basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

MATHEMATICAL LITERACY P2

MAY/JUNE 2024

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages an addendum with 6 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 3.2
   - ANNEXURE D for QUESTION 4.1
   - ANNEXURE E for QUESTION 4.2
   - ANNEXURE F for QUESTION 5.1

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 drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

QUESTION 1

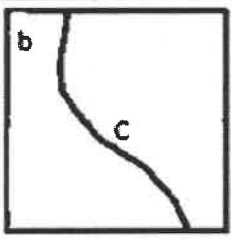
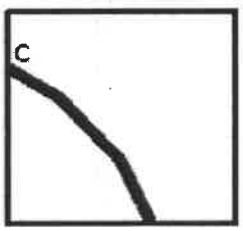
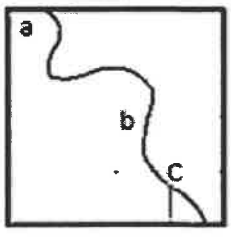
1.1 TABLE 1 below shows a list of explanations and definitions in COLUMN B, and mathematical terms and concepts in COLUMN A.

TABLE 1: TERMS AND CONCEPTS WITH EXPLANATIONS AND DEFINITIONS

COLUMN A	COLUMN B
1.1.1 Circumference	A time measurement equivalent to six hundred seconds
1.1.2 Probability	B the measuring of hotness or coldness
1.1.3 One hour	C the line from one end of a circle to the other end
1.1.4 Temperature	D equivalent to the mass of a person divided by the height squared
	E the boundary that surrounds a circular shape
	F time measurement equivalent to three thousand six hundred seconds
	G the likelihood that something might happen
	H a number showing the relationship between the distance on a map and the actual distance

Use TABLE 1 above and choose an explanation or definition from COLUMN B that matches the term or concept in COLUMN A. Write only the letter (A–H) next to the question numbers (1.1.1 to 1.1.4) in the ANSWER BOOK, e.g. 1.1.5 J. (8 x 1) (8)

1.2 The three sketches below represent the same portion of the physical world which is drawn using three different scales (A, B and C) in random order.

Sketch 1	Sketch 2	Sketch 3
		

The following scales (in random order) were used to draw these sketches:

A **1 : 100 000**
B **1 : 25 000**
C **1 : 50 000**

Use the information and sketches above to answer the questions that follow.

1.2.1 Name the type of scale used to draw the sketches above. (2)

1.2.2 Interpret the scale 1 : 50 000. (2)

1.2.3 Write down the scale that was used to draw Sketch 2. (2)

1.3 The picture below shows information boards (a traffic sign and distance information) and vehicles heading in a southerly direction.

The numbers displayed next to the names of the towns on the information board show the distance in kilometres from the information board to that town.

PICTURE OF INFORMATION BOARDS AND VEHICLES HEADING SOUTH

Use the information above to answer the questions that follow.

1.3.1 Give the shapes of the information boards. (2)

1.3.2 Write down the distance a motorist must still travel, in a northerly direction, to reach Bloemfontein. (2)

1.3.3 The 120 on the traffic sign board indicates 120 km/h.

Interpret 120 km/h in context. (2)

1.3.4 Determine the distance from Trompsburg to Johannesburg. (2)

1.3.5 State the general direction of Trompsburg from the information sign. (2)

1.3.6 The length of one of the road signs is 90 cm.

Convert this length to metres. (2)
[26]

QUESTION 2

2.1

ANNEXURE A shows the site map of the Bloem Agricultural Show and the entrance gates to the showgrounds.

The main exhibition halls are named Protea, Daisy, Tulip and Lily.

The Daisy Hall has a length of 65 m.

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

2.1.1 Write down the gate number for the main public entrance. (2)

2.1.2 State the maximum number of public parking areas available. (2)

2.1.3 Determine the number of gates used by vehicles. (2)

2.1.4 Write down only the letter that makes the following statement TRUE:

The probability of finding a gate on the eastern side of the site is …

A impossible.
B an even chance.
C certain. (2)

2.1.5 Give the general direction of Gate 12 from the Amusement Park. (2)

2.1.6 A layout plan will be drawn of this site map using a scale of 1 : 8 000.

Determine, rounded to the nearest mm, the length of the Daisy Hall on this layout plan. (4)

2.2

One of the exhibitors sells pedal go-karts for kids (see picture alongside), which requires parts to be assembled in order to ride the pedal go-kart.

ANNEXURE B shows assembly instructions arranged in two columns. In COLUMN A are written instructions arranged in order and in COLUMN B are visual instructions (pictures), not arranged in any specific order.

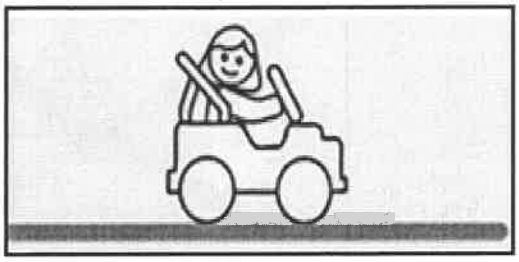
PICTURE OF A COMPLETED PEDAL GO-KART FOR KIDS

Use ANNEXURE B and the information above to answer the question that follows.

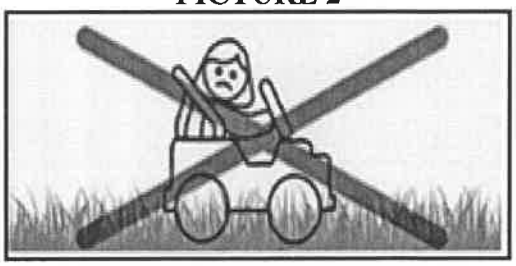
Choose a picture from COLUMN B that matches the written instruction in COLUMN A. Write only the letter (A–E) next to the question numbers (2.2.1 to 2.2.5), e.g. 2.2.6 F. (5 x 1) (5)

2.3 The pictures below illustrate safety instructions for using the pedal go-kart.

SAFETY INSTRUCTION: PICTURE 1



SAFETY INSTRUCTION: PICTURE 2



Write down an explanation for ONE of the safety instructions illustrated in the pictures above. (2)

2.4 TABLE 2 below shows the number of horses, small livestock and cattle from the Free State, Gauteng and other provinces on display at the Bloem Agricultural Show. One value (**X**) has been omitted.

