basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

2022

MARKS: 150

TIME: 3 hours

This question paper consists of 13 pages and an addendum with 4 annexures.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.

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

   - ANNEXURE A for QUESTION 2.1
   - ANNEXURE B for QUESTION 2.2
   - ANNEXURE C for QUESTION 4.1
   - ANNEXURE D for QUESTION 5.2

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), unless 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 necessarily drawn to scale, unless stated otherwise.

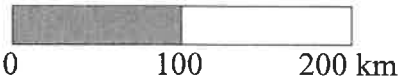
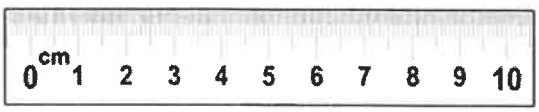
10. Write neatly and legibly.

QUESTION 1

1.1 Sifiso is a builder who uses building plans and measuring instruments.

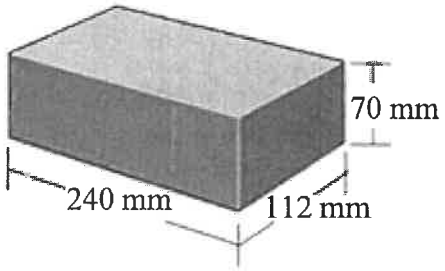
Some measuring instruments and scales used by builders are shown below.

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–G) next to the question numbers (1.1.1 to 1.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B
1.1.1	The most appropriate scale to draw a map of South Africa	A 
1.1.2	The instrument most suited to measure the circumference of a dinner plate	B 
1.1.3	The most appropriate scale to draw a plan of a house	C 
1.1.4	The instrument most suited to measure the width of a soccer field	D 1 : 50 000
1.1.5	The instrument most suited to measure the length of a pencil	E 
		F 
		G 1 cm = 1 m

(5 × 2) (10)

1.2 The sketch below shows a standard brick, with dimensions, used in South Africa.

SKETCH OF A STANDARD BRICK	DIMENSIONS OF THE BRICK
	Height = 70 mm Width = 112 mm Length = 240 mm

Use the information above to answer the questions that follow.

1.2.1 State which formula (**A**, **B** or **C**) below can be used to calculate the total surface area (TSA) of the given brick.

A $TSA_{(brick)}$ = Area of front side + Area of right-hand side + Area of top

B $TSA_{(brick)} = (2 \times 240 \times 70 + 2 \times 240 \times 112 + 2 \times 112 \times 70)\ mm^2$

C $TSA_{(brick)} = (240 \times 70 + 240 \times 112 + 112 \times 70)\ mm^2$ (2)

1.2.2 State the unit of measurement for the volume of this brick. (2)

1.2.3 Convert the length of this brick to metres. (2)

1.2.4 Determine the maximum number of rows of bricks that can be stacked height-wise to a height of 2 100 mm. (3)

1.3 Maria uses the recipe below to bake scones.

Ingredients (makes 1 dozen)	**Picture of the scones**
75 g butter 2 large eggs 75 g sugar 4 teaspoons baking powder 230 mℓ milk 500 g flour 1 cup raisins	
Baking Instruction	
Bake for 15 minutes at 200 °C.	

Use the information above to answer the questions that follow.

1.3.1 Convert the mass of the flour to kilograms. (2)

1.3.2 Determine the number of large eggs needed to make **30** scones. (2)

1.3.3 Each scone has an average diameter of 7 cm.

Write down the average radius of EACH scone. (2)

1.3.4 Calculate how many full dozen scones can be made with 500 g of butter. (3)

1.3.5 The scones were placed in the oven to bake at 14:10.

Write down, in words, the time the scones were placed in the oven. (2)
[30]

QUESTION 2

2.1 Busisiwe participated in a Vhi Women's Mini Marathon. ANNEXURE A shows the route for the mini-marathon.

Use ANNEXURE A and the information above to answer the questions that follow.

2.1.1 Write down the starting time of the mini-marathon using the 24-hour format. (2)

2.1.2 Determine the number of places where an ambulance can be found. (2)

2.1.3 State which mode of transport is NOT allowed on the mini-marathon route. (2)

2.1.4 The distance of a standard marathon is 42,2 km.

(a) Determine, in simplified form, what fraction of a standard marathon the Vhi Women's Mini Marathon is. (4)

(b) Give ONE reason why the Vhi Women's Mini Marathon is called a mini-marathon. (2)

2.1.5 Choose the answer and write only the letter (A–C) next to the question number (2.1.5).

The probability of a runner crossing the railway line during the mini-marathon is …

A definite.

B 0%.

C 100%. (2)

2.2 Busisiwe lives in Irene.

ANNEXURE B shows the layout plan of Irene. Some streets end in a cul-de-sac[1]. The arrows on some streets show the traffic flow in one direction only (one-way streets).

NOTE:
[1]Cul-de-sac – a street ending in a dead end, that is, having only one entry/exit

Use ANNEXURE B and the information above to answer the questions that follow.

2.2.1 Write down the place of interest that is situated at the corner of Krige Street and Bruce Street. (2)

2.2.2 Give the general direction from Bastion Guest House to the Station & Shopping Centre. (2)

2.2.3 Name the street that the railway lines cross. (2)

2.2.4 Give the name of the church found in King Street. (2)

2.2.5 Busisiwe gives David the following travelling instructions to meet her:

- Drive from Irene Pre-Primary east along Crawford Street.
- Turn left into Queen Street.
- Take the first right into Stanley Street and continue to King Street.
- Turn right into King Street, pass five streets and then turn left.
- Continue across the first street. Before the next intersection Busisiwe will be waiting for David.

Identify the place where Busisiwe will be waiting for David. (3)

2.2.6 The actual straight-line distance (as the crow flies) from the entrance of Irene Pre-Primary to the entrance of Irene Primary School is 1,9 km.

