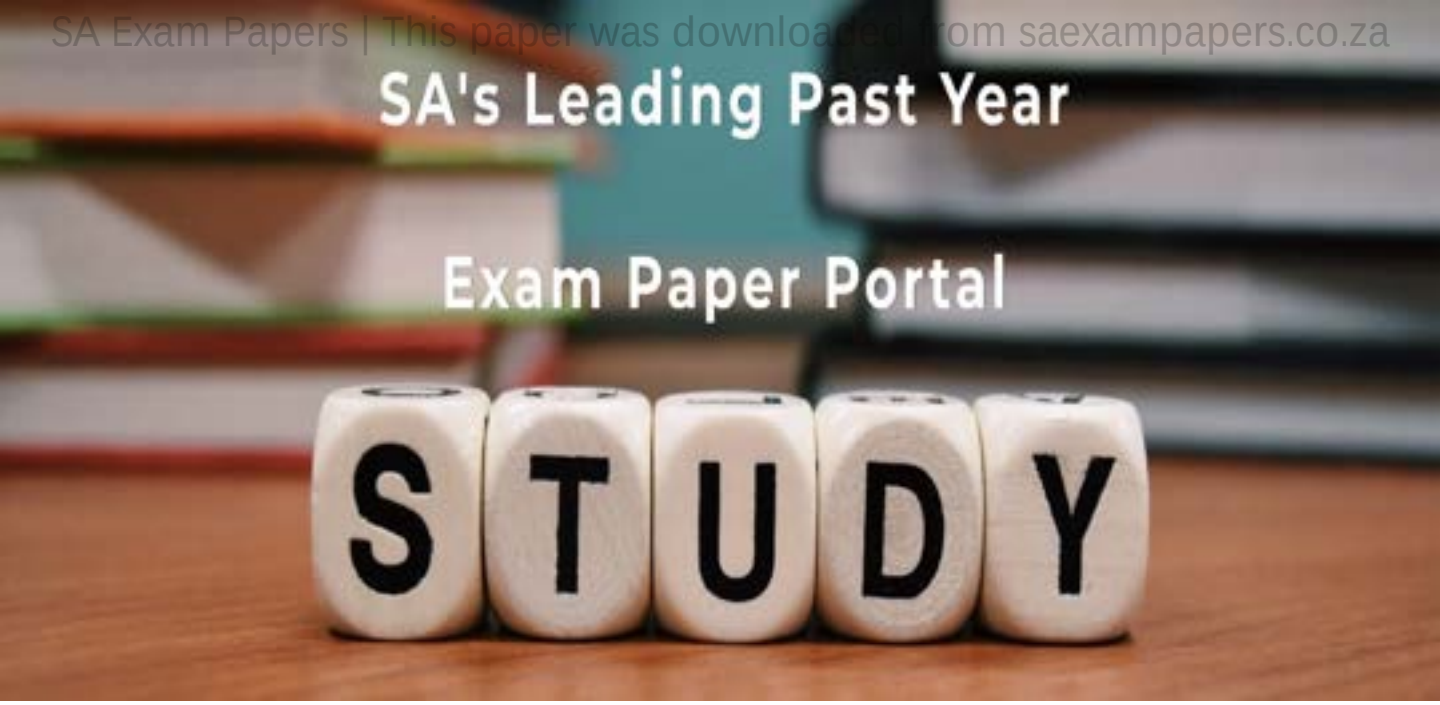

education

Department of Education
FREE STATE PROVINCE

PREPARATORY EXAMINATION
VOORBEREIDENDE EKSAMEN

GRADE/*GRAAD* 12

MATHEMATICAL LITERACY P2
WISKUNDIGE GELETTERDHEID V2

SEPTEMBER 2023

MARKS/*PUNTE*: 150

MARKING GUIDELINES/*NASIENRIGLYNE*

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/a graph/document/diagram/*Lees vanaf tabel/'n 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 constant accuracy/*Metode met volgehoue akkuraatheid*
NPU	No penalty for unit/*Geen penalisasie vir eenheid nie*

These marking guidelines consists of 13 pages.
Hierdie nasienriglyne bestaan uit 13 bladsye.

Please turn over/*Blaai om asseblief*

NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled) version.
- Consistent accuracy (CA) applies in ALL aspects of the marking guidelines; however, it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra item presented.
- Rounding is an independent mark.
- General principal of marking: If the candidate makes one mistake, he/she loses one mark.
- A conclusion mark can only be given if relevant calculations precedes it.

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.*
- *Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart neem en ekstra antwoorde gee, penaliseer vir elke ekstra item.*
- *Afronding is 'n onafhanklike punt.*
- *Die algemene beginsel van merk: as 'n leerder een fout maak, verloor hy/sy een punt.*
- *'n Gevolgtrekkingspunt kan slegs gegee word indien relevante berekeninge dit voorgaan.*