TABLE 2: THE NUMBER OF HORSES, SMALL LIVESTOCK AND CATTLE ON DISPLAY FROM VARIOUS PROVINCES

PROVINCES	HORSES	SMALL LIVESTOCK	CATTLE	TOTAL
Free State	612	1 476	363	**2 451**
Gauteng	163	**X**	62	**565**
Other	585	1 024	371	**1 980**
TOTAL	**1 360**	**2 840**	**796**	**4 996**

[Adapted from Bloemshow/factsheet.pdf]

Use TABLE 2 to answer the questions that follow.

2.4.1 Determine missing value **X**. (2)

2.4.2 Write down, in simplified fractional form, the probability of NOT randomly selecting a horse from the total number of animals shown in TABLE 2 above. (3)

2.4.3 A farmer visits the display where all the cattle are kept. He is specifically interested in purchasing cattle from the Free State.

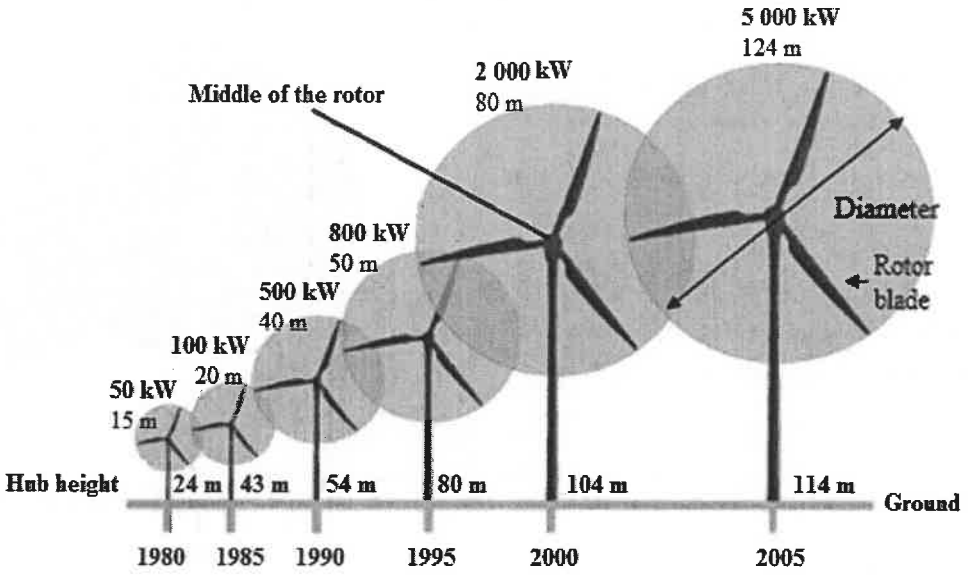
Calculate, as a percentage, the probability of the farmer randomly selecting cattle from the Free State. (3)
[29]

QUESTION 3

3.1 Wind turbines are used as an alternative way to generate electricity.

The picture below shows how the size of the wind turbine and the generation capacity has changed from 1980 to 2005.

PICTURES OF WIND TURBINES AND GENERATION CAPACITY USED FROM 1980 to 2005



NOTE:
Hub height = distance from the ground to the middle of the wind turbine's rotor

5 000 kW: Power generation of 5 000 kilowatt
124 m: Diameter of the circle made by the rotor blades of the wind turbine = 124 m

Area of a circle = 3,142 × radius^2

Use the information above to answer the questions that follow.

3.1.1 Write down the amount of power generated by the wind turbine with the second-tallest hub height. (2)

3.1.2 Give ONE possible reason why the rotor blade size of the wind turbine from 2005 is larger than the rotor blade size of the wind turbine from 1980. (2)

3.1.3 Calculate, in metres, the maximum height that the tip of the rotor blade of the tallest wind turbine can reach as it turns. (3)

3.1.4 Anam says that the area covered by the rotor blade of the tallest wind turbine in motion is 12 077,748 m^2.

Verify, with calculations, whether or not her statement is VALID. (4)

3.1.5 Determine the percentage increase in power generation from 1995 to 2005. (4)

3.1.6 Give ONE other possible source of generating electricity that can be used in South Africa. (2)

3.2 A completed rectangular-based compost box is made up of three sections sharing some common panel boards. The sections are assembled by slotting panel boards into panel posts.

ANNEXURE C shows a rectangular compost box linking sections A, B and C with some common panel boards.

Some dimensions of the compost box are also shown.

You may use the following formulae, where applicable:

Perimeter of a rectangle = 2 × (length + width)

Volume = length × width × height

1 m^3 = 1 000 litres

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

3.2.1 Calculate the perimeter of the base of the compost box. (4)

3.2.2
- First, the boxes of Section A and Section C were completely assembled.
- The box in Section B fits in between Section A and Section C.
- Section B has fewer front panel boards than the back and shares side panel boards with Section A and Section C, as shown on ANNEXURE C.

Determine how many additional panel boards are required to completely assemble the box in Section B. (3)

3.2.3 The maximum height of the decomposing compost matter in each section, C : B : A, is in the ratio 3 : 5 : 7.

Determine, in litres, the total capacity for the decomposing matter in Section A and Section B. (6)

3.3 If the temperature rises above 70 °C, the compost will sterilise itself (kill the good micro-organisms).

Convert this temperature to degrees Fahrenheit.

Use the formula: $°C = \frac{5}{9} \times (°F - 32°)$ (3)

[33]

QUESTION 4

4.1 Anda is a teacher in Zambia. ANNEXURE D shows a detailed layout plan of the school building where he teaches.

Use the information in ANNEXURE D to answer the questions that follow.

4.1.1 Write down, in simplified form, the ratio of the number of single doors to the number of double doors on the school layout plan. (3)

4.1.2 Name the rooms that have TWO double doors and ONE single door. (3)

4.1.3 State ONE feature that indicates that the school has more than one level. (2)

4.1.4 During an evacuation drill, Anda took the following route:

- Exited the room and turned left into the hallway
- Went straight past three single doors on the left and a fire extinguisher on the right
- Turned right at the end of that hallway
- Passed two rooms each having a double door
- Then used the 'Exit to use in case of fire'

