 01:26 00:25 = 15:21	1SF substitution 1C converting hours to minutes 1CA travel time 1M adding time 1CA arrival time 1O opinion (6)	MP L4
4.1.4	Probability = $\frac{2}{8}$ ✓A ✓A (**Accept simplified form** = $\frac{1}{4}$) ✓A ✓A	1A numerator 1A denominator (2)	P L2
4.2.1	Radius $= \frac{9,5}{2}$ = 4,75 cm ✓M Area of a circle = π × radius^2 = 3,142 × 4,75^2 ✓SF = 70,891375 ≈ 70,89 cm^2 ✓CA	1M finding radius 1SF substitution 1CA area of white cloth (3)	M L2
4.2.2	Length of wooden frame = 22 inches × 2,54 ✓C = 55,88 cm ✓A Area of rectangle = length × width 2 682 = 55,88 × width ✓SF ∴ Width = $\frac{2\ 682}{55,88}$ ✓M = 47,9957 … ≈ 48 cm ✓CA **(Aanvaar 47,996 cm)**	1C converting length 1A answer 1SF substitution 1M dividing area by length 1CA width (5)	M L3

4.2.3	Width of one rectangular bar $= \frac{48}{6}$ ✓MCA $= 8$ cm ✓CA ∴ Lwandile's claim is valid. ✓O **OR** Width of one rectangular bar $= \frac{47,996}{6}$ ✓MCA $= 7,9993\ldots$ cm ≈ 8 cm ✓CA ∴ Lwandile's claim is valid. ✓O	**CA from 4.2.2** 1MCA dividing width by 6 1CA width of rectangular bar 1O opinion **OR** 1MCA dividing width by 6 1CA width of rectangular bar 1O opinion (3)	M L4
		[26]	
		TOTAL: 100	