Determine, rounded to the nearest thousand, the scale of the layout plan in the form **1 : …** (5)

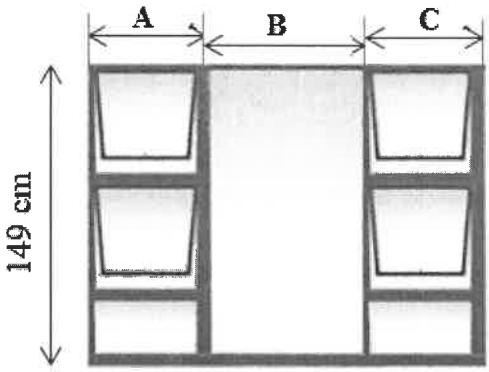
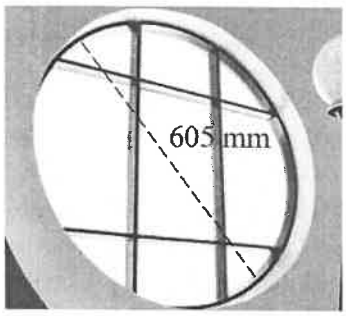
2.2.7 Explain why a driver travelling along King Street cannot turn right into Bruce Street. (2)
[32]

QUESTION 3

3.1 Tshego is renovating her home. She is removing the wooden-framed windows and is replacing them with aluminium-framed windows.

The dimensions and the shape of two of the window frames are given below.

In the rectangular window frame, four windows can open. It has three sections: A, B and C. The circular window frame has no windows that can open.

RECTANGULAR WINDOW FRAME	**CIRCULAR WINDOW FRAME**
	
Outer dimensions of the window frame: Length **A** = 55 cm, **B** = 99 cm and **C** = 55 cm. Width = 149 cm	Inner diameter = 605 mm

[Source: www.premiumaluminium.co.za]

The following formulae may be used:

Area of a rectangle = length × width

Area of a circle = 3,142 × (radius)^2

Perimeter of a rectangle = 2(length + width)

Circumference of a circle = 3,142 × diameter

Use the information above to answer the questions that follow.

3.1.1 Determine the perimeter of the rectangular window frame. (3)

3.1.2 Calculate the inner area in cm^2 of the circular window frame. (4)

3.1.3 One of the windowpanes of the rectangular window frame broke.

Write the probability, as a decimal, that it is NOT one of the windowpanes that can open. (3)

3.2 Tshego also intends tiling the dining room and lounge floors.

The dimensions of the lounge floor are 4 m by 5 m and of the dining room floor 3 m by 4 m.

Information and cost:

- Tshego intends using tiles that are 35 cm by 35 cm.
- One box of 4 tiles costs R143,84.
- Tile cement costs R99,90 per 20 kg bag, which covers 3 m^2.
- She needs 4 bags of tile grout at R89,90 per 5 kg bag.
- The cost of labour is R2 500.
- Tshego's total budget for the tiling project is R15 000.

Use the information above to answer the questions that follow.

3.2.1 Show that the total floor area to be tiled is 32 m^2.

You may use this formula:

Area of a rectangle = length × width (2)

3.2.2 Determine how many boxes of tiles Tshego will need if an extra 10% of the number of tiles must be added for cutting and breakages. (9)

3.2.3 Show by means of calculations if Tshego's budget is enough to finish the tiling project. (8)
[29]

QUESTION 4

4.1 ANNEXURE C shows the seating plan for a cinema during the Covid-19 pandemic. Seats marked with an 'X' need to be left vacant in order to comply with social distancing regulations.

Use ANNEXURE C and the information above to answer the questions that follow.

4.1.1 On which side of the cinema is seat E4 from seat E15 when a person is facing the screen? (2)

4.1.2 Assume that pre-Covid-19 conditions apply and all the seats are occupied.

(a) Name the row and seat number of the middle seat in the 8^{th} row from the screen. (2)

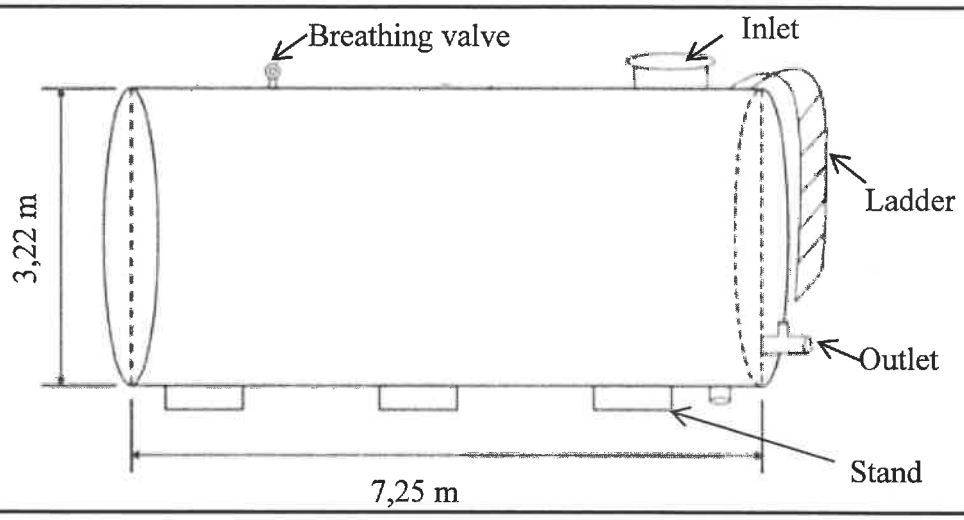
(b) Write down the ratio of the number of wheelchair spaces to the number of seats for patrons NOT in wheelchairs. (3)

4.1.3 On Friday evenings, pre-Covid-19, all the seats in the cinema (excluding the wheelchair spaces) were always occupied.

Calculate the percentage income lost due to social distancing during the pandemic if ALL the tickets for the seats are equally priced. (3)

4.2 The cinema owners use a generator to continue showing movies during load shedding. The diesel for the generator is stored in a cylindrical diesel tank, as shown below.

CYLINDRICAL DIESEL TANK



[Source: abovegroundstoragetanks.com]

INFORMATION:

- The stand and all external attachments are made of stainless steel and will not be painted.
- The base area of these external attachments is 1 m^2.
- 1 m^3 = 1 000 ℓ
- All dimensions shown are outer measurements.

Use the information above to answer the questions that follow.

4.2.1 State the purpose of the breathing valve on the tank. (2)

4.2.2 The steel used to make the tank is 5 mm thick all around. For safety reasons, the tank is filled to 95% of its capacity.