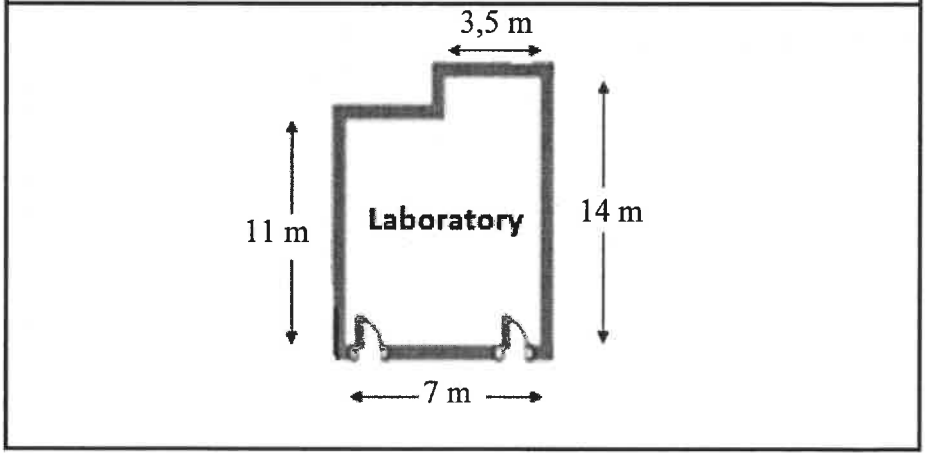
Determine the room from which Anda exited during the evacuation drill. (3)

4.1.5 The laboratory floor needs to be re-tiled.

The dimensions of the tiles that will be used are: 600 mm × 600 mm. There are five tiles in a box.

The sketch and inner dimensions of the laboratory floor are below.

INNER DIMENSIONS OF THE LABORATORY FLOOR



The science teacher claimed that they would need a minimum of 40 boxes of tiles to tile the laboratory floor if cutting and breakages are ignored.

Verify, showing ALL calculations, if his claim is VALID.

Use the formula: **Area of a rectangle = length × width** (10)

4.2 Anda uses the strip map in ANNEXURE E to plan his travels.

ANNEXURE E shows the strip map of roads connecting Zambia to South Africa.

Use the information in ANNEXURE E to answer the questions that follow.

4.2.1 Write down the total number of countries shown on the strip map. (2)

4.2.2 Name the town that is 403 km from Bulawayo. (2)

4.2.3 Anda travelled from Victoria Falls to Bulawayo. He had to pick up a friend from Hwange N.P. before reaching Bulawayo. Anda left Victoria Falls at 09:55 and travelled at an average speed of 97 km/h to Hwange N.P.

(a) Determine, to the nearest minute, at what time he reached his friend.

You may use the formula: **Speed = distance ÷ time** (5)

(b) Calculate the total distance he travelled from Victoria Falls to Bulawayo. (3)

[33]

QUESTION 5

5.1 Bontle owns a four-storey building with eight similar apartments, which she rents out.

ANNEXURE F shows the layout plan of the ground floor of the four-storey building showing two apartments.

PICTURE OF THE FRONT OF THE APARTMENT BUILDING

The total exterior length of the building is 58 feet.

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

5.1.1 Write down the number of enclosed balconies in this building. (2)

5.1.2 Calculate, in feet, missing value **A** on the layout plan. (5)

5.1.3 Give ONE valid reason why Bontle stated that the apartments are open-plan living. (2)

5.1.4 Identify the name of ONE common feature found in each of the bathrooms. (2)

5.1.5 One of the apartment entrance doors has 3B as a number.

Give a possible interpretation of this number. (2)

5.1.6 Bontle calculated the exterior length of the building to be 17,6784 m.

(a) Determine, rounded to THREE decimal places, the conversion factor she used in the form **1 m = … feet**. (3)

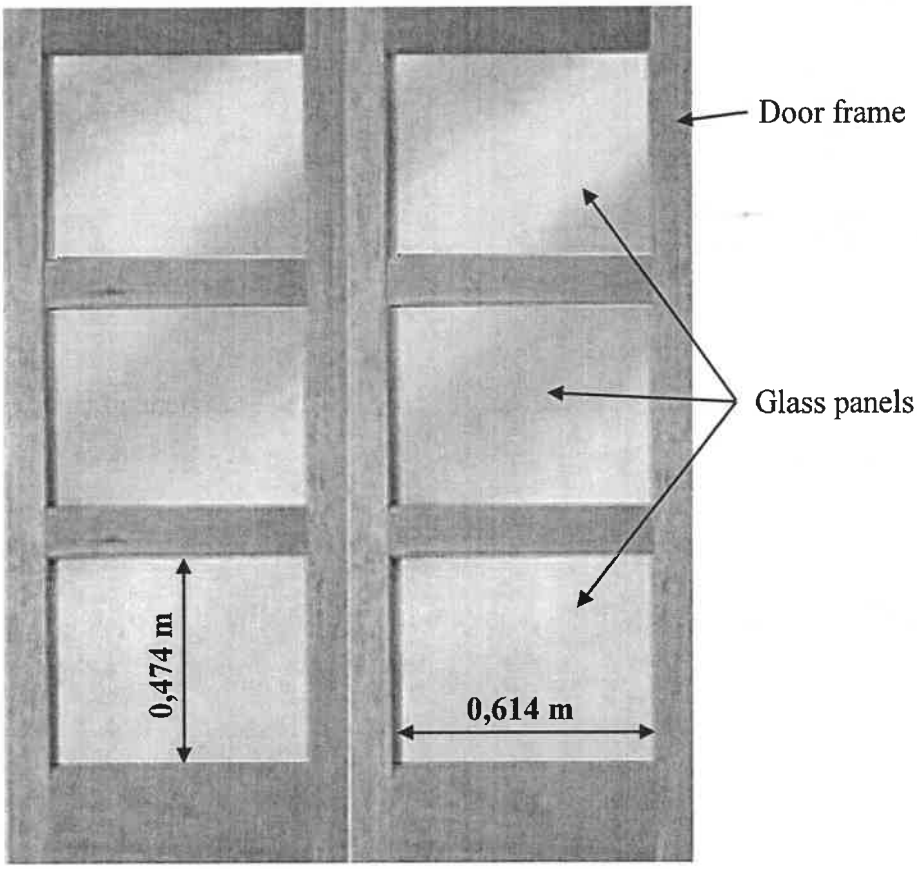
(b) Hence, convert to metres the exterior width of the building. (3)

5.2 The entrance door of the apartment building is a double door with six equally sized glass panels.

Bontle wants to replace all the glass panels with laminated safety glass. She received the following information:

- Mass of the safety glass is 15 kg per m^2
- Price of the safety glass is R490 per m^2
- Delivery charge is R820 for the first 20 kilograms, and thereafter R53,50 per kg, or part thereof
- Consider only the inner measurements for glass panels (ignore overlaps)

PICTURE OF THE ENTRANCE DOOR WITH INNER DIMENSIONS OF THE ORIGINAL GLASS PANELS



You may use the formula: **Area of a rectangle = length × width**

5.2.1 Calculate, rounded to ONE decimal place, the area of ONE glass panel. (2)

5.2.2 Bontle stated that it will cost her less than R2 000 for the purchase and delivery of all the safety glass panels for the double door.