QUESTION/*VRAAG* 1 [31 MARKS/*PUNTE*]		**ANSWER ONLY FULL MARKS**	
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
1.1.1	✓C 72 cm ÷ 100 = 0,72 m ✓A	1C divide by 100 1A correct simplification (2)	M L1 E
1.1.2	✓MA 4 × 1,2 m = 4,8 m ✓A	1MA multiply by 4 1A correct simplification (2)	M L1 E
1.1.3	✓MA 35 cm + 35 cm = 70 cm✓A **OR/OF** ✓MA 35 × 2 = 70 cm ✓A	1MA adding two lengths 1A correct simplification (2)	M L1 E
1.1.4	7,0 mm ✓✓A	**[allow 1 mm on both sides/*laat 1mm weerskante toe*]** 2A correct measurement (2)	M L1 E
***1.1.5**	✓MA 3 × 2 = 6 ✓A	1MA multiplying correct numbers 1A correct simplification (2)	P L1 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
1.1.6 (a)	Total length of steel/*Totale lengte van staal* = 2,2 m + (2 × 0,72) m + (4 × 1,8) m ✓MA = 2,2 m + 1,44 m + 7,2 m = 10,84 m ✓CA	1MA adding all correct values 1CA final answer (2)	M L1 E
1.1.6 (b)	Number of side bars to be cut/*Aantal sybalke om te sny*: $\frac{3{,}8\text{ m}}{1{,}8\text{ m}}$ = 2,11✓A ≈ 2 ✓R	1A divide and simplification 1R rounding down (2)	M L1 E
1.2.1	✓A The **distance from the side** of the clock ✓A **through the centre** to the other side of the clock. ✓A *Middellyn is die direkte **afstand** van die een kant van die horlosie na die anderkant deur die **middelpunt***✓A **OR** The line that divides the clock into two equal parts.✓✓A *Die lyn wat die horlosie in twee gelyke dele verdeel.* .✓✓A	2A correct definition (2)	M L1 E
*1.2.2	D✓✓A	2A correct answer (2)	M L1 E
1.2.3	✓MA 09:45 – 08:00 = 01h45min ✓A 60 min + 45 min = 105 min ✓CA	1MA subtract times 1A correct elapsed time 1CA conversion to minutes **NPU** (3)	M L1 M
1.3.1	The route map shows the different roads between Johannesburg and Durban✓✓A *Die roetekaart toon die verskillende paaie tussen Johannesburg en Durban* ✓✓A **OR/*OF***	2A correct definition **OR** 2A correct definition	MP L1 E

	The route map shows the roads on which to travel to reach Durban/his destination.✓✓A *Die roetekaart toon die paaie waarop gereis moet word om Durban te bereik (sy eindpunt)*✓✓A	(2)	

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
1.3.2	N3✓✓A	2A correct road (2)	MP L1 E
1.3.3	Standerton Volksrust ✓✓A Pietermaritzburg	**Accept any TWO** 1A town 1 1A town 2 (2)	MP L1 E
1.3.4	Free State/*Vrystaat*✓✓A	2A correct province (2)	MP L1 E
***1.3.5**	0% ✓✓A	1A correct percentage (2)	P L1 E
		[31]	

QUESTION/*VRAAG* 2 [28 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation** *Verduideliking*	**T&L**
2.1.1	To tighten/fasten/loosen all screws properly. ✓✓A *Om alle skroewe behoorlik vas te draai/los te maak.* ✓✓A	2A correct function (2)	MP L1 M
2.1.2	Step 3 ✓ A Step 1 ✓ A Step 2 ✓ A **OR/*OF*** B ✓A C ✓A A ✓A	1A correct choice 1A correct choice 1A correct choice **OR** 1A correct choice 1A correct choice 1A correct choice (3)	MP L2 M
2.1.3	To allow for people of different heights to sit comfortably on the chair and let their feet rest on the footrest. ✓✓A *Om voorsiening te maak vir mense met verskillende lengtes om hulle voete te laat rus op voetrus.* ✓✓A **OR** To adjust or fit different counter levels. ✓✓A *Om by verskillende toonbankhoogtes te pas.*✓✓A	2A correct explanation (2)	MP L4 M
2.2.1	Strip Chart/Strip Map ✓✓A *Strookkaart* ✓✓A	2A correct name (2)	MP L1 E
2.2.2	Distance from Kroonstad to Vereeniging/ *Afstand van Kroonstad na Vereeniging* ✓RT ✓M (317 – 209) + 15 = 108 + 15 = 123 km✓CA	1RT reading (317 and 209) 1M subtracting and adding 1CA simplification	MP L2 M

	OR/*OF* ✓RT ✓M (246 – 138) + 15 = 123 km ✓CA	**OR/*OF*** 1RT reading (246 and138) 1M subtracting and adding 1CA simplification (3)	
2.2.3	N1 ✓A and/*en* N12 ✓A	1A correct road 1A correct road (2)	MP L1 E
2.2.4	3 ✓✓A	2A correct number (2)	MP L1 E

Q/*V*	Solution/*Oplossing*	Explanation *Verduideliking*	T&L
2.3.1	The map on Annexure B is not drawn to scale, whereas the provincial map is drawn according to the scale.✓✓A *Die kaart op Bylae B is nie volgens skaal geteken nie terwyl die provinsiale kaart is volgens skaal geteken.* ✓✓A **OR/OF** The map on Annexure B does not show accurate directions, whereas the provincial map actual directions are shown. ✓✓A *Die kaart op Bylae B toon nie rigtings akkuraat nie terwyl die provinsiale kaart word werklike rigtings getoon.* ✓✓A **OR/*OF*** Roads are shown as straight lines in the map on Annexure B, whereas in the provincial map they are not shown as straight lines.✓✓A *Paaie word op strookkaart as reguitlyne getoon terwyl provinsiale kaart nie reguitlyne wys nie.*✓✓A	2A reason 1 2A reason 2 2A reason 1 2A reason 2 2A reason 1 2A reason 2 (4)	MP L1 E
2.3.2	North East (NE) ✓✓A *Noordoos (NO)* ✓✓A	2A correct direction (2)	MP L2 M
2.3.3	<u>Bar scale</u> **53 mm = 100 km** ✓A Distance from Potchefstroom to Klerksdorp on map = