



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2021

MARKS: 150

TIME: 3 hours

This question paper consists of 14 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
ANNEXURE B for QUESTION 4.1
ANNEXURE C for QUESTION 4.3.3
ANNEXURE D 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

Gadibolae bought Pringles (chips in a cylindrical container) on promotion at a shop. The promotion advertisement is shown below, together with a diagram of the Pringles container with dimensions.

PROMOTION ADVERTISEMENT FOR PRINGLES	DIMENSIONS OF THE CYLINDRICAL PRINGLES CONTAINER
6 Pringles for R100,00  Pringles 110 g each Promotion available: From 11 Jan. 2021 to 31 Mar. 2021	 Diameter = 64 mm Height = 230 mm

[Source: guzzle.co.za]

Use the information above to answer the questions that follow.

- 1.1.1 Determine (in grams) the total mass of the Pringles promotion bought for R100. (2)
- 1.1.2 Write down the radius of a single Pringles container. (2)
- 1.1.3 Choose the letter of the answer that will make the following statement TRUE.
- The unit to calculate the inner volume of a Pringles container is:
- A. mm^3

B. mm^2

C. $64 \times 23 \text{ mm}^2$



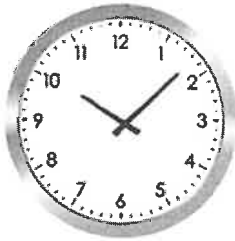
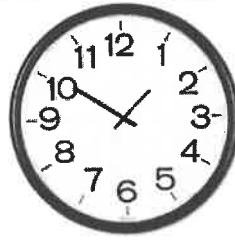
(2)
- 1.1.4 Determine the total number of days this promotion is available. (3)
- 1.1.5 Calculate the price of two 110 g Pringles containers in this promotion. (2)

1.2

Paul has entered a motorcycle race. The digital clock in QUESTION 1.2.1 shows the time he finished the race.

The odometer in QUESTION 1.2.2 shows the reading as the motorcycle crossed the finishing line.

Choose an item from COLUMN B to complete the statements in COLUMN A. Write only the letter (A–E) next to the question numbers (1.2.1 and 1.2.2), e.g. 1.2.3 F.

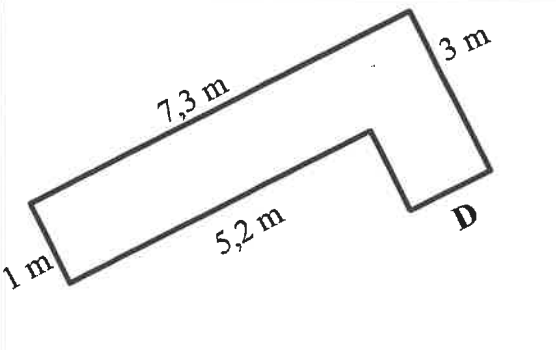
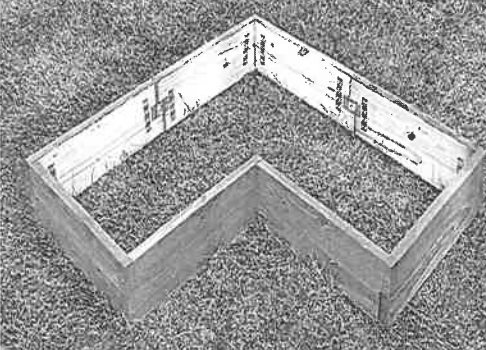
COLUMN A	COLUMN B
1.2.1 The analogue clock that shows the same time as the digital clock below, is ... 	A  B 
1.2.2 Given the following odometer:  Paul's speed is ...	C 55 km/h D 60 km/h E 680 003 km/h

(2)

(2)

1.3

A wooden L-shaped flower bed is filled with soil. Below is the L-shaped flower bed with dimensions, with **D** as a missing length.

DIMENSIONS OF THE L-SHAPED FLOWER BED	PICTURE: L-SHAPED FLOWER BED
	

[Source: plantsforafrica.com]

NOTE: All corners are right angles.

Use the information above to answer the questions that follow.

1.3.1 Convert the longest dimension of the L-shaped flower bed to cm. (2)

1.3.2 Calculate the missing length, **D**. (2)

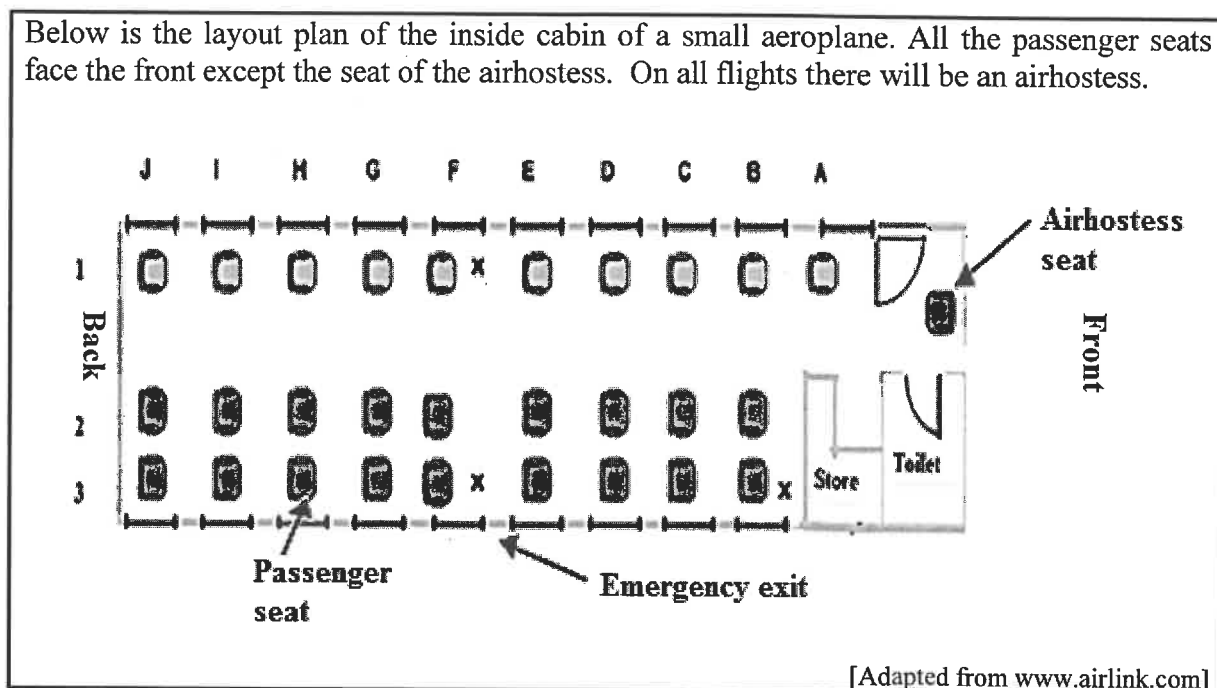
1.3.3 The volume of the flower bed with materials can be calculated as follows:

$$\begin{aligned}\text{Volume} &= (2,1 \text{ m} \times 3 \text{ m} \times 0,5 \text{ m}) + (5,2 \text{ m} \times 1 \text{ m} \times 0,5 \text{ m}) \\ &= 3,15 \text{ m}^3 + 2,6 \text{ m}^3 = 5,75 \text{ m}^3\end{aligned}$$

State which value in the above calculation represents the height of the flower bed. (2)

1.4

Below is the layout plan of the inside cabin of a small aeroplane. All the passenger seats face the front except the seat of the airhostess. On all flights there will be an airhostess.



Use the information above to answer the questions that follow.