Verify, showing ALL calculations, whether her statement is VALID. (8)
[29]

TOTAL: 150

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS
SENIORSERTIFIKAAT-EKSAMEN/
NASIONALE SENIORSERTIFIKAAT-EKSAMEN

MATHEMATICAL LITERACY P2/
WISKUNDIGE GELETTERDHEID V2

MAY/JUNE/*MEI/JUNIE* 2024

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

Symbol/*Kode*	**Explanation/*Verduideliking***
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/a graph/document/diagram/*Lees vanaf tabel/grafiek/diagram*
SF	Correct substitution in a formula/*Korrekte vervanging in formule*
O	Opinion/Explanation/Reasoning /*Opinie/Verduideliking/Redenasie*
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*
NPU	No penalty for omitting correct unit/*Geen penalisasie vir die uitlos van die korrekte eenheid nie*
AO	Answer only/*Slegs antwoord*
MCA	Method with constant accuracy/*Metode met volgehoue akkuraatheid*
RCA	Rounding consistent with accuracy/*Afronding met volgehoue akkuraatheid*

These marking guidelines consist of 20 pages.
Hierdie nasienriglyne bestaan uit 20 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 did NOT redo 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 or 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.
- A conclusion mark can only be given if relevant calculations precede it (at least 1 mark before conclusion).
- Rounding is an independent mark.
- No penalty for rounding (NPR) if the first decimal is correct, except questions involving money.

LET WEL:
- *As 'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.*
- *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 egter op by die tweede berekeningsfout of afbreuk 'break down' nie*
- *Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart geneem 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, dat die kandidaat slegs een punt verloor*
- *'n Gevolgtrekkingspunt kan slegs gegee word indien relevante berekeninge dit voorgaan (ten minste een punt voor die gevolgtrekking).*
- *Afronding tel as 'n onafhanklike punt.*
- *Geen penalisering vir ronding (NPR) as die eerste desimaal korrek is nie, behalwe as vrae geld insluit.*

QUESTION/*VRAAG* 1 [26 MARKS/*PUNTE*] Answer Only AO - full marks			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
1.1*	1.1.1 E ✓✓A 1.1.2 G ✓✓A 1.1.3 F ✓✓A 1.1.4 B ✓✓A	2A correct option 2A correct option 2A correct option 2A correct option (8)	M L1 P L1 M L1 M L1
1.2.1	✓✓ A Numerical /Number/ ratio scale. *Numeriese- / Nommer- /Getalle- /syfer-/verhouding-skaal*.	2A type of scale (2)	MP L1 E
1.2.2	✓ ✓ A 1 unit on the map is equivalent to 50 000 units in real life. *1 eenheid op die kaart is gelykstaande aan 50 000 eenhede in werklikheid* **OR/*OF*** The map is 50 000 times smaller than real life. *Die kaart is 50 000 keer kleiner as werklikheid*	2A relationship (2)	MP L1 M

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
1.2.3*	1: 25 000 ✓✓ A	2A correct scale (Accept B) (2)	MP L1 E
1.3.1*	✓A ✓A Rectangle and a circle. *Reghoek en 'n sirkel*	1A rectangle 1A circle (2)	M L1 E
1.3.2	✓✓A 144 km	2A correct answer Accept 144 (2)	MP L1 E
1.3.3*	It is the maximum speed a motorist can travel on the road. ✓✓A *Dit is die maksimum spoed wat 'n motoris mag ry op die pad.* **OR/*OF*** The motorist can cover a distance of 120 km in 1 hour. *Die motoris kan 120 km aflê in 1 uur*	2A correct explanation. (2)	MP L1 M
1.3.4*	Distance/*Afstand* (Jhb – Trompsburg) = 534 – 27 ✓ RT = 507 km ✓ A	1RT both correct values 1A distance **NPU** (2)	M L1 M
1.3.5	North /N/*Noord / N* ✓✓A	2A correct direction (2)	MP L1 E
1.3.6	$\frac{90\ cm}{100}$ ✓MA = 0,9 m ✓A	1MA dividing by 100 1A simplification (2)	M L1 E
			[26]

QUESTION/*VRAAG* 2 [29 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
2.1.1	2 ✓✓A	2A correct number (2)	MP L1 E
2.1.2	6 ✓✓A	2A correct road (2)	MP L1 M
2.1.3*	7 ✓✓A	2A correct number (2)	MP L1 E
2.1.4*	**C** ✓✓A	2A correct choice (2)	P L2 M
2.1.5	South East (SE) / *Suidoos (SO)* ✓✓A	2A correct direction (2)	MP L2 M
2.1.6	Length / *Lengte* = 65 m = 65 000 mm ✓C Scale/ *Skaal*: 1 : 8 000 n : 65 000 n = $\frac{65\,000}{8\,000}$ ✓ MA = 8,125 mm ✓CA ≈ 8 mm ✓R **OR/*OF*** Scale/*Skaal*: 1 : 8 000 n : 65 n = $\frac{65}{8\,000}$ ✓ MA = 0,008125 m ✓CA = 8,125 mm ✓C ≈ 8 mm ✓R	1C conversion 1MA dividing 1CA simplification 1R rounding **OR/*OF*** 1MA dividing 1CA simplification 1C conversion 1R rounding (4)	MP L3 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
2.2*	2.2.1 C ✓A 2.2.2 E ✓A 2.2.3 D ✓A 2.2.4 B ✓A 2.2.5 A ✓A	5A correct order (5)	MP L2 M
2.3*	✓✓O Only use the go cart on level ground. / smooth, flat, hard, tarred, road surface *Gebruik die knortjor slegs op gelyke grond/ gladde , plat, harde, pad, geteerde oppervlakte* **OR/*OF*** Do not use the vehicle on a long grassy surface. *Moet nie in lang gras ry nie.*	2O Explanation for 1st picture **or** for 2nd picture (2)	MP L4 E
2.4.1	✓MA X = 2 840 – 1 476 – 1 024 = 340 ✓CA **OR/*OF*** ✓MA X = 565 – 163 – 62 = 340 ✓CA	1MA subtracting from total 1CA simplification AO (2)	P L1 E
2.4.2	$P_{(\text{not a horse})} = \frac{2\,840+796}{4\,996}$ ✓RT ✓RT $= \frac{3\,636}{4\,996}$ $= \frac{909}{1\,249}$ ✓A **OR/*OF*** $P_{(\text{horse})} = \frac{1\,360}{4\,996}$ ✓RT $P_{(\text{not a horse})} = 1 - \frac{1\,360}{4\,996}$ ✓MCA $= \frac{909}{1\,249}$ ✓A	1RT numerator 1RT denominator 1A simplification **OR/*OF*** 1RT both values 1MCA subtracting from 1 1A simplification (3)	P L2 M
2.4.3	✓RT $P = \frac{363}{796} \times 100\%$ ✓RT = 45,60301508 % ✓CA	1RT 1st value 1RT 2nd value correctly place 1CA simplification **NPR** (3)	P L3 M
			[29]