(a) Show that the inner diameter of the tank is 3,21 m. (2)

(b) Calculate the maximum litres of diesel that this tank can hold according to safety regulations.

You may use this formula:

Volume of a cylinder = 3,142 × (radius)^2 × height (8)

4.2.3 The external surface area of the tank, excluding the base area of the external attachments, needs to be painted. The spread rate of the paint is 3 $m^2/ℓ$. The manager states that he would need less than 30 litres of paint to complete the task.

Verify, by showing ALL calculations, whether the manager is CORRECT.

You may use this formula:

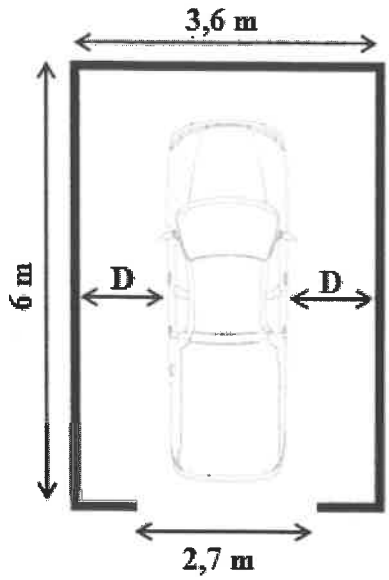
Surface area of a cylinder (in m^2) = 2 × 3,142 × r (r + h),
where **r** = radius and **h** = height. (8)

[30]

QUESTION 5

5.1 Letitia buys a new bakkie with a portion of her retirement funds.

Dimensions of her bakkie and her existing garage are shown below.

DIMENSIONS OF HER BAKKIE	INNER DIMENSIONS OF HER GARAGE
 [Source: www.automobiledimensions.com] Width = 1 860 mm Length = 5 362 mm Height = 1 815 mm	

[Source: www.bing.com]

Use the information above to answer the questions that follow.

5.1.1 Identify which view of the bakkie is represented by the dimensions 1 815 mm × 1 860 mm. (2)

5.1.2 Calculate the value of **D** (the space between the sides of the bakkie and the side walls of the garage) if the bakkie is parked exactly in the middle of the garage. (4)

5.1.3 Letitia needs to choose a colour and window tint.

The bakkie comes in four colours: white, black, blue and green. The windows can be tinted using 35% tint or 50% tint.

State how many different choices there are for this bakkie. (2)

5.2 Letitia studied a strip chart connecting Springbok in South Africa with Windhoek in Namibia.

On ANNEXURE D is a strip chart showing road distances in kilometres from Springbok to Windhoek.

Use ANNEXURE D to answer the questions that follow.

5.2.1 State ONE difference between a *strip chart* and a *normal road map.* (2)

5.2.2 Determine the distance between Springbok and Gobabis. (3)

5.2.3 Identify the Namibian town found on the border between South Africa and Namibia. (2)

5.2.4 Letitia undertook the following trip:

- She left Solitaire at 04:00 and travelled 140 km south on C14.
- She then turned right and travelled 289 km east on C19.
- At Mariental she turned, then drove to Keetmanshoop and arrived at 12:25.

(a) Calculate the total distance Letitia travelled during this trip. (3)

(b) Letitia travelled on different types of roads and she maintained the average speed limit prescribed for these types of roads. She stopped three times during the trip to take a break.

Letitia stated that the three breaks were approximately 25 minutes each.

Verify, with calculations, whether Letitia's statement is CORRECT.

You may use this formula: $\textbf{Time} = \dfrac{\textbf{Distance}}{\textbf{Speed}}$ (11)

[29]

TOTAL: 150

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SENIORSERTIFIKAAT-EKSAMEN/
NASIONALE SENIORSERTIFIKAAT-EKSAMEN

MATHEMATICAL LITERACY P2/*WISKUNDIGE GELETTERDHEID V2*

2022

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

Symbol/*Kode*	**Explanation/*Verduideliking***
M	Method/*Metode*
MA	Method with accuracy/*Metode met akkuraatheid*
CA	Consistent accuracy/*Volgehoue akkuraatheid*
A	Accuracy/*Akkuraatheid*
C	Conversion/*Herleiding*
S	Simplification/*Vereenvoudiging*
RT	Reading from a table/graph/document/diagram/*Lees vanaf tabel/grafiek/dokument/diagram*
SF	Correct substitution in a formula/*Korrekte vervanging in 'n formule*
O	Opinion/Explanation/*Opinie/Verduideliking*
P	Penalty, e.g. for no units, incorrect rounding off, etc./*Penalisasie, bv. vir geen eenhede, verkeerde afronding, ens.*
R	Rounding off/*Afronding*
NPR	No penalty for correct rounding/*Geen penalisasie vir korrekte afronding nie*
AO	Answer only/*Slegs antwoord*
MCA	Method with consistent accuracy/*Metode met volgehoue akkuraatheid*
RCA	Rounding consistent with accuracy/*Afronding met volgehoue akkuraatheid*
*****	Asterisk means refer to attached notes

These marking guidelines consist of 19 pages.
Hierdie nasien riglyne bestaan uit 19 bladsye.

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.
- Note: Consistent accuracy (CA) does NOT apply in cases of a breakdown.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra item presented.
- As a general marking principle, if a candidate has incurred one mistake and there is evidence of sound mathematics thereafter, then that candidate should lose ONE mark only.