1.4.1 Explain the meaning of a *layout plan*. (2)

1.4.2 Calculate the maximum number of passenger seats available in this aeroplane. (2)

1.4.3 Stofile is seated in D1. He gets out of his seat and walks past his seat and two more seats towards the back to talk to his friend who is seated on Stofile's right-hand side.

Using the same notation as Stofile's seat, write down the seat number of his friend. (2)

1.4.4 During the flight, passengers are allowed to choose a light snack and a drink. The choices are as follows: a muffin or a sandwich with a cola, a juice or bottled water.

Write down the number of options they can choose from. (2)

[29]

QUESTION 2

ANNEXURE A shows the floor plan of Jan's house, with a veranda*, in South Africa.

**A veranda, also known as a porch or 'stoep', is an open area with a roof over it.*

The following is an artist's drawing of one of the elevations of Jan's house.



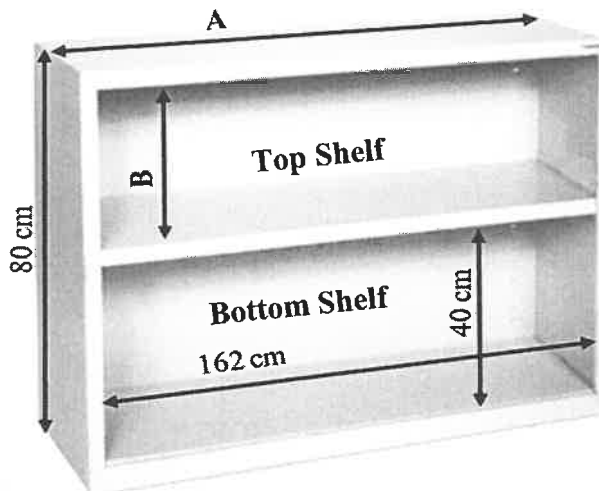
Use ANNEXURE A and the information above to answer the questions that follow.

- 2.1 Write down the number of bedrooms on the floor plan. (2)
- 2.2 Which room will be the first room you will enter from the veranda? (2)
- 2.3 In which general direction does the master bedroom window face? (2)
- 2.4 One of the door locks needs to be changed.
Write down the probability, in simplified fractional form, that it is NOT one of the interior doors. (4)
- 2.5 Jan remarked that the kitchen gets a lot of sunlight.
Critically comment on his remark. (3)
- 2.6 Give ONE reason why the windows shown in the above drawing do NOT represent the windows of the kitchen and the dining room. (2)

- 2.7 The scale used for the floor plan is 1 cm representing 1 000 mm in real life.
- 2.7.1 Write the given scale in number scale format. (2)
- 2.7.2 Measure the inner length of bedroom 2 and use the given scale to calculate the actual length (in m) of bedroom 2. (4)
- 2.7.3 Jan stated that the given scale is NOT very accurate to use if photocopies were going to be made of the plan.
- Critically comment on his statement and give a reason for your answer. (3)
- [24]

QUESTION 3

Tsidi needs a bookshelf to store her files. She decides to buy a second-hand wooden bookshelf with two shelves, as illustrated below.



DIMENSIONS:

Inside width 162 cm

Total outside height 80 cm

Inside height of the
bottom shelf 40 cm



NOTE:

Area of a rectangle = length $\times$ width

Use the information above to answer the questions that follow.

3.1 The top shelf has a thickness of 1,5 cm all around.

3.1.1 Determine **A**, the outside length of the bookshelf. (3)

3.1.2 The base of the bottom shelf is 4,5 cm thick.

Determine **B**, the inside height of the top shelf. (3)

3.2 The total outside height of the bookshelf is 31,496 inches.

Determine (rounded to TWO decimal places) the conversion factor for the height in the form **1 inch = ... cm**. (3)

3.3 Tsidi bought the bookshelf at a discounted price because the backboard which covers the entire width and height of the bookshelf, needed painting. She decides to do the following:

- Remove the backboard.
- Paint the back of the backboard with a single coat of paint.
- Paint the front of the backboard with two coats of paint.
- Nail the backboard to the bookshelf.

3.3.1 Calculate (in cm^2) the area of one side of the backboard. (2)

3.3.2 Convert the answer in QUESTION 3.3.1 to m^2 . (2)

3.3.3 One litre of paint covers $6,9 \text{ m}^2$.

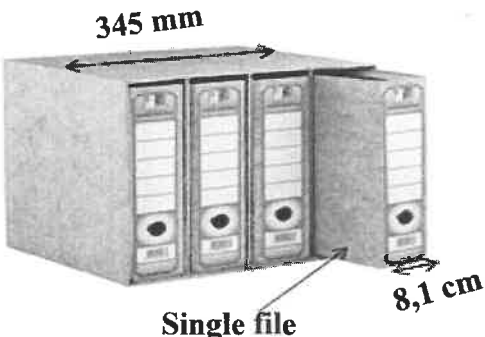
Determine (rounded to TWO decimal places) the number of litres of paint required to paint the backboard completely. (5)

3.3.4 Tsidi stated that one 500 ml can of paint is sufficient to paint the backboard completely.

Verify, with calculations, whether her statement is valid. (3)

3.4

Tsidi wants to organise her documents in files. She was informed that you can store files separately (single files) or in a filing box as shown in the picture below.

PICTURE OF A FILING BOX WITH FILES	MEASUREMENTS
 345 mm 8,1 cm Single file	A single file has a width of 8,1 cm. The width of the filing box is 345 mm

Use the information above to answer the following questions.

3.4.1 Determine the maximum number of filing boxes that could fit on one shelf, which is 162 cm wide. (4)

3.4.2 Calculate the difference in the number of files that she can place on one shelf if she packs the shelf with single files rather than the filing boxes. (5)

3.4.3 Give a possible reason why Tsidi would prefer the filing boxes. (2)

3.4.4 Tsidi bought filing boxes to pack the top shelf completely. She could not remember in which file she placed a document. She randomly chooses one of the files out of the filing boxes. Determine, as a percentage to TWO decimal places, the probability that the file she chooses will contain the document she is looking for. (3)

[35]

QUESTION 4

4.1

Mr Venter bought a farm in order to sell chickens and vegetables.
On ANNEXURE B is the layout plan of the farmyard.

Use ANNEXURE B to answer the questions that follow.

4.1.1 Name the feature on the layout plan which has an irregular shape. (2)

4.1.2 The letter J on the map represents Jojo tanks.

Give a reason why it is important to have a water tank at one's house. (2)

4.1.3 Jojo tanks are usually filled with rainwater.

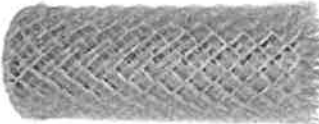
Write down TWO structures where the water to fill a Jojo tank could possibly come from. (2)

4.1.4 Calculate (in m^2) the area of the garden expansion.

You may use the following formula:

$$\text{Area of a triangle} = \frac{1}{2} \times \text{base} \times \text{height} \quad (3)$$

4.1.5 Mr Venter decides to replace the fence around the circular chicken site.
The circumference of the circular site is 18,852 m.

TWO COST OPTIONS FOR THE WIRE MESH	
OPTION A R1 154 for a 10 m roll	OPTION B R127,30 per running metre
 Picture of wire mesh	

By means of calculations, advise Mr Venter which option is more economical. (5)

4.2

One of the Jojo tanks on his farm has a 5 000 ℓ capacity. The height of the tank is 220 cm.

NOTE: $1\,000\text{ cm}^3 = 1\text{ ℓ}$

Calculate (in cm) the radius of the tank.

You may use the following formula:

$$\text{Volume of a cylindrical tank} = 3,142 \times (\text{radius})^2 \times \text{height} \quad (6)$$

- ### 4.3



$18'' = 18$ inches

Use the information above to answer the questions that follow.