QUESTION/*VRAAG* 3 [33 MARKS/*PUNTE*]]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
3.1.1	2 000 kW ✓✓RT	2RT correct kW NPU (2)	M L1 E
3.1.2	✓✓O To allow rotor blade to produce more energy. *Om met die rotorlem meer energie op te wek.* **OR/*OF*** Advanced technology to have material that can allow a big structure to stand firm on the ground. *Verbeterde tegnologie om materiaal te hê wat toelaat dat so 'n groot struktuur standvastig kan staan* **OR/*OF*** Larger rotor diameters allow wind turbines to sweep more area, capture more wind and produce more electricity *Groter rotormiddellyne laat die windturbines 'n groter area dek, meer wind vang en so meer krag opwek* **OR/*OF*** Demand for electricity increased/ demand for cleaner electricity *Verhoogde aanvraag vir elektrisiteit/ aanvraag vir skoner elektisiteit*	2O reason (more electricity) (2)	M L4 E
3.1.3	Max. height (in m) = Poles height + radius of rotor *Maks. Hoogte (in m) = Paal hoogte + radius van rotor* ✓ RT $= 114 + \frac{124}{2}$ ✓MA $= 114 + 62$ $= 176$ ✓CA **OR/*OF*** Pole + rotor/ *Paal + rotor* =124 + 114 ✓ RT = 238 Maximum height /*Maksimum hoogte* in m = 238 – (124÷2) ✓MA = 238 – 62 = 176 ✓CA	1RT both correct values 1MA divide by 2 to determine the radius 1CA simplification **OR/*OF*** 1RT both correct values 1MA divide by 2 to determine the radius 1CA simplification **AO** (3)	M L2 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
3.1.4*	Radius = $\frac{124}{2}$ = 62 ✓ A Area /*Oppervlakte* = 3,142 × $(62)^2$ ✓ SF = 12 077,848 m^2 ✓ CA ✓ O Not valid. / *Nie geldig nie*	1A radius 1SF substitution squared 1CA simplification 1O invalid (4)	M L4 M
3.1.5	✓ RT % increase/*verhoging* = $\frac{5\,000 - 800}{800} \times 100\%$ ✓ MA ✓ A = 525 % ✓CA **OR/*OF*** Current percentage / *Huidige persentasie* ✓RT =$\frac{5\,000}{800} \times 100\%$ ✓A = 625% % increase/*verhoging* 625% – 100% ✓ MA = 525 % ✓CA	1RT 1st correct value 1A denominator 1MA percentage 1CA simplification **OR/*OF*** 1RT 1st correct value 1A denominator 1MA percentage difference 1CA simplification (4)	M L2 M
3.1.6*	✓✓ A Generators **OR** solar power **OR** hydro-power **OR** nuclear power *Kragopwekkers **OF** sonkrag **OF** hidro-elektrisiteit **OF** kernkrag*	2A source (2)	M L1 E
3.2.1	✓ RT ✓ SF Perimeter/*Omtrek* = 2 × (2,3 + 2,3 + 2,3 + 3) m ✓ MA = 2 × (6,9 + 3) m = 19,8 m ✓ CA **OR/*OF*** Perimeter/*Omtrek* ✓ RT ✓ SF = 3 + 2,3 + 2,3 + 2,3 + 3 + 2,3 + 2,3 + 2,3 m ✓MA = 19,8 m ✓CA	1RT correct values 1SF substitution 1MA 6,9 1CA answer **OR/*OF*** 1RT correct values 1SF substitution 1MA 6,9 1CA answer (4)	M L2 E
3.2.2*	✓RT ✓ A 5 + 7 + 4 = 16 boards /*planke* ✓CA	1RT correct numbers 5 and 7 1A on 4 1CA simplification adding **AO** (3)	M L3 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
3.2.3	Height /*hoogte* B= $\frac{5}{7}$ × 0,5 m = 0,3571428571 m ✓ A	1A height box B	M L3 D
	Vol B = (2,3 × 3 × 0,3571428571)m^3 = 2,464285714m^3 ✓ CA	1CA volume of B box	
	Vol A = (2,3 × 3 × 0,5) m^3 ✓ SF = 3,45m^3 ✓ A	1SF volume of A box 1A simplification 3,45	
	Total/*Totaal* = 2,4642514m^3 + 3,45m^3 = 5,914285714m^3 ✓ CA	CA total volume	
	Capacity / *Kapasiteit* = 1 000 × 5,914285714 = 5 914,285714 litres. ✓ CA	1CA answer in litres	
	OR/*OF*	**OR/*OF***	
	Height of section B/ *Hoogte van boks B* = $\frac{5}{7}$ × 0,5 m = 0,3571428571 m ✓ A	1A height box B	
	Vol = (length×width×height) + (length×width×height) ✓ SF = (2,3 m × 3 m × 0,357… m) + (2,3 × 3 m × 0,5 m) ✓ CA ✓ A = (2,464285714 + 3,45) m^3. ✓ CA = 5,914285714 m^3	1SF volume of A box 1CA volume of B box 1A 3,45m^3 1CA total volume	
	Capacity / *Kapasiteit* = 1 000 × 5,914285714 = 5 914,285714 litres. ✓ CA	1CA answer in litres	
	OR/*OF*	**OR/*OF***	
	Volume A = length × width × height/ *lengte* × *breedte* ×*hoogte* = (3 m × 2,3 m× 0,5 m) ✓SF = 3,45 m^3 ✓A ∴ 3 450 litres ✓C	1SF volume of A box 1A simplification 3,45 1C conversion	
	Volume B = $\frac{3\,450\,\ell}{7}$ × 5 ✓A	1A ratio	
	= 2 464,285714 litres ✓CA	1CA volume box B	
	∴ $Total$ = 3 450 + 2 464,285714 = 5 914,285714ℓ ✓ CA	1CA answer in litres **NPR** (6)	

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
3.3*	$^{o}C = \frac{5}{9} \times (^{o}F - 32^{o})$ ✓ SF $70° = \frac{5}{9} \times (^{o}F - 32^{o})$ $70° \times \frac{9}{5} = °F - 32$ ✓ MA $126° = °F - 32$ $°F = 158$ ✓ CA	1SF substituting in formula 1MA changing subject 1CA answer (3)	M L2 M
		[33]	

QUESTION/*VRAAG* 4 [33 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
4.1.1	✓RT ✓RT 30 : 6 = 5 : 1 ✓A	1RT 30 1RT 6 1A simplification (3)	MP L2 E
4.1.2	✓✓A ✓A Reading room and computer lab *Leeskamer en rekenaarlokaal*	2A 1st room 1A second room (3)	MP L1 E
4.1.3	✓✓A Stairs / *trappe*	2A stairs (2)	MP L2 E
4.1.4	✓✓A ✓A Multi-media room 1 / *Multi-mediakamer 1*	2A correct room 1A correct number (3)	MP L3 M
4.1.5	Area/ *Opp* A = length × width /*lengte* × *breedte* = 11 m × 3,5 m ✓SF = 38,5 m^2 ✓ MCA Area/ *Opp* B = length × width /*lengte* × *breedte* = 14 m × 3,5 m = 49 m^2 ✓ MA Floor area/*Vloer opp*. = 38,5 m^2 + 49 m^2 = 87,5 m^2 ✓ MCA Area of tile = length × width *Opp van teël = lengte* × *breedte* = 600 mm × 600 mm = 360 000 mm^2 ✓ A ∴ $\frac{360\,000}{1000\,000}$ = 0,36 m^2 ✓C Number of tiles/*Getal teëls* = $\frac{87,5}{0,36}$ ✓ MCA ≈ 243,056 tiles✓ CA Number of boxes/ G*etal bokse* = $\frac{244}{5}$ = 48,8 = 49 ✓ CA INVALID/ *ONGELDIG*. ✓ O **OR/*OF*** ✓ SF ✓ MA ✓ A Floor Area/*vloeropp* = 11m ×7 m + 3,5 m × 3 m = 77 m^2 + 10,5 m^2 = 87,5 m^2 ✓ CA	1SF substitution 1MCA simplification 1MA simplification 1MCA simplification total area 1A area tile 1C conversion 1MCA dividing 1CA number of tiles 1CA number of boxes 1O opinion **OR/*OF*** 1SF substitution 1MA adding areas 1A 3 1CA area	M L4 D

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	Tiles /*Teëls* = $\frac{600\text{ mm}}{1000}$ = 0,6 m ✓ C Area of a tile / *Opp van teël* = 0,6 m × 0,6 m = 0,36 m^2 ✓ MCA Number of tiles/*Getal teëls* = $\frac{87,5}{0,36}$ ✓ MCA ≈ 243,056 tiles ✓ CA Number of boxes/ G*etal bokse* = $\frac{244}{5}$ = 48,8 = 49 ✓ CA INVALID/ *ONGELDIG*. ✓ O **OR/*OF*** ✓ SF ✓ A Floor Area/ *Vloer opp* = 11m ×7 m + 3,5 m × 3 m = 77 m^2 + 10,5 m^2 ✓ MA = 87,5 m^2 ✓ CA Tiles / *Teëls* = $\frac{600\text{ mm}}{1000}$ = 0,6 m ✓ C Area of a tile / *Opp van 'n teël* = 0,6 m × 0,6 m = 0,36 m^2 ✓ MCA Number of tiles / *Getal teëls* = $\frac{87,5}{0,36}$ ✓ MCA ✓ CA ≈ 243,056 tiles tiles in 40 boxes / *teels in 40 bokse* = 40 × 5 = 200 40 boxes is not enough or 200 < 244 ✓ CA *40 bokse is nie genoeg nie of 200 < 244* INVALID./ *ONGELDIG* ✓ O **OR/*OF*** ✓ SF ✓A Floor Area/*vloeropp* = 14m ×7 m – 3,5 m × 3 m = 98 m^2 – 10,5 m^2 ✓ MA = 87,5 m^2 ✓ CA Tiles /*Teëls* = $\frac{600\text{ mm}}{1\,000}$ = 0,6 m ✓ C Area of a tile / *Opp van teël* = 0,6 m × 0,6 m = 0,36 m^2 ✓ MCA Number of tiles/*Getal teëls* = $\frac{87,5}{0,36}$ ✓ MCA ≈ 243,056 tiles ✓ CA Number of boxes/ G*etal bokse* = $\frac{244}{5}$ = 48,8 = 49 ✓ CA INVALID/ *ONGELDIG*. ✓ O	1C conversion 1MCA area of tile 1MCA dividing areas 1CA number of tiles 1CA number of boxes 1O conclusion **OR/*OF*** 1A 3 1SF substitution 1MA adding areas 1CA area 1C conversion 1MCA area of tile 1MCA dividing areas 1CA number of tiles 1CA less than 1O conclusion **OR/*OF*** 1A 3 1SF substitution 1MA subtracting areas 1CA area 1C conversion 1MCA area of tile 1MCA dividing areas 1CA number of tiles 1CA number of boxes 1O conclusion	