LET WEL:
- *As'n kandidaat'n vraag TWEE KEER beantwoord, sienslegs die EERSTE pogingna.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, sien die doodgetrekte (gekanselleerde) poging na.*
- *Volgehoue akkuraatheid (CA) word in ALLE aspekte van die nasienriglyne toegepas, dit hou op by die tweede berekeningsfout.*
- *Let wel: Volgehoue akkuraatheid (CA) geld NIE in die geval van 'n afbreuk NIE.*
- *Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart geneem het en ekstra antwoorde gee, penaliseer vir elke ekstra item.*
- *'n Algemene nasienbeginsel is dat, indien 'n kandidaat een fout maak en daarna voortgaan met korrekte wiskunde, die kandidaat slegs EEN punt verloor.*

QUESTION/*VRAAG* 1 [30 MARKS/*PUNTE*] – ANSWER ONLY ACCEPTED			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
1.1.1	D ✓✓ A	2A correct option Accept 1:50 000 (2)	MP L1
1.1.2	E ✓✓ A	2A correct option (2)	M L1
1.1.3	G ✓✓ A	2A correct option Accept 1 cm = 1 m (2)	MP L1
*1.1.4	C ✓✓ A	2A correct option (2)	M L1
*1.1.5	F ✓✓ A	2A correct option (2)	M L1
1.2.1	B ✓✓ A **OR/*OF*** $(2 \times 240 \times 70 + 2 \times 240 \times 112 + 2 \times 112 \times 70)$ mm^2	2A correct option (2)	M L1
*1.2.2	✓✓ A mm^3 **OR** Cubic millimetres/*Kubieke millimeter*	2A correct unit (2)	M L1
1.2.3	✓ C Length/*Lengte* = 240 ÷ 1 000 = 0,24 m ✓ A	1C conversion factor 1A simplification (2)	M L1

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
*1.2.4	Number of rows/*Getal rye* $= \frac{2\ 100\text{ mm}}{70\text{ mm}}$ ✓ A ✓ A = 30 ✓ CA	1A height 1 A correct denominator 1CA number of rows (3)	MP L1
1.3.1	Mass of the flour (in kg)/*Massa van die meel* $= \frac{500}{1\ 000}$ ✓ C $= \frac{1}{2}$ kg **or/*of*** 0,5 kg ✓ A	1C divide by 1 000 1A simplification (2)	M L1
1.3.2	✓ A 12 scones/*botterbroodjies* = 2 eggs/*eiers* 6 scones/*botterbroodjies* = 1 egg/*eier* 30 scones = 2 + 2 + 1 = 5 eggs/*eiers* ✓ A **OR/*OF*** ✓ A 12 scones/*botterbroodjies* = 2 eggs/*eiers* 30 scones/*botterbroodjies* = $\frac{30}{12} \times 2$ = 5 eggs/*eiers* ✓ A **OR/*OF*** ✓ A 30 scones/*botterbroodjies* = $\frac{30}{12}$ = 2,5 dozen/*dosyn* 1 dozen need 2 eggs/*1 dosyn benodig 2 eiers* 2,5 dozen/*dosyn* = 2,5× 2 = 5 eggs/*eiers* ✓ A	1A dozen = 12 1A simplification **OR/*OF*** 1A dozen = 12 1A simplification **OR/*OF*** 1A dozen = 12 1A simplification (2)	M L1
1.3.3	Radius = 7 cm ÷ 2 ✓ MA = 3,5 cm **OR/*OF*** 35 mm ✓ A	1MA dividing by 2 1A radius (2)	M L1
1.3.4	Number of dozen scones/*Getal dosyn botterbroodjies* $= \frac{500}{75}$ ✓MA = 6,67 ✓ S = 6 ✓ R	1MA dividing by 75 1S simplification 1R rounding down (3)	M L1
*1.3.5	✓ A ✓ A Ten minutes past two in the afternoon. *Tien minute oor twee in die namiddag.*	1A time 1A afternoon (2)	M L1
		[30]	

QUESTION/*VRAAG* 2 [32 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
2.1.1	14:00 ✓✓ A	2A 24-hour time format (2)	MP L1
2.1.2	8 ✓✓A	2A correct number (2)	MP L2
2.1.3	Bicycle/*Fiets* ✓✓RT	2RT bicycle (2)	MP L1
2.1.4(a)	Distance/*Afstand* = 9K + 1K = 10 km ✓✓ A Fraction/*Breuk* = $\frac{10}{42,2}$ ✓ MCA = $\frac{50}{211}$ ✓ CA **OR/*OF*** Distance/*Afstand* = 1 000 × 10 = 10 000 m ✓✓ A 42,2 km = 42 200 m Fraction/*Breuk* = $\frac{10\,000\,m}{42\,200\,m}$ ✓ MCA = $\frac{50}{211}$ ✓ CA	2A 10 km 1MCA correct order 1CA simplification **OR/*OF*** 2A 10 km 1MCA correct order 1CA simplification (4)	MP L2
2.1.4 (b)	✓✓ A The distance is less than a full marathon. *Die afstand is minder as 'n vol marathon.* **OR/*OF*** It is shorter than a standard marathon. *Dit is korter as 'n standaard marathon.* **OR/*OF*** It is a fraction of a full marathon. *Dit is 'n breuk van die vol marathon.*	2A explanation (2)	MP L4
2.1.5	B ✓✓ A **OR/*OF*** 0%	2A correct option (2)	P L2
2.2.1	Scout House/*Verkennerhuis* ✓✓RT	2RT correct place of interest (2)	MP L2
*2.2.2	South-east **OR** SE ✓✓A *Suidoos **OF** SO*	2A correct direction (2)	MP L1

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
*2.2.3	Nellmapius ✓✓RT	2RT correct street (2)	MP L2
2.2.4	St Martin's Church/ *St Martin-Kerk* ✓✓RT	2RT correct church (2)	MP L2
2.2.5	Irene Library &Hall/*Irene Biblioteek & Saal* ✓✓✓RT [Accept Hall /*Aanvaar Saal*]	3RT correct place (3)	MP L3
2.2.6	Measured distance/*Gemete afstand* = 8 cm ✓MA 8 cm : 1,9 km ✓MCA 8 cm : 190 000 cm ✓C Scale/*Skaal* is 1 : 23 750 ✓S 1 : 24 000 ✓R (Maximum distance/ *maksimum afstand)* Measured distance/*Gemete afstand* = 8,4cm ✓MA 8,4 cm : 1,9 km ✓MCA 8,4 cm : 190 000 cm ✓C Scale/*Skaal* is1 : 22 619,05 ✓S 1 : 23 000 ✓R **OR/*OF*** ✓MA ✓C 8,4cm ÷ 100 000 : 1,9 km ✓MCA 0,000084 km : 1,9km 1: 22 619 ✓S 1: 23 000 ✓R	1MA correct measurement 1MCA correct ratio 1C converting km to cm 1S simplified ratio 1R correct rounding **OR/*OF*** 1MA correct measurement 1C converting cm to km 1MCA correct ratio 1S simplified ratio 1R correct rounding **Provinces need to mark according to ± 1 mm of their provincial paper.** (5)	MP L3

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
2.2.7	The traffic flow is in the opposite direction. ✓✓O *Die verkeervloei in die teenoorgestelderigting.* **OR/*OF*** One-way traffic /The arrow shows you can only turn left. *Eenrigtingverkeer/ Die pyl wys jy kan slegs links draai* **OR/*OF*** The driver will be facing oncoming traffic. *Die bestuurder sal in aankomende verkeer inry.*	2O opinion (2)	MP L4
		[32]	

QUESTION/*VRAAG* 3[29MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
3.1.1	Total length/*Totale lengte* = 55 cm + 99 cm + 55cm = 209 cm ✓A Perimeter/*Omtrek*= 2(209 cm +149 cm) ✓SF = 2(358) cm = 716 cm ✓CA **OR/*OF*** Perimeter/*Omtrek* = (149 + 55 + 99 + 55 + 149 + 55 + 99 + 55) cm ✓A ✓SF = 716 cm ✓CA **OR/*OF*** Perimeter/*Omtrek* = 2 (149) cm + 2(55+99+55) cm ✓A ✓SF = (298 + 418) cm = 716 cm ✓CA	1A total length 1SF substitution 1CA perimeter **OR/*OF*** 1A total length 1SF substitution 1CA perimeter **OR/*OF*** 1A total length 1SF substitution 1CA perimeter (3)	M L2
3.1.2	Radius = $\frac{605}{2}$ = 302,5 mm ✓A = 30,25 cm ✓C Area/*Oppervlakte* = 3,142 × $(30{,}25\,\text{cm})^2$ ✓SF = 2 875,126375 cm^2 ✓CA **OR/*OF*** Radius = $\frac{605}{2}$ = 302,5 mm ✓A Area/*Oppervlakte* = 3,142 × $(302{,}5\,\text{mm})^2$ ✓SF = 28 512,6375 mm^2 = 28 751 263,75 ÷ 10^2 ✓C = 2 875,126375 cm^2 ✓CA	1A radius 1C conversion 1SF substitution 1CA simplification **OR/*OF*** 1A radius 1SF substitution 1C conversion 1CA simplification **NPR** (4)	M L2

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
3.1.3	$P = \frac{3}{7}$ ✓A ✓A $= 0,4285714286$ ✓CA **OR/*OF*** ✓M $P = 1 - \frac{4}{7} = \frac{3}{7}$ ✓A $= 0,4285714286$ ✓CA	1A numerator 1A denominator 1CA decimal form **OR/*OF*** 1M subtracting from 1 1A simplification 1CA decimal form **NPR** (3)	P L2
*3.2.1	Total area/*Totale oppervlakte* ✓M $= 4\text{ m} \times 5\text{ m} + 3\text{ m} \times 4\text{ m}$ ✓SF $= 20\text{ m}^2 + 12\text{ m}^2$ $= 32\text{ m}^2$	1SF substitution of correct values 1M adding **NPU** (2)	M L2
*3.2.2 TR	Area of 1 tile/*Opp van 1 teël* = 35 cm × 35 cm ✓SF $= 1\,225\text{ cm}^2$ $= 1\,225 \div (100)^2\text{ m}^2$ ✓C $=0,1225\text{ m}^2$ ✓CA Number of tiles needed/*Getal teëls nodig* $= \frac{32}{0,1225}$ ✓MCA $= 261,2244898$ ✓CA Number to add/*Getal om by te tel* ✓MCA $= 10\% \times 261,2244898 = 26,12244898$ Total number of tiles/*Totale aantal teëls* $= 261,2244898 + 26,12244898 = 287,3469388$ ✓CA Number of boxes/*Getal bokse* ✓MCA $= \frac{287,3469388}{4} = 71,83673469$ $\therefore$ 72 boxes ✓CA	1 SF substitution 1C conversion 1CA simplification 1MCA dividing areas 1CA simplification 1MCA calculation 10% 1CA simplification 1MCA dividing by 4 1CA rounding up 3 marks area of tile 2 marks number of tiles 2 marks adding 10% tiles or area 2 marks number of boxes	M L3

3.2.2	**OR (when rounding consistently up) */OF***	**OR/*OF***	
	Area of 1 tile/*Opp van 1 teël* = 35 cm × 35 cm ✓SF = 1 225 cm^2 = 1 225 ÷ $(100)^2$ m^2 ✓C =0,1225 m^2 ✓CA	1 SF substitution 1C conversion 1CA simplification	
	Number of tiles needed/*Getal teëls nodig* $= \frac{32}{0,1225}$ ✓MCA ✓CA = 261,2244898 ≈ 262	1MCA dividing areas 1CA simplification	
	Number to add/*Getal om by tetel* ✓MCA = 10% of 262 = 26,2	1MCA calculation 10%	
	Total number of tiles/*Totale aantal teëls* = 262 + 26,2 = 288,2 ≈ 289 ✓CA	1CA simplification	
	Number of boxes/*Getalbokse* = $\frac{289}{4}$ ✓MCA = 72,25 ∴ 73 boxes ✓CA	1MCA dividing by 4 1CA rounding up	
	OR/*OF* ✓C ✓SF ✓CA Area of 1 tile/*Opp van 1 teël* = $(0,35)^2$ = 0,1225 m^2	**OR/*OF*** 1C conversion 1 SF substitution	
	Area covered by tiles in a box/ *Opp. wat 'n boks teëls bedek* ✓MCA = 0,1225 m^2 × 4 = 0,49 m^2 ✓CA	1CA simplification 1MCA multiplying by 4 1CA simplification	
	Area to be tiled/*Opp wat geteël word* ✓MCA 32 × 110% = 35,2 ✓CA	1MCA calculation 10% 1CA simplification	
	Number of boxes needed/*Getal bokse nodig* $= \frac{35,2}{0,49}$ ✓MCA ≈ 71,8 ∴72 boxes ✓CA	1MCA dividing areas 1CA rounding up	

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF*	**OR/*OF***	
	Area of tile/ *Opp van 'n teël* = $(35\text{cm})^2$ $= 1\ 225\ \text{cm}^2$ ✓A	1A simplification	
	$32\ \text{m}^2 \times 100^2 = 320\ 000\ \text{cm}^2$ ✓A ✓C	1A factor 1C conversion	
	Number of tiles needed/ *Getal teëls nodig* $32\ \text{m}^2 = 320\ 000\ \text{cm}^2 \div 1\ 225\ \text{cm}^2$ ✓MCA $= 261{,}2244898$ ✓CA	1MCA dividing areas 1CA simplification	
	With extras/ *Met ekstras* $=261{,}2244898 \times 1{,}1$ ✓MCA $= 287{,}3 = 288$ tiles /*teëls* ✓CA	1MCA calculation 10% 1CA simplification	
	Number of boxes/ *Getal bokse*: $288 \div 4$ ✓MCA $= 72$ ✓CA	1MCA dividing by 4 1CA rounded up simplification	
	OR/*OF*	**OR/*OF***	
	Number of tiles/*Getal teëls* = 4 m ÷ 0,35 ≈ 11,428 ✓C ✓MCA ✓A Number of tiles/*Getal teëls* = 5 m ÷ 0,35 ≈ 14,2857	1C conversion 1MCA dividing dimensions 1A simplification	
	Total number of tiles for lounge *Totale getal teëls vir woonkamer* $= 11{,}4285 \times 14{,}285 = 163{,}2641$ ✓SF	1 SF substitution	
	Number of tiles/*Getal teëls* = 3 m ÷ 0.35 = 8,5714 Number of tiles/*Getal teëls* = 4 m ÷ 0,35 = 11,4285		
	Total number of tiles for dining *Totale getal teëls vir eetkamer* $= 11{,}4285 \times 8{,}5714 = 97{,}9582$		
	Total for lounge and dining room *Totaal vir woon en eetkamer* $= 163{,}2641 + 97{,}9582 = 261{,}22$ tiles ✓CA	1CA simplification	
	Including extra for cuttings and breakages/ *Insluitend ekstra vir sny en breek* $= 261{,}28 \times 110\%$ ✓MCA $= 287{,}408$ ✓CA	1MCA calculation 10% 1CA simplification	
	Total number of boxes/*Getal bokse* = 287,408..÷ 4 ✓MCA $= 71{,}852$ ≈ 72 ✓CA	1MCA dividing by 4 1CA rounding up (9)	

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
3.2.3 TR		**CA from Q3.2.2**	M/F L4
	Bags of tile cement/*Sakke teël sement* $= \frac{32}{3} = 10,7 \approx 11$ ✓A	1A number of bags of cement	
	Cost of the cement/*Sementkoste* ✓MCA ✓CA = R99,90 × 11 = R1 098,90	1MCA multiplying cost with number 1CA cement cost	
	Cost of the grout/*Koste van bryvulsel* = R89,90 × 4 = R359,60 ✓CA	1CA grout cost	
	Cost of the tiles/*Teëlkoste* = R143,84 × 72 = R10 356,48 ✓CA	1CA tile cost	
	Total cost/*Totalekoste* ✓MCA = R10 356,48 + R1 098,90 + R359,60 + R2 500 = R14 314,98 ✓CA	1MCA adding 4 values 1CA simplification	
	✓O Her budget is enough./*Haar begroting is genoeg.*	1O verification	
	OR/*OF*	**OR/*OF***	
	(using 73 boxes of tiles) Bags of tile cement/*Sakke teëlsement* $= \frac{32}{3} = 10,7 \approx 11$ ✓A	1A number of bags of cement	
	Cost (in rand)/*Koste in rand* ✓MCA = 143,84 × 73 + 99,90 × 11 + 89,90 × 4 + 2 500 ✓CA ✓CA ✓CA ✓MCA = R10 500,32 + R1 098,90 + R359,60 + R2 500 = R14 458,82 ✓CA	1MCA multiplying cost with number 1CA cement cost 1CA grout cost 1CA tile cost 1MCA adding 4 values 1CA simplification	
	✓O Her budget is enough./*Haar begroting is genoeg.*	1O verification	
	OR/*OF*	3 marks cement cost 1 mark tile cost 1 mark grout cost 2 marks adding costs 1 mark verification	

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF*	**OR/*OF***	
	Bags of tile cement/*Sakke sement* $\frac{32}{3} = 10,7 \approx 11$ ✓A	1A number of bags of cement	
	Budget verification/*Begroting verifikasie*: ✓MCA ✓CA ✓CA ✓CA R15 000 – [(R143,84 × 72) + (4 × R89,90) + (11 × R99,90) + R2 500] ✓MCA = R15 000 – (R10 356,46 + R359,60 + R1 098,90 + R2 500) = R15 000 – R14 314,98 = R685,02 ✓CA ✓O The budget is enough with R685,02 to spare *Die begroting is genoeg met R685,02 oorblywend.*	1MCA multiplying cost with number 1CA tile cost 1CA cement cost 1CA grout cost 1MCA adding 4 values 1CA simplification 1O verification (8)	
		[29]	

QUESTION/*VRAAG* 4 [30 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
*4.1.1	Right/*Regs* ✓✓RT	2RT correct direction (2)	MP L1
4.1.2 (a)	✓RT K 11 ✓RT	1RT correct row 1RT correct seat (2)	MP L2
*4.1.2 (b)	Total seats/*Totale sitplekke* = 10 + 16 × 5 + 19 + 21 = 130 ✓ A Ratio/*Verhouding* = 4 : 130 ✓ MCA = 2 : 65 ✓ CA **OR/*OF*** Total seats/*Totale sitplekke* = 64 + 66 (vacant) = 130 ✓ A Ratio/*Verhouding* = 4 : 130 ✓ MCA = 2 : 65 ✓ CA	1A total seats 1MCA ratio in correct order 1CA simplification **OR/*OF*** 1A total seats 1MCA ratio in correct order 1CA simplification (3)	MP L2
4.1.3	Total vacant seats/*Totale oop sitplekke* = 66 ✓ A Percentage income lost/*Persentasie inkomste verloor* $= \frac{66}{130} \times 100\%$ ✓ MCA = 50,76923077 ≈ 50,77 % ✓ CA **OR/*OF*** Percentage income from occupied seats *Persentasie inkomste van hierdie sitplekke* $= \frac{64}{130} \times 100\% \approx 49{,}23\%$ ✓ CA Income lost/*Verlore inkomste* = 100% – 49,23% ✓ MCA = 50,77% ✓ CA	**CA Q4.1.2 total seats** 1A total vacant seats 1MCA percentage calculation 1CA simplification **OR/*OF*** 1CA % occupied seats 1MCA subtracting from 100% 1CA simplification **NPR** (3)	MP L3

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
4.2.1	✓✓ O To allow air inside the tank to escape as the diesel is pumped in **OR** Release air bubbles formed **OR** To let air in **OR** To protect the tank from exploding or imploding *Om lug wat in die tenk is,uittelaat terwyl diesel ingepomp word* ***OF*** *Lugborrels vry te laat* ***OF*** *Om lug in te laat* ***OF*** *Om te keer dat die tenk ontplof of inplof.*	2O reason (2)	MP L4
4.2.2(a)	Inner diameter/*Binne-middellyn* ✓ A $= 3{,}22\text{ m} - 2\times\frac{5}{1\,000}\text{ m}$ ✓ C $= 3{,}21\text{ m}$ **OR/*OF*** ✓ A ✓ C $5\text{ mm} + 5\text{ mm} = \frac{10}{1000}\text{ m} = 0{,}01\text{ m}$ Inner Diameter $= 3{,}22 - 0{,}01$ m $= 3{,}21$ m	1A subtracting **double** the thickness 1C converting to m **OR/*OF*** 1A subtracting **double** the thickness 1C converting to m (2)	M L2
4.2.2 (b)	Inner height/*Binne hoogte* ✓ MA $= 7{,}25\text{ m} - 2\times\frac{5}{1\,000}\text{ m}$ $= 7{,}24$ m ✓ CA ✓ MCA Volume $= 3{,}142\times(\frac{3{,}21}{2})^2\times 7{,}24$ ✓ SF $= 3{,}142\times(1{,}605)^2\times 7{,}24$ $= 58{,}599622782\text{ m}^3$. ✓ CA Filling volume/*Opvul volume* $= 58{,}599622782\text{ m}^3\times 95\%$ ✓ MCA $= 55{,}6696416429\text{ m}^3$ ✓ CA Number of litres/*Hoeveelheid liter* $= 1\,000\times 55{,}6696416429\text{ m}^3$ $= 55\,669{,}64\ \ell$ ✓ C	1MA subtracting double the thickness 1CA simplification 1MCA finding radius 1SF correct values 1CA simplification 1MCA percentage finding 1CA capacity 1C to litres (8)	M L3

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
4.2.3	✓ MCA ✓ SF SA/*BO* = 2 × 3,142 × (1,61) × (1,61 + 7,25) ≈ 89,64 m^2 ✓ S Total area to be painted/*Totale oppervlakte om te verf* = 89,64 m^2 – 1 m^2 ✓ MCA = 88,64 m^2 . ✓CA ✓ MCA Litres needed/*Liter nodig* = 88,64 ÷ 3 = 29,55 ✓ CA Valid ✓ O **OR/*OF*** ✓ A ✓ SF SA/BO = 2 × 3,142 × (1,61) × (1,61 + 7,25) ≈ 89,64 m^2 ✓ S Surface Area = 89,64 m^2 – 1 m^2 ✓ MCA = 88,64 m^2 ✓CA Area that can be covered by 30 ℓ /*Opp wat met 30 ℓ geverf word* ✓ MA 30 litres × 3 = 90 m^2 ✓CA Less is needed/ *Minder word benodig* ✓ O	**CA from Q4.2.2** 1MCA correct radius 1SF substitution 1S simplification 1MCA subtracting 1 m^2 1CA simplification 1MCA dividing by 3 1CA simplification 1O verification **OR/*OF*** 1A correct radius 1SF substitution 1S simplification 1MCA subtracting 1 m^2 1CA simplification 1MA multiplying by 3 1CA simplification 1O verification (8)	M L4
		[30]	

QUESTION/*VRAAG* 5 [28 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
5.1.1	✓✓ RT Front view **OR** Back view **OR** Rear view *Vooraansig **OF** Agteraansig*	2RT view (2)	MP L1
5.1.2	Width of the bakkie/*Bakkie se breedte* = 1,86 m ✓ C 2D = 3,6 m – 1,86 m = 1,74 m ✓ MA D = $\frac{1,74}{2}$ m ✓ MCA = 0,87 m ✓ CA **OR/*OF*** Width of the garage/*Motorhuis se breedte* = 3 600 mm ✓ C 2D = 3 600 mm – 1 860 mm = 1 740 mm ✓ MA D = $\frac{1740}{2}$ mm ✓ MCA = 870 mm ✓ CA	1C conversion 1MA difference 1MCA dividing by 2 1CA simplification **OR/*OF*** 1C conversion 1MA difference 1MCA dividing by 2 1CA simplification (4)	M L2
5.1.3	Number of choices/*Getal keuses* = 4 × 2 ✓ MA = 8 ✓ CA	1MA multiplying 1CA number of choices. (2)	P L2
5.2.1	A map is drawn to scale while a strip chart is not. ✓✓A *'n Kaart word volgens skaal geteken terwyl 'n strook kaart nie.* **OR/*OF*** A map shows the routes in a winding manner while a stip chart shows them as straight lines. *'n Kaart toon die kronkelende roetes terwyl die strook kaart dit in reguitlyne wys.*	2A statement (2)	MP L1

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
*5.2.2	Distance/*Afstand* (Springbok to/*na* Gobabis) = 892 km + 203 km ✓ RT ✓ RT = 1 095 km ✓ CA	1RT correct 892 1RT adding 1CA distance in km (3)	MP L2
5.2.3	Noordoewer ✓✓RT	2RT correct town (2)	MP L2
5.2.4 (a)	Distance Mariental to Keetmanshoop *Afstand van Mariental na Keetmanshoop* = 644 – 427 ✓ RT = 217 km ✓ A Total distance travelled/*Totale afstand afgelê* = 140 km + 289 km + 217 km = 646 km. ✓ CA **OR/*OF*** Distance/ *Afstand* ✓ RT = 140 km + 289 km + (465 km – 248 km) = 140 km + 289 km + 217 km ✓ A = 646 km ✓ CA	1RT distances 1A simplification 1CA distance **OR/*OF*** 1RT distances 1A simplification 1CA distance (3)	MP L2