- ### 4.3.1

Width of the chair : height of the chair

(2)

- ### 4.3.2

You may use the following conversions:

1 000 mm = 3,28084 feet and 12 inches = 1 foot

(3)

- ### 4.3.3

Choose an assembly instruction from COLUMN B that matches a picture in COLUMN A. Write only the letter ((i) to (iii)) next to the question numbers (4.3.3(a) to 4.3.3(c)) in the ANSWER BOOK.

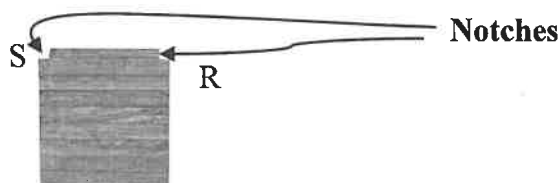
(3)

- #### 4.3.4

P  **Q** 

(2)

- ### 4.3.5



Describe how you would position the seat so that it is attached to the rest of the structure. (Use the given letters A, B, C, D on the picture and S, R on the sketch).

(3)

[33]

QUESTION 5

5.1

Noah is a travelling salesman who lives in the United States of America (USA). He uses a map to estimate his travelling time between cities.

On ANNEXURE D is a partial map which shows the following:

- Various cities
- Distances (in miles) between cities
- Average travelling times (in hours and minutes) between these cities

Use ANNEXURE D to answer the questions that follow.

5.1.1 Choose ONE letter (W, X, Y or Z) that will make EACH of the following statements below TRUE.

(a) The average time (in hours) to travel between Lee and Springfield is ...

W $\frac{50}{60}$

X $\frac{50}{100}$

Y 0,5

Z 41

(2)

(b) Which city lies southeast of Boston?

W Providence

X Lowell

Y Gloucester

Z Plymouth

(2)

5.1.2 Noah found that the same time 01:05 is estimated for travelling from Providence to Boston and from Springfield to Worcester.

(a) Write down the actual distances (in miles) from Providence to Boston and from Springfield to Worcester.

(3)

(b) Give ONE possible reason why the map indicates the same travelling time for these two different distances.

(2)

- 5.1.3 Noah travelled from Portland passing three cities (A, B and C in the table) to reach his destination city, D.

TABLE 1 below shows the time taken to travel between various unknown cities indicated by A, B, C and D.

TABLE 1: TIME TAKEN BETWEEN CITIES

START CITY	DESTINATION CITY	TIME TAKEN BETWEEN CITIES
Portland	A	01:35
A	B	$\frac{1}{2}$ hour
B	C	00:35
C	D	1 hour

Name cities A, B, C and D. (4)

- 5.1.4 The fuel tank of Noah's car has a capacity of 23 gallons. Noah claims that in South Africa it will cost him less than R1 400 to fill up his fuel tank to capacity.

NOTE:

- 1 gallon = 3,785 litres
 - Fuel cost R15,97/ℓ
- [Source: AA Petrol price on 2 March 2021]

Verify, with calculations, whether his claim is valid. (4)

- 5.1.5 Noah stays in Greenfield and travels to Fitchburg and back, from Monday to Friday. He fills his car's fuel tank on Monday morning. The fuel consumption of his car is 18 miles per gallon. He refuels his car to capacity as soon as he does not have enough fuel to complete a trip between the two cities.

Determine the number of gallons of fuel left in his car's tank on arrival in Greenfield on Friday afternoon. (8)

- 5.2 A temperature reading of -7°C was displayed on the screen on the dashboard of Noah's car. Determine (to the nearest ten) the temperature in degrees Fahrenheit.

Use the formula: $^{\circ}\text{C} = \frac{5}{9} \times (^{\circ}\text{F} - 32)$ (4)
[29]

TOTAL: 150



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GRADE 12

MATHEMATICAL LITERACY P2

ADDENDUM

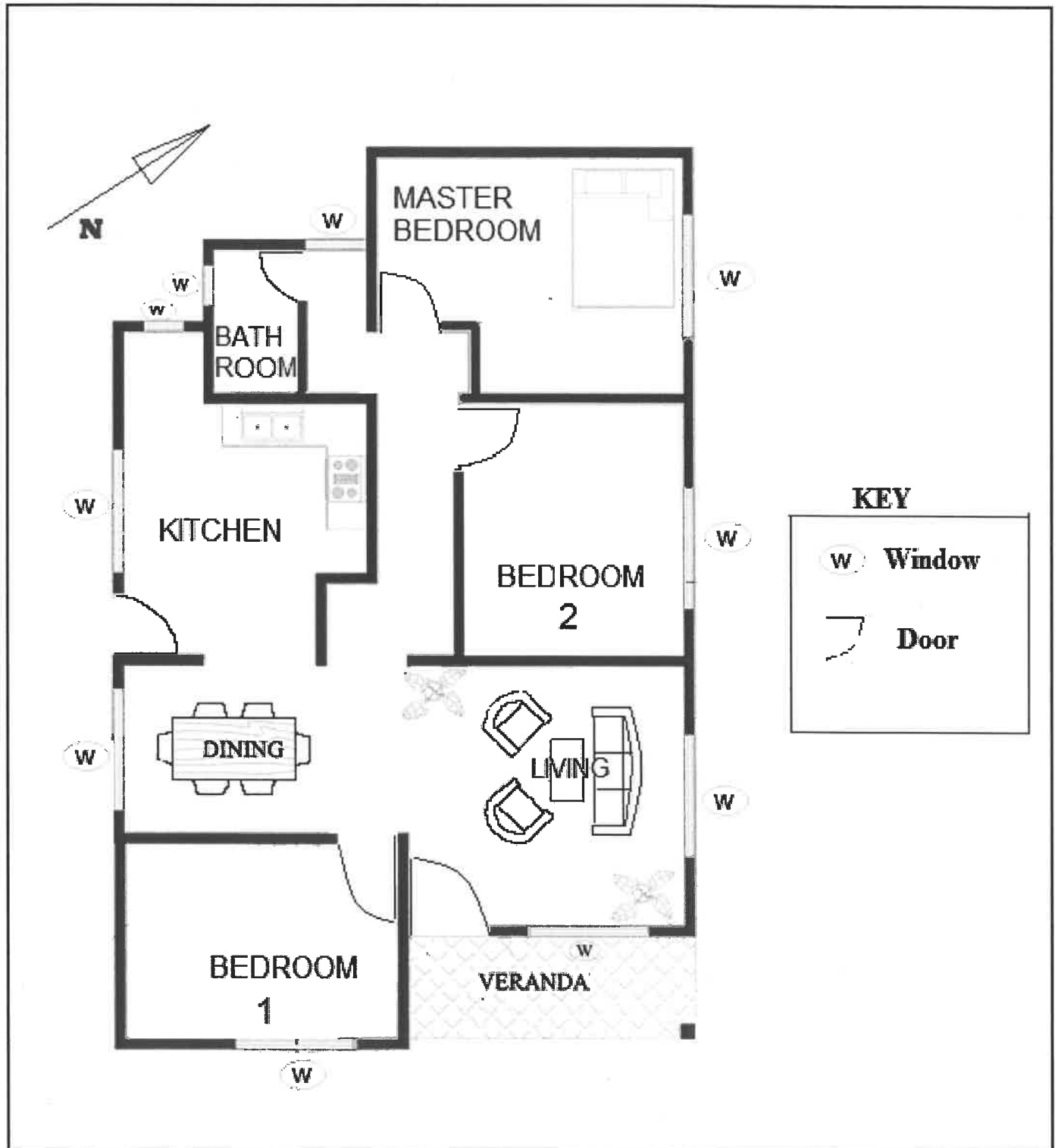
NOVEMBER 2021

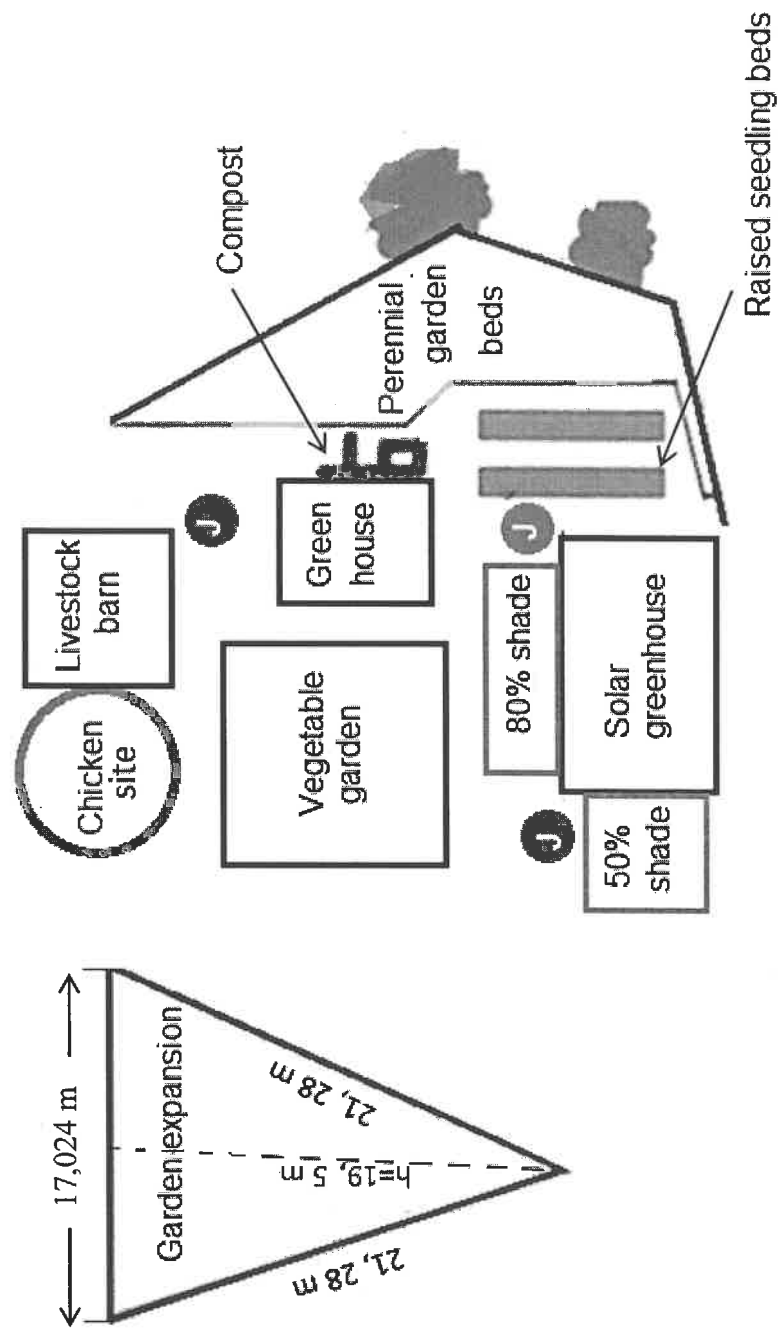
This addendum consists of 5 pages with 4 annexures.

ANNEXURE A

QUESTION 2

FLOOR PLAN OF A HOUSE



ANNEXURE B**QUESTION 4.1****LAYOUT PLAN OF THE FARMYARD**

ANNEXURE C

QUESTION 4.3.3

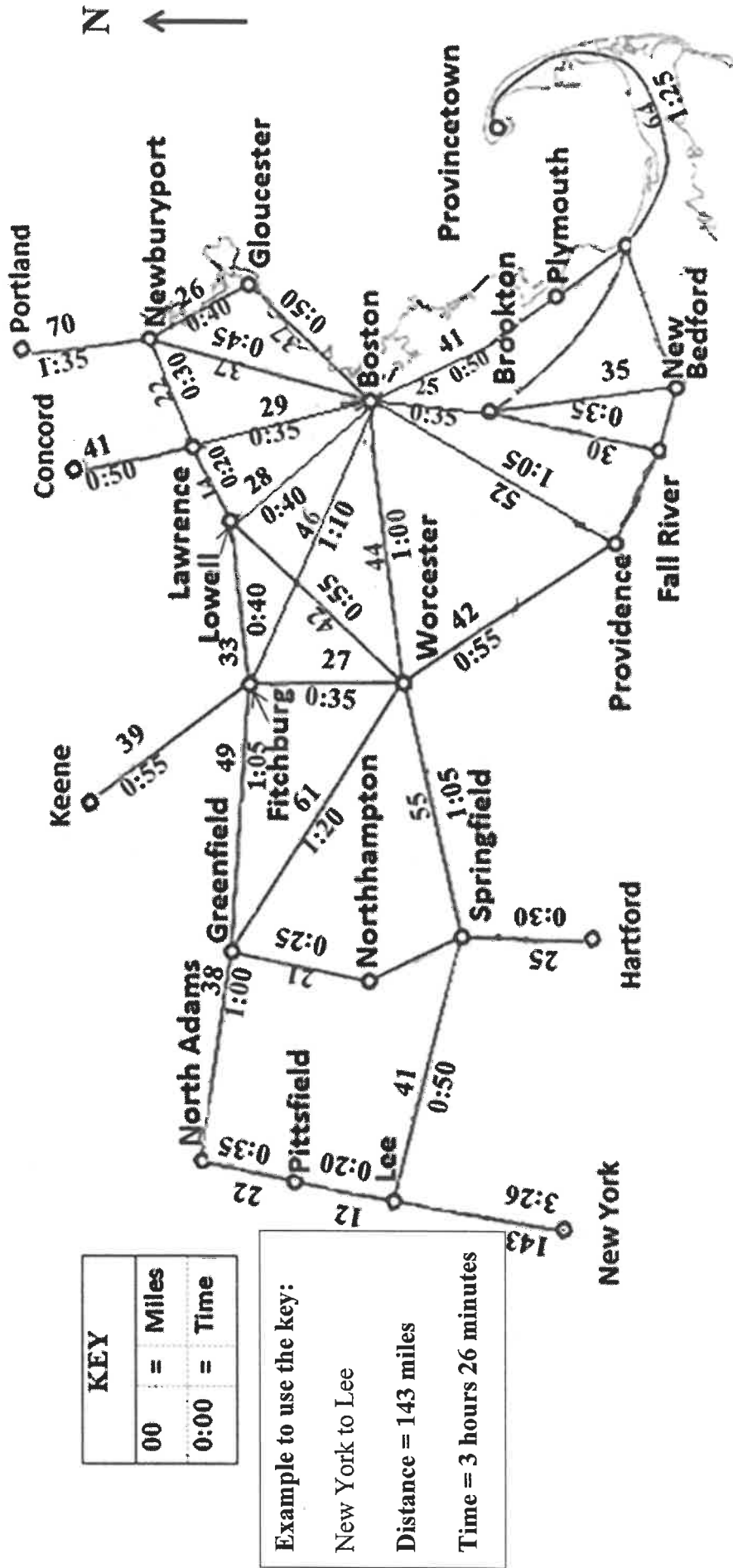
DIAGRAMS AND SOME ASSEMBLY INSTRUCTIONS FOR THE CHAIR

COLUMN A	COLUMN B
(a) 	(i) Attach to the stretcher to the front legs as shown, using glue and screws.
(b) 	(ii) Attach the front legs to the back legs with the stretchers.
(c) 	(iii) Secure the back slats using glue and screws. Position the back stretcher on the legs as shown, then secure using glue and screws.