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF*	**OR/*OF***	
	Area A = length × width/ *lengte* × *breedte* = 11 m × 3,5 m ✓SF = 38,5 m^2 ✓ MCA	1SF substitution 1MCA simplification	
	Area B = length × width/ *lengte* × *breedte* = 14 m × 3,5 m = 49 m^2 ✓ MCA	1MCA simplification	
	Floor area/*Vloer opp*. = 38,5 m^2 + 49 m^2 = 87,5 m^2 ✓ MCA	1MCA simplification total area	
	Area of tile = length × width / *Opp van teël*= *l* × *b* = 600 mm × 600 mm = 360 000 mm^2 ✓ A	1A area tile	
	∴ $\frac{360\,000}{1000\,000}$ = 0,36 m^2 ✓C	1C conversion	
	Number of tiles/*Getal teëls* = $\frac{87,5}{0,36}$ ✓ MCA ≈ 243,056 tiles ✓ CA	1MCA dividing 1CA number of tiles	
	Number of boxes/ G*etal bokse* = $\frac{244}{5}$ = 48,8 = 49 ✓ CA	1CA number of boxes	
	INVALID/ *ONGELDIG*. ✓ O	1O opinion	
	OR/*OF*	**OR/*OF***	
	Area of tile / *Opp van teël* = 600 mm × 600 mm = 360 000 mm^2 ✓A	1A area tile	
	L = 14 m × 1 000 = 14 000 mm ✓C	1C conversion	
	B = 7 m × 1 000 = 7 000 mm		
	∴ $Area/Opp = 14\,000\,mm \times 7\,000\,mm$ ✓SF = 98 000 000 mm^2 ✓ MCA	1SF substitution 1MCA simplification	
	∴ $Area/Opp = 3\,500\,mm \times 3\,000\,mm$ = 10 500 000 mm^2 ✓ MCA	1MCA simplification	
	Total area/ *Totale opp* = 98 000 000 mm^2 – 10 500 000 mm^2 = 87 500 000 mm^2 ✓MCA	1MCA simplification total area	

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	Number of tiles/*Aantal teëls* $= \frac{87\ 500\ 000\ mm^2}{360\ 000\ mm^2}$ ✓MCA = 243,0555556 tiles ✓CA Number of boxes/*Getal bokse* $= \frac{243,0555556}{5}$ = 48,61 ≈ 49 ✓CA ∴ INVALID/*ONGELDIG* ✓O **OR/*OF*** ✓SF ✓ A Area (Lab) = $(7 \times 14 - 3 \times 3.5)\ m^2$ = (98 – 10,5) m^2 ✓MA = 87,5 m^2 ✓ MCA Tile side / *Teël sy* = 600 ÷ 1 000 = 0,6 m ✓ C Area covered by a box of tiles *Oppervlakte bedek deur 'n boks teëls* = (0,6 × 0,6) × 5 ✓MCA = 1,8 m^2 ✓ CA Number of boxes / *Getal bokse* $= \frac{87,5}{1,8}$ ✓ MCA = 48,6 ≈ 49 ✓ CA INVALID / *ONGELDIG* ✓ O **OR/OF** Calculating 3 areas/*Berekening 3 opp*. A1 = 3,5 ×11 ✓SF = 38,5m^2 A2 = 3 × 3,5 ✓ A =10.5m^2 A3 = 3,5 × 11 = 38.5m^2 TOTAL =38,5m^2+10,5m^2+38,5m^2 ✓MA =8 7,5m^2 ✓MCA Number of tiles/*Getal teëls* = $\frac{87,5}{0,36}$ ✓ MCA ≈ 243,056 tiles✓ CA Number of boxes/ G*etal bokse* = $\frac{244}{5}$ = 48,8 = 49 ✓ CA INVALID/ *ONGELDIG* ✓ O	1MCA dividing 1CA number of tiles 1CA number of boxes 1O opinion **OR/*OF*** 1A 3 1SF substitution 1MA subtracting 1MCA simplification total area 1C conversion 1MCA area of 1 tile 1CA area box of tiles 1MCA dividing 1CA number of boxes of tiles 1O opinion **OR/*OF*** 1SF substitution 1A 3 1MA adding 1MCA simplification total area 1MCA dividing 1CA number of tiles 1CA number of boxes 1O opinion (10)	

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
4.2.1*	4 ✓✓ A	2A number of countries (2)	MP L1 E
4.2.2	Harare ✓✓ A	2A correct town (2)	MP L1 E
4.2.3* (a)	✓ SF ✓ A 97 km/h = 179 km ÷ tyd Time =distance ÷ speed *Tyd = afstand ÷ spoed* = $\frac{179}{97}$ ✓ MCA = 1,845 hours ✓ CA Time duration / *tydsduur* = 1,845 hours./*uur* = 1 hour/*uur* + 0,845 × 60 min = 1 hour/*uur* 51 min Arrival time / *Aankomstyd*: = 09:55 + 1 h 51 min = 11: 46 ✓ CA	1A 179 1SF substitution 97 1MCA change formula 1CA time in hours 1CA answer (5)	M L3 D
4.2.3 (b)	✓MA Distance/*Afstand* = (713 – 263) + 2(18) = 450 + 36 ✓MA = 486 km ✓ CA **OR/*OF*** Distance /*Afstand* ✓ MA ✓ MA = (713 – 552) + 18 + 18 + (552 – 263) = 161 + 18 + 18 +289 = 486 km ✓ CA	1MA subtracting correct values 1MA getting 36 1CA total distance **OR/*OF*** 1MA subtracting correct values 1MA adding distances 1CA answer (3)	M L2 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF*	**OR/*OF***	
	✓MA Distance/*Afstand* = (455 – 5) + 2(18)	1MA subtracting correct values	
	= 450 + 36 ✓MA	1MA getting 36	
	= 486 km ✓ CA	1CA total distance	
	OR/*OF*	**OR/*OF***	
	Distance /*Afstand* ✓ MA ✓ MA = (166 – 5) + 18 + 18 + (455 – 166)	1MA subtracting correct values 1MA adding values	
	= 161 + 18 + 18 +289 = 486 km ✓ CA	1CA answer	
	OR/*OF*	**OR/*OF***	
	Distance/*Afstand* ✓MA ✓MA = 179 + 18 + (552 – 263) km = 486 km ✓CA	1MA subtracting correct values 1MA adding values 1CA answer (3)	
		[33]	

QUESTION/*VRAAG* 5 [29 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
5.1.1*	8 ✓✓A	2A correct number (2)	MP L1 E
5.1.2	Front entrance portal /*Voorste ingangsportaal* ✓MA ✓RT ✓RT $= 58 - (11 \times 4 + 2 \times 4)$ ✓A = 6 feet/ *voet* ✓CA	1MA subtracting from 58 1RT room dimensions 1RT wall thickness 1A multiplying with 4 1CA simplification (5)	MP L3 M
5.1.3	There are no walls separating the kitchen, dining room and living room. ✓✓O *Daar is geen mure wat die kombuis, eetkamer en woonvertrek skei nie*	2O reason (2)	MP L4 E
5.1.4*	Toilet **OR** bath **OR** basin or sink ✓✓A *Toilet OF bad OF wasbak*	2A correct feature (2)	MP L1 E
5.1.5	✓O ✓O 3rd floor and B that it is the second apartment *3de vloer en B is die tweede woonstel* **OR/*OF*** ✓O Block B, Number 3 ✓O *Blok B, nommer 3* **OR/*OF*** ✓O 3rd Floor, unit on the left/right ✓O *3de vloer, die eenheid links/ regs* **OR/*OF*** ✓O 3rd Floor, B-wing ✓O *3de vloer, B -vleuel*	1O numbering of the floors 1O numbering of the apartments (2)	MP L4 M
5.1.6 (a)	17,6784 m = 58 feet/*voet* Conversion factor/ *Herleidings faktor:* 1 m = $\frac{58}{17{,}6784}$ ✓RT = 3,28083989… ✓MA ≈ 3,281 feet ✓R	1RT 58 1MA simplification 1R rounded answer (3)	M L2 M
5.1.6 (b)	Width / *Breedte* = $\frac{40}{3{,}281}$ ✓RT ✓MCA = 12,191405 m ✓CA	**CA from 5.1.6 (a)** 1RT correct width 1MCA dividing 1CA simplification	M L2 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF* 58 feet/*voet* = 17,6784 m 40 feet/*voet* = *n* ✓RT $n = \frac{40}{58} \times 17{,}6784$ ✓MA = 12,191405 m ✓CA	**OR/*OF*** 1RT correct width 1MA working with ratio 1CA simplification **NPR** (3)	
5.2.1	Area /*Oppervlakte* = length × width / *lengte* × *breedte* = 0,614 m × 0,474 m ✓SF = 0,291036 m^2 = 0,3 m^2 ✓R	 1SF substitution 1R simplification **NPU** (2)	M L2 E
5.2.2*	Area for 6 panels /*Opp van 6 panele* = 0,3 m^2 × 6 = 1,8 m^2 ✓MCA Cost for 6 panels /*Koste van 6 panele* = 1,8 m^2 × R490/m^2 = R882 ✓MCA Mass of the 6 panels / *Massa van 6 panele* = 1,8 m^2 × 15 kg/m^2 = 27 kg ✓MCA Delivery mass / *Aflewerings massa*= 20 kg + 7 kg Cost of delivery / *Afleweringskoste* ✓MA = R820 + R53,50 × 7 kg ✓MCA = R1 194,50 ✓CA Total cost / *Totale koste* = R882,00 + R1 194,50 = R2 076,50 ✓CA INVALID/ *ONGELDIG* ✓O **OR/*OF***	**CA from Q 5.2.1** 1MCA simplification 1MCA simplification cost 1MCA simplification: mass 1MA cost of 1st 20kg 1MCA add and multiply 1CA simplification 1CA simplification 1O verification **OR/*OF***	M L4 D

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	Using unrounded area Area for 6 panels /*Opp van 6 panele* = 0,291036 m^2 × 6 = 1,746216 m^2 ✓CA Cost for 6 panels /*Koste van 6 panele* = 1,746216 m^2 × R490/m^2 = R855,65 ✓CA Mass of the 6 panels / *Massa van 6 panele* = 1,746216 m^2 × 15 kg/m^2 = 26,19324 kg ✓CA Delivery mass / *Aflewerings massa*= 20 kg + 7 kg Cost of delivery / *Afleweringskoste* ✓MA = R820 + R53,50 × 7 kg ✓MCA = R1 194,50 ✓CA Total cost / *Totale koste* = R855,65 + R1 194,50 = R2 050,15 ✓CA INVALID/ *ONGELDIG* ✓O	1CA simplification 1CA simplification cost 1CA simplification: mass 1MA cost for 1st 20 kg 1MCA add and multiply 1CA simplification 1CA simplification 1O verification (8)	
		[29]	
		TOTAL/*TOTAAL*: 150	

NOTE/*LET WEL*:

1.1	1.1.1 Circumference	E	The boundary that surrounds the circular shape.	Full marks for written explanations
	1.1.2 Probability	G	The likelihood that something may happen.	
	1.1.3 One hour	F	A time measurement equivalent to three thousand six hundred seconds.	
	1.1.4 Temperature	B	The measure of hotness or coldness.	

1.2.3	B	2 out of 2
1.3.1	Accept round (for circle)	2 out of 2
1.3.3	A motorist can only travel up to 120 km/h on the road. *'n Motoris mag net tot 120km/h ry op die pad,* 120 km/h is the speed limit./ Do not exceed 120 km/h on this road *120km/h is die spoedbeperking/ Jy mag nie 120km/h oorskry op die pad nie*	2 out of 2
1.3.4	For candidates writing 534 – 144 = 390	1 out of 2
2.1.3	Listing all seven correct: 1, 5, 8, 9, 10, 11, 12 Vehicle entrance, cattle vehicle, etc.	1 out of 2
2.1.4	Accept Certain /*Beslis*	2 out of 2
2.2	C E D B A	5A correct order (5)
2.3	Do not drive off the road/ *Moenie van die pad af gaan nie*.	2 out of 2
3.1.4	Using 124 m as radius, but correct calculation 48 311,392 m^2 and conclusion	2 out of 4
3.1.6	The following words can be used: Water, coal, sun, inverters	2 out of 2
3.2.2	12	3 out of 3
3.2.2	15	2 out of 3

3.3	Using this formula correctly – no part marks $°F = (°C \times \frac{9}{5}) + 32^0$ $= (70^0 \times \frac{9}{5}) + 32^0$ $= 158$	3 out of 3
4.2.1	Zambia, Zimbabwe, South Africa, Botswana	1 out of 2
4.2.3 (a)	Accept 11:45	5 out of 5
5.1.1	6 or 2	1 out of 2
5.1.4	Accept door	2 out of 2
5.2.2	Area for 6 panels/*Oppervlakte van 6 panele* $= 0,3\ m^2 \times 6$ $= 1,746216\ m^2$ $= 2\ m^2$ Cost for 6 panels/*Koste van 6 panele* $= 2\ m^2 \times R490/m^2 = R980,00$ Mass of the 6 panels/*Massa van die 6 panele* $= 2\ m^2 \times 15\ kg/m^2 = 30\ kg$ Delivery mass = 20 kg + 10 kg Cost of delivery/*Afleweringskoste* = R820 + (R53,50 × 10) = R1 355,00 Total cost/*Totale koste* = R980,00 + R1 355 = R2 335,00 INVALID/*ONGELDIG*	7 out of 8