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
5.2.4 (b)	Time/*Tyd* 1 = 140 km ÷ 80 km/h = 1,75 hrs ✓ SF ✓ S Time /*Tyd* 2 = 289 km ÷ 80 km/h = 3,6125 hrs ✓ S Time/*Tyd* 3 = 217 km ÷ 120 km/h = 1,808333333 hrs ✓ S Stoppage time = 3 × 25 min = 75 min = 1,25 hrs ✓ S Travelling time including breaks = 1,75 + 3,6125 + 1,808333333 + 1,25 ✓ MCA = 8,420833333 hrs ✓CA = 8 h 25 ✓ C Travelling time = 12:25 – 04:00 ✓ MA = 8 h 25 ✓ A Letitia's statement is CORRECT/*KORREK* ✓ O **OR/*OF*** Total time taken/*Totale tydsduur* = 12:25 – 4:00 ✓ MA = 8 h 25 min ✓ A Driving time on gravel road/*Bestuurstyd op grondpad* = $\frac{429\ km}{80\ km/h}$ ✓ S ✓ SF = 5,3625 h ✓ S Driving time on tarred road/*Bestuurstyd op teerpad* = $\frac{217\ km}{120\ km/h}$ = 1,808333h ✓ S Total time/*Totale tyd* = 5,3265 h + 1,808 hr = 7,170833… hours/*uur* ✓ CA = 7 hours + 0,17083333 × 60 = 7 h 10 min ✓ C ∴ Total break time/*Totale rustyd* = 8 h 25 min – 7 h 10 min = 1 h 15 min ✓ CA Duration of breaks/*Rustye se duur* = 3 × 25 min = 75 min = 1h 15 min ✓A **OR/*OF*** Each break/*Elke rustyd* = $\frac{1h15\,min}{3}$ = 25 min Letitia is CORRECT/*KORREK* ✓ O **OR/*OF***	1SF substitution 1S simplification 1S simplification 1S simplification 1S simplification 1MCA adding time 1CA simplification 1C converting time 1MA subtracting 1A total travelling time 1O opinion **OR/*OF*** 1MA subtracting 1A total travelling time 1S total distance 1SF substitution 1S simplification 1S simplification 1CA simplification time 1C converting time 1CA simplification 1A break time 1O opinion **OR/*OF***	M L4

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
	✓ SF ✓ S Time/*Tyd* 1 = 140 km ÷ 80 km/h = 1h 45 min Time /*Tyd* 2 = 289 km ÷ 80 km/h = 3h 36 min ✓ S Time/*Tyd* 3 = 217 km ÷ 120 km/h = 1h 48 min ✓ S Travelling time/*Reis tyd* = 1h 45 min + 3h 36 min + 1h 48 min ✓ MCA = 7 h 9 min ✓CA Travelling time /*Reis tyd* = 12:25 – 04:00 ✓ MA = 8 h 25 min ✓ A ∴ Total break time/*Totale rustyd* = 8 h 25 min – 7 h 9 min = 1 h 16 min ✓ CA Each break/*Elke rustyd* $= \frac{1h16\,\text{min}}{3}$ ≈ 25 mins ✓ S Letitia's statement is CORRECT/*KORREK* ✓ O	1SF substitution 1S simplification 1S simplification 1S simplification 1MCA adding time 1CA simplification 1MA subtracting 1A traveling time 1CA simplification 1S break time 1O opinion (11)	
		[29]	

NOTES: MATHEMATICAL LITERACY PAPER 2	
Level 4 Questions: Calculations must be evident to award the conclusion/opinion mark. When rounding it must be correctly rounded to a minimum of 2 decimal places unless stated otherwise. On higher order (i.e level three to four multi-step calculations) questions no penalty for correct early rounding.	
QUESTION 1	
1.1.4	Accept: B
1.1.5	Accept: E or B
1.2.2	Accept **cubic centimeters** (i.e. **cm^3**) / Kubieke centimeter
1.2.4	**CA only apply if 1 value is correct**. That is, either 2 100 or 70 must have been used in a fraction for a ***max. 2 marks,*** on condition it is correctly simplified.
1.3.5	Accept, for ***full marks*** description: • Ten past two in the afternoon. /*Tien oor twee in die namiddag*. • Ten past two post meridian. / *Tien oor twee meridiaan* • Ten past two pm / *Tien oor twee nm*
QUESTION 2	
2.2.2	Accept East of South
2.2.3	Accept one of the following street names for full marks: • King. • Pioneer.
QUESTION 3	
3.2.1	Candidates need not show (20 + 12)m^2
3.2.2	**Full marks can be awarded for this solution:** **Lounge:** Length = 4m ÷ 0,35 = 11,428 ≈ 12 Width = 5m ÷ 0,35 = 14,285 = 15 ∴ Total tiles = 12 × 15 = 180 tiles **Dining:** Length = 4m ÷ 0,35 = 11,428 ≈ 12 Width = 3 ÷ 0,35 = 8,571 ≈ 9 ∴ Total tiles = 11 × 9 = 108 tiles Hence, total tiles needed = 180 + 108 = 288 Number to add = 288 × 1,1 = 316,8 ≈ 317 ∴ Number of boxes = 317 ÷ 4 = 79,25 ≈ 80 boxes

QUESTION 4	
4.1.1	Accept: • East / *Oos* or E / *O*
4.1.2 (b)	Accept, for full marks ratio given as: • 4:130 or $\frac{4}{130}$ However, if given **4:incorrect 2nd part**. Did not show how incorrect 2nd part was obtained can get max. 2 marks provided it is simplified correctly. Accept answer simplified into unit ratio.
QUESTION 5	
5.2.2	CA considered only if adding distance from strip chart other than 203km, then (max 2 marks).