ANNEXURE D

QUESTION 5.1

PARTIAL MAP OF THE UNITED STATES OF AMERICA SHOWING DISTANCES (IN MILES) AND TIME (IN HOURS AND MINUTES) TAKEN BETWEEN VARIOUS CITIES





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GRADE/GRAAD 12

MATHEMATICAL LITERACY P2/ WISKUNDIGE GELETTERDHEID V2

NOVEMBER 2021

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/map/diagram/Lees vanaftabel/kaart/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./Penalisering, bv. vir geen eenhede/verkeerde afronding, ens.
R	Rounding off/Afronding
NPR	No penalty for correct rounding minimum two decimal places/Geenpenaliseringvir korrekte afronding tot twee desimale plekke nie
AO	Answer only/Slegs antwoord
MCA	Method with constant accuracy/Metode met volgehoue akkuraatheid

These marking guidelines consist of 19 pages.
Hierdienasienriglynebestaanuit 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, merk slegs die EERSTE poging.
- As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, merk die doodgetrekte (gekanselleerde) poging.
- 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 en ekstra antwoorde gee, penaliseer vir elke ekstra item.
- 'n Algemene merkbeginsel is dat indien 'n kandidaat een fout maak en daarna voortgaan met korrekte wiskunde, dat die kandidaat slegs een punt verloor.

QUESTION/VRAAG 1 [29 MARKS/PUNTE] Answer Only AO - full marks			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
1.1.1	Total mass/Totale massa $= 6 \times 110\text{g}$ ✓MA $= 660\text{ g}$ ✓A	1MA multiply mass by 6 1A mass (2)	M L1
1.1.2*	Radius = 32 mm ✓✓A	2A radius (2)	M L1
1.1.3	A ✓✓A	2A correct letter [accept: mm ³] (2)	M L1
1.1.4*	Total No. of days/Totale getal dae $= 11\text{ Jan to }31\text{ Mar}$ $\checkmark\text{ MA}$ $= (31 - 10) + 28 + 31$ ✓ MCA $= 21 + 28 + 31 = 80$ ✓CA	1MA days in Jan 1MCA adding days in 3 months 1CA simplification (3)	M L1

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
1.1.5*	Price for 2 Pringles/Prys vir 2 Pringles $= 2 \left(\frac{R100}{6} \right)$ ✓ MA $= 2 \times R16,666$ $= R33,33$ ✓ CA	1MA dividing price by 6 and multiplying by 2 1CA simplification NPR (2)	M/F L1
1.2.1	A ✓✓ A	2A correct letter (2)	M L1
1.2.2	D ✓✓ A	2A correct letter Accept 60 km/h (2)	M L1
1.3.1	7,3 m = $7,3 \times 100$ cm ✓ MA $= 730$ cm ✓ A	1MA multiplying correct value by 100 1A simplification (2)	M L1
1.3.2*	D = $7,3 \text{ m} - 5,2 \text{ m}$ ✓ MA $= 2,1 \text{ m}$ ✓ CA	1MA difference of correct lengths 1CA simplification (2)	M L1
1.3.3	0,5m ✓✓ A	2A height (2)	M L1
1.4.1*	✓A A layout plan is a top view that shows the arrangement of features. 'n Uitlegplan is die bo-aansig wat die rangskikking van die voorwerpe aantoon. OR/OF A layout plan is the structural arrangement of items within a certain space. 'n Uitlegplan is die strukturele rangskikking van items binne 'n bepaalde ruimte. OR/OF Plan of the entire inside cabin, showing location of seats, exit doors etc. 'n Plan van die hele binnekant van die kajuut wat die posisie van sitplekke, uitgang, deure ens. aantoon OR/OF Drawing to scale showing physical arrangements of all resources that consume space within facilities. 'n Skaaltekening wat die fisiese posisies van al die items van spasie in beslag neem binne die fasiliteit	2Aexplanation (2)	MP L1

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
1.4.2*	28 ✓✓A	2A number of seats (2)	MP L1
1.4.3	✓A ✓A G1	1A correct seat 1A correct row (2)	MP L1
1.4.4*	6 ✓✓A	2A correct number (2)	P L1
		[29]	

QUESTION/VRAAG 2 [24MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
2.1	3 ✓✓A	2A correct number (2)	MP L2
2.2	Living room/Woonkamer ✓✓A	2A correct room (2)	MP L1
2.3	North East or NE/Noordoos of NO ✓✓A	2A direction (2)	MP L2
2.4*	$P_{\text{not interior/nie binne}} = P_{\text{exterior/buite}}$ $= \frac{2}{6} \quad \checkmark\checkmark\text{RT}$ $= \frac{1}{3} \quad \checkmark\text{A}$ $= \frac{1}{3} \quad \checkmark\text{CA}$ OR/OF $P_{\text{not interior/nie binne}} = 1 - \frac{4}{6} \quad \checkmark\text{MA}$ $= \frac{2}{6} \quad \checkmark\text{RT}$ $= \frac{1}{3} \quad \checkmark\text{A}$ $= \frac{1}{3} \quad \checkmark\text{CA}$	2RT numerator 1A denominator 1CA simplification OR/OF 1MA probability of NOT 1RT numerator 1A denominator 1CA simplification (4)	P L2
2.5	Jan is wrong, the kitchen is on the Southern side. In South Africa it does not get a lot of sun. <i>Jan is verkeerd. Die kombuis is aan die suidlike kant. In Suid-Afrika kry dit nie baie son nie.</i>	1A wrong 2O reasoning (3)	MP L4
2.6	It cannot be the view showing the kitchen and dining room, as it does not show the extra window for the bathroom. <i>Dit kannie die kombuis en eetkamer wees nie want dit wys nie die venster van die badkamer nie.</i> It does not show the other rooms on both sides of the windows. <i>Dit wys nie die ander kamers weerskante van die vensters nie.</i> OR/OF It shows the veranda, door, bedroom and livingroom windows. <i>Dit wys die stoep, deur en slaapkamer en woonkamervensters.</i> OR/OF	2O reason	MP L4

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	OR/OF Because there is no veranda on the side of the kitchen and the picture shows the veranda. <i>Daar is nie 'n stoep aan die kombuis se kant nie en die prent toon 'n stoep</i> OR/OF The drawing shows the SE elevation and the kitchen is on the SW side. <i>Die prent toon die SO aansien die kombuis is aan die SW kant.</i> OR/OF The windows shown does not look like kitchen windows, they are too big. <i>Die vensters wat aangetoon word lyk nie soos kombuisvensters nie, hulle is te groot</i> OR/OF The drawing represents the front view. <i>Die prent is die vooraansig</i> OR/OF Kitchen should be on the left-hand side with the window and door / The door knob is on the right-hand side and not on the left-hand side of the door adjacent to the kitchen window. <i>Kombuis moet aan die linkerkant met die vensterendeur wees / Die deurknop is aan die regterkant en nie aan die linkerkant van die deur wat grens aan die kombuisvenster nie.</i>		
2.7.1*	10 mm : 1 000 mm ✓A = 1 : 100 ✓CA OR/OF 1 cm : 100 cm ✓A = 1 : 100 ✓CA	1A correct ratio and conversion 1CA simplification OR/OF 1A correct ratio and conversion 1CA simplification AO	MP L2
2.7.2	Length on floor plan/Lengte op die vloerplan = 4,4 cm ✓A 1 cm = 100 cm 4,4 cm = 4,4 × 100 cm ✓MCA = 440 cm ✓CA = 4,4 m ✓C OR/OF	CA from 2.7.1 1A correct measurement 1MCA using the scale 1CA simplification 1C conversion Accept 4,3 m to 4,5 m	MP L3

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	1 cm is 1 000 mm $\checkmark$A 4,4 cm is 4 400 mm $\checkmark$MCA $\checkmark$CA 4 400 mm = 4,4 m $\checkmark$C OR/OF 1cm : 1 000 mm $\checkmark$MCA 1cm : 1 m $\checkmark$C $\checkmark$A 4,4 cm : 4,4 m $\checkmark$CA	1A correct measurement 1MCA using the scale 1CA simplification 1C conversion OR/OF 1MCA using the scale 1C conversion 1A correct measurement 1CA simplification (4)	
2.7.3	Jan is correct. $\checkmark$A $\checkmark\checkmark$O When a photocopy is made the size of the plan may change while the number scale remains the same. <i>Jan is korrek.</i> <i>Wanneer jy 'n fotostaat maak, kan die grootte van die plan verander en die getalskaal bly dieselfde</i>	1A opinion 2O verification (3)	MP L4
		[24]	

QUESTION/VRAAG 3 [35 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
3.1.1	$\begin{aligned} & \checkmark RT \quad \checkmark MA \\ A &= 162 \text{ cm} + 1,5 \text{ cm} + 1,5 \text{ cm} \\ &= 162 \text{ cm} + (1,5 \text{ cm} \times 2) \\ &= 165 \text{ cm} \quad \checkmark CA \end{aligned}$	1RT inside length 1MA adding both sides 1CA simplification (3)	M L1
3.1.2*	$\begin{aligned} & \checkmark RT \quad \checkmark MA \\ B &= 80 \text{ cm} - (40 \text{ cm} + 4,5 \text{ cm} + 1,5 \text{ cm} + 1,5 \text{ cm}) \\ &= 32,5 \text{ cm} \quad \checkmark CA \end{aligned}$	1RT both heights 1MA subtracting 1CA simplification (3)	M L1
3.2	$\begin{aligned} 31,496 \text{ inches/duim} &= 80 \text{ cm} \quad \checkmark RT \\ 1 \text{ inch/duim} &= \frac{80}{31,496} \text{ cm} \quad \checkmark MA \\ &= 2,54 \text{ cm} \quad \checkmark A \end{aligned}$	1RTheight 80 cm 1MA dividing by 31,496 1A simplification (3)	M L2
3.3.1	$\begin{aligned} \text{Area of a rectangle} &= \text{length} \times \text{width} \\ \text{Opp van 'n reghoek} &= \text{lengte} \times \text{breedte} \\ &= 165 \text{ cm} \times 80 \text{ cm} \quad \checkmark MCA \\ &= 13\,200 \text{ cm}^2 \quad \checkmark CA \end{aligned}$	CA from 3.1.1 1MCA substitution 1CA simplification (2)	M L2
3.3.2*	$\begin{aligned} \text{Area of a rectangle} &= 13\,200 \text{ cm}^2 \\ &= \frac{13\,200}{(100)^2} \text{ m}^2 \quad \checkmark MCA \\ &= 1,32 \text{ m}^2 \quad \checkmark CA \end{aligned}$ or Area $= 1,65 \times 0,8$ $= 1,32 \text{ m}^2$	CA from 3.3.1 1MCA dividing by 100^2 or 10 000 1CA simplification AO (2)	M L2
3.3.3	$\begin{aligned} 1 \ell \text{ covers/bedek} & 6,9 \text{ m}^2 \\ n \ell \text{ covers/bedek} & 1,32 \text{ m}^2 \\ n &= \frac{1,32}{6,9} \quad \checkmark MA \\ &= 0,1913... \ell \quad \checkmark CA \\ \\ \text{To paint three coats/ Om drie lae te verf} & \\ & \checkmark MA \\ 0,1913... \ell \times 3 &= 0,57 \ell \quad \checkmark CA \\ & \checkmark R \end{aligned}$	CA from 3.3.2 1MA dividing by 6,9 1CA simplification 1MA multiplying with 3 1CA simplification 1R rounding	M L3

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	OR/OF Total area to cover / <i>Totale oppervlakte om te dek</i> $\checkmark\text{MA}$ $= 1,32 \text{ m}^2 \times 3 = 3,96 \text{ m}^2 \quad \checkmark\text{CA}$ 1 ℓ covers/<i>bedek</i> $6,9 \text{ m}^2$ $x \text{ ℓ covers /bedek } 3,96 \text{ m}^2$ $\checkmark\text{MA}$ $x = \frac{3,96}{6,9} = 0,57 \text{ ℓ} \quad \checkmark\text{CA} \quad \checkmark\text{R}$ OR/OF Paint needed/<i>Verf benodig</i> $\checkmark\text{MA}$ $= \frac{1,32 \times 2}{6,9} \text{ ℓ} + \frac{1,32}{6,9} \text{ ℓ} \quad \checkmark\text{MA}$ $\checkmark\text{CA} \quad \checkmark\text{CA}$ $= 0,38 \text{ ℓ} + 0,19 \text{ ℓ}$ $= 0,57 \text{ ℓ} \quad \checkmark\text{R}$ OR/OF Total area to cover / <i>Totale oppervlakte om te dek</i> $\checkmark\text{MA} \quad \checkmark\text{CA}$ $= 1,32 \text{ m}^2 \times 3 = 3,96 \text{ m}^2$ Spread rate/ <i>Spreikoers</i> = $\frac{1 \text{ ℓ}}{6,9 \text{ m}^2} \quad \checkmark\text{MA}$ $= 0,144... \text{ ℓ/m}^2$ Total amount of litres / <i>Totale aantal liters</i> $= 0,144 \times 3,96 \quad \checkmark\text{CA}$ $= 0,57 \text{ ℓ} \quad \checkmark\text{R}$ OR/OF Spread rate/ <i>Spreikoers</i> = $\frac{1 \text{ ℓ}}{6,9 \text{ m}^2} \quad \checkmark\text{MA}$ $= 0,144... \text{ ℓ/m}^2$ Paint needed for 1 coat/ <i>Verf nodig vir 1 laag</i> $= 0,144 \times 1,32 = 0,19... \text{ ℓ} \quad \checkmark\text{CA}$ Paint needed for 3 coats/ <i>Verf nodig vir 3 lae</i> $\checkmark\text{MA}$ $= 0,19... \times 3 \quad \checkmark\text{CA}$ $= 0,57 \text{ ℓ} \quad \checkmark\text{R}$	1MA multiplying with 3 1CA simplification 1MA dividing by 6,9 1CA simplification 1R rounding OR/OF 1MA dividing by 6,9 1MA adding the 2 coats and 1 1CA simplification 1CA simplification 1R rounding OR/OF 1MA multiplying with 3 1CA simplification 1MA dividing by 6,9 1CA simplification 1R rounding OR/OF 1MA dividing by 6,9 1CA simplification 1MA multiplying with 3 1CA simplification 1R rounding (5)	
3.3.4	$0,57 \text{ ℓ} \times 1\,000 \quad \checkmark\text{MCA}$ $= 570 \text{ ml} \quad \checkmark\text{CA}$ Not valid $\checkmark\text{O}$ <i>Nie geldig nie</i>	 1MCA (from Q3.3.3 multiply by 1 000) 1CA simplification 1O verification	M L4

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	OR/OF 500 ml ÷ 1 000 ✓MCA = 0,5 l less than 0,57l ✓CA Tsidi's statement is invalid ✓O OR/OF 1 l covers/bedek 6,9 m² 500 ml covers/bedek $\frac{6,9}{2} = 3,45 \text{ m}^2$ ✓MCA Area to paint / Opp om te verf = 1,32 m² × 3 = 3,96 m² ✓CA The paint is not enough / invalid ✓O Die verf is nie genoeg / nie geldig OR/OF Coverage per coat/Dekking per laag = $\frac{500 \text{ ml}}{3} = \frac{0,5 \text{ l}}{3} = 0,166..$ ✓MCA Coverage /Dekking = 0,166 × 6,9 = 1,15 m² ✓CA 1,32 m² needs to be covered per coat/moet per laag gedek word. Not valid / Nie geldig nie ✓O	OR/OF 1MCA (from Q3.3.3 dividing by 1 000) 1CA simplification 1O verification OR/OF 1MCA area 1CA simplification 1O verification OR/OF 1MCA dividing 1CA simplification 1O verification (3)	
3.4.1*	Number of boxes/ Getal bokse = $\frac{162 \text{ cm}}{34,5 \text{ cm}}$ ✓MA = 4,695... ✓CA ∴ 4 boxes ✓R OR/OF Number of boxes/ Getal bokse = $\frac{1\,620 \text{ mm}}{345 \text{ mm}}$ ✓C ✓MA = 4,695... ✓CA ∴ 4 boxes ✓R	1MA dividing 1C conversion 1CA simplification 1R rounding down OR/OF 1C conversion 1MA dividing 1CA simplification 1R rounding down (4)	M L2 #

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
3.4.2	Number of single files/ <i>Getal enkel lêers</i> $= \frac{162\text{cm}}{8,1\text{cm}} \quad \checkmark\text{MA}$ $= 20 \quad \checkmark\text{A}$ Number of files in boxes / <i>Getal lêers in 'n boks</i> $= 4 \times 4 \quad \checkmark\text{RT}$ $= 16 \quad \checkmark\text{CA}$ Difference in the number of files/ <i>Verskil in getal lêers</i> $= 20 - 16$ $= 4 \quad \checkmark\text{CA}$	CA number of boxes from 3.4.1 1MA dividing 1A simplification 1RT number of files in a box 1CA simplification 1CA difference in files (5)	M L3
3.4.3	Neater storage/ <i>Netjieser berging</i> $\checkmark\checkmark\text{O}$ OR/OF Files stand up straight/ <i>Die lêers staan regop</i> OR/OF Prevents dust on documents in the files/ <i>Verhoed dat stof op die dokumente in die lêers kom.</i> OR/OF It is easier to separate the files accordingly. <i>Dit is makliker om haar lêers te verdeel</i> OR/OF To categorise /organise her files/ <i>Dit is om haar lêers te katagoriseer /organiseer</i> OR/OF Prevent files from breaking/ damage/protect files <i>Verhoed dat lêers breek of beskadig/beskerm lêers</i>	2O reason (2)	M L4
3.4.4	$P = \frac{1}{16} \times 100\% \quad \checkmark\text{A}$ $= 6,25\% \quad \checkmark\text{MCA}$ $\quad \checkmark\text{CA}$	CA denominator from 3.4.2 1A numerator 1MCA denominator 1CA simplification (3)	P L2
		[35]	

QUESTION/VRAAG 4 [33 MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
4.1.1	✓✓A Perennial garden bed./Meerjarige tuinbeddings OR/OF Compost / Kompos	2A correct feature (2)	MP L2
4.1.2	Water is scarce/Water is skaars OR/OF Rain water is free compared to tap water ✓✓O Reënwater is gratis in vergelyking met kraanwater OR/OF Pay less water bills/Betaal minder vir water OR/OF Water storage/ om water te stoor OR/OF To save water for future use Om water te spaar vir toekomstige gebruik OR/OF To harvest rain water Om reënwater op te gaar	2A Reason (2)	MP L4
4.1.3	Greenhouse roof/ gutters / Kweekhuis dak/geute ✓O OR/OF Livestock Barn roof/ gutters / Vee stoor dak/geute ✓O OR/OF Solar greenhouse roof / gutters/ Sonkrag kweekhuis	1A correct structure 1A 2nd correct structure Accept roof and gutter /pipe full marks (Any 2 structures) (2)	MP L4
4.1.4	Area/Oppervlakte = $\frac{1}{2} \times 17,024 \text{ m} \times 19,5 \text{ m}$ ✓RT ✓RT = 165,984 m² ✓CA	1RT correct height 1RT correct base 1CA area of a triangle NPR (3)	M L2
4.1.5	Option/Opsie A = R1 154 × 2 ✓MA = R2 308 ✓CA Option/Opsie B = R127,30 × 19 ✓MA = R2 418,70 ✓CA Option A. ✓O Opsie A.	1MA multiply by 2 1CA option A cost 1MA multiply by 19 1CA option B cost 1O best option (5)	MF L4

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
4.2	$\text{Volume} = 3,142 \times r^2 \times \text{height/hoogte}$ $\checkmark \text{SF}$ $5000 \ell = 3,142 \times r^2 \times 220 \text{ cm}$ $\checkmark \text{C}$ $5000\,000 = 691,24 \times r^2$ $\frac{5\,000\,000}{691,24} = r^2 \quad \checkmark \text{M}$ $7233,377698 = r^2 \quad \checkmark \text{S}$ $\sqrt{7233,377698} = r \quad \checkmark \text{M}$ $85,05 \text{ cm} = r \quad \checkmark \text{CA}$	1SF substituting 5000 1C converting ℓ to cm^3 1M dividing by 691,24 1S simplification 1M finding square root 1CA radius value NPR (6)	M L3
4.3.1*	$18 : 42 \quad \checkmark \text{A}$ $= 3 : 7 \quad \checkmark \text{CA}$	1A correct order and values 1CA only if one value is correct or reversed order (2)	MP L1
4.3.2	$\text{Height/hoogte} = \frac{42''}{12''} = 3,5 \text{ feet/voet} \quad \checkmark \text{MA}$ $3,28084 \text{ feet/voet} = 1\,000 \text{ mm}$ $\therefore 3,5 \text{ feet/voet} = \frac{3,5}{3,28084} \times 1\,000 \quad \checkmark \text{C}$ $= 1\,066,799 \dots \text{mm} \quad \checkmark \text{CA}$ OR/OF $3,28084 \text{ feet} = 1\,000 \text{ mm}$ $1 \text{ foot} = n \quad \checkmark \text{MA}$ $n = 304,79999 \text{ mm}$ $1 \text{ foot} = 12 \text{ inches}$ $\text{Then } 12 \text{ inches} = 304,79999 \text{ mm}$ $1 \text{ inch} = \frac{304,79999 \text{ mm}}{12} \quad \checkmark \text{C}$ $= 25,39999 \text{ mm}$ $\text{Therefore } 42 \text{ inches} = 42 \times 25,39999 \text{ mm}$ $= 1066,7999 \text{ mm}$ $= 1\,066,8 \text{ mm} \quad \checkmark \text{CA}$	1MA converting to feet 1C converting to mm 1CA simplification OR/OF 1MA converting to feet 1C converting to mm 1CA simplification NPR (3)	M L2

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
4.3.3	(a) iii ✓A (b) i ✓A (c) ii ✓A	3A correct Roman numeral (3)	MP L1
4.3.4	Q ✓✓A	2A correct letter (2)	MP L1
4.3.5*	✓✓A The notch labelled S is placed against B and the notch labelled R is placed against C ✓A <i>Die sitplek word bo-op die kantspanstukke geplaas</i> <i>Die uitkeping S word op B geplaas en die uitkeping R word teen C geplaas.</i>	2A mentioning the position of the 1st notch 1A second notch (3)	MP L4
		[33]	

QUESTION/VRAAG 5 [29MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
5.1.1 (a)	W ✓✓A	2A correct letter Accept $\left(\frac{50}{60}\right)$ (2)	M L1
5.1.1 (b)	Z ✓✓A	2A correct letter Accept Plymouth (2)	MP L2
5.1.2* (a)	Providence to Boston = 52 miles ✓✓RT Springfield to Worcester = 55 miles ✓RT	2RT distance 1RT distance (3)	MP L2
5.1.2 (b)	Conditions or nature of the roads/ <i>Toestand van die paaie</i> OR/OF Permissible speed or differing speed limits <i>/Toelaatbare spoed of verskillende spoedbepalings</i> OR/OF ✓✓O Volume of traffic on the road/ <i>Hoeveelheid verkeer op die pad</i> OR/OF Number of Traffic lights/ <i>Aantal verkeers ligte</i> OR/OF Speed humps / Animals / Riots/Unrest/Protest <i>Spoedhobbels /diere / oproer/ onrus/ protes aksies</i> (2)	2A opinion	MP L4
5.1.3	A Newburyport ✓A B Lawrence ✓A C Boston ✓A D Worcester ✓A	1A Newburyport 1A Lawrence 1A Boston 1A Worcester (4)	MP L2

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
5.1.4	Number of litres in 23 gallons/<i>Getal liter in 23 gelling</i> $= 3,785 \times 23$ ✓ C $= 87,055$ litre ✓ S Cost of 87,055 litre/ <i>Prys vir 87,055 liter</i> $= 87,055 \times R15,97$ $= R1\ 390,27$ ✓ CA Valid/ <i>Geldig.</i> ✓ O OR/OF Number of litres / <i>Getal liter</i> $= \frac{R1400}{R\ 15,97}$ $= 87,664..$ litre ✓ S Number of gallons / <i>Getal gellings</i> $= \frac{87,664}{3,785}$ ✓ C $= 23,16$ gallons ✓ CA Can buy more with R1 400/<i>Kan meer koop met R 1400</i> Valid / <i>Geldig</i> ✓ O	1C gallons to litre 1S simplification 1CA cost of fuel 1O conclusion OR/OF 1S simplification 1C gallons to litre 1CA cost of fuel 1O conclusion NPR	MF L4 (4)

Q/V	Solution/Oplossing	Explanation/Verduidelik	T/L
5.1.5	1 full tank of fuel/ 1 vol tenk = 23 gallons /gelling ✓ A He can travel/ Hykan reis = $23 \times 18 = 414$ miles Distance/afstand ✓ RT Greenfield - Fitchburg = 49 miles/myl Number of trips on 1 full tank /Getalritte met 1 voltenk $= \frac{414}{49} = 8,448..$ ✓ MA ✓ CA ∴ 8 trips on 1 full tank / 8 ritte met 1 voltenk So, then he will fill tank back to 23 gallons Dan hervulhy die tenk tot 23 gelling Amount of fuel for 1 return trip/ brandstofvir1heen-en-weer reis $= \frac{98}{18} = 5,44$ gallon ✓ MA ✓ CA Left in a tank is $23 - 5,44 = 17,56$ gallons. ✓ MA ✓ CA Oor in die tenk is $23 - 5,44 = 17,56$ gelling OR/OF ✓ RT Distance/afstand_(Greenfield and Fitchburg) = 49 miles/myl Weekly must travel/ moet weekliks ry $= 5 \times 2 = 10$ trips ✓ MA He can travel = $23 \times 18 = 414$ miles with a full tank. ✓ MA Hy kan 414 myl ry met 'n vol tenk, 8 trips is $49 \times 8 = 392$ miles – now he needs to refill after Thursday's trips 8 ritte is 392 myl – dan hervul hy na Donderdag se terugkeer. With the full tank he only needs to travel Friday return trip / HyrydanslegsVrydagheen-en-weer ✓ A Friday trip: $49 \times 2 = 98$ miles / myl Used/Gebruik = $\frac{98}{18} = 5,44$ gallons/ gelling ✓ MA ✓ CA Left in a tank is $23 - 5,44 = 17,56$ gallons. ✓ MA ✓ CA Daar is $23 - 5,44 = 17,56$ gelling in die tenk oor	1A travel distance 1RT trip distance 1MA dividing 1CA number of trips 1MA dividing 1CA simplification 1MA subtracting 1CA simplification OR/OF 1RT trip distance 1MA weekly miles 1MA multiply 1A travel distance 1MA dividing 1CA usage on last day 1MA subtracting 1CA diff. between capacity and used gallons	M L3

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	18 miles on 1 gallon / 18 myl op 1 gelling ✓ RT 49 miles on x gallon / 49 myl op x gelling $x = \frac{48}{18} = 2,722...$ ✓ MA ✓ A gallon per trip / gelling per rit Number of trips on 1st full tank / Getalritte met 1st voltenk $= \frac{23}{2,722...} = 8,44...$ ✓ CA ∴ 8 trips before he fills up again / 8 rittevoorhyweervolmaak ∴ 2 trips with second full tank/ 2 ritte met die 2de voltenk Fuel used / Brandstofverbruik ✓ MA ✓ CA $= 2,722... \times 2 = 5,44...$ gallon / gelling Left in the tank / Oor in die tenk ✓ MA ✓ CA $= 23 - 5,44... = 17,56$ gallon / gelling. OR/OF Single Trip/Enkelrit = 49 miles /myl ✓ RT Number of gallons for 1 trip/ Getal gelling vir 1 rit ✓ MA ✓ A $= 49 \div 18 = 2,72$ Number of gallons for return trip/ virretoerrit $= 2,72 \times 2 = 5,44$ ✓ CA ✓ MA ✓ CA $23 \text{ gallons/gelling} \div 5,44 = 4,22 \text{ days/dae}$ $\approx 4 \text{ days/dae}$ No of gallons left / Hoeveelheid gelling oor ✓ MA ✓ CA $= 23 - 5,44 = 17,56$ gallons OR/OF	1RT trip distance 1MA dividing 1A travel distance 1CA number of trips 1MA multiplying 1CA simplification 1MA subtracting 1CA simplification OR/OF 1RT trip distance 1MA dividing 1A travel distance 1CA number of trips 1MA dividing 1CA simplification 1MA subtracting 1CA simplification OR/OF	

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	23 × 18 = 414 miles/myl ✓A Monday/Maandag : 49 × 2 = 98 miles/myl Tuesday/Dinsdag : 98 miles/myl Wednesday/Woensdag: 98 miles/myl Thursday/ Donderdag 98 miles/myl Totaal = 392 miles/myl ✓CA Fill up the tank on Thursday / <i>Maak die tenk vol petrol op Donderdag</i> Used per day /<i>Gebruik per dag</i> ✓ MA ✓ CA = 98 ÷ 18 = 5,44gallons Petrol left in tank/<i>Petrol oor in tenk</i> = 23 – 5,44 ✓ MA ✓ CA = 17,56 gallons Miles that can be travelled after Friday/<i>Myle wat nog gereis kan word na Vrydag</i> = 414 – 98 = 316 miles/myl Petrol left in tank/<i>Petrol oor in tenk</i> = 316 ÷ 18 = 17,56 gallons 1A travel distance 1RT trip distance 1MA multiplying 1CA number of trips 1MA dividing 1CA simplification 1MA subtracting 1CA simplification (8)		
5.2	$^{\circ}\text{C} = \frac{5}{9} (^{\circ}\text{F} - 32)$ $-7 = \frac{5}{9} (^{\circ}\text{F} - 32)$ $^{\circ}\text{F} = \frac{9}{5} \times -7 + 32$ $= 19,4$ $\approx 20^{\circ}\text{F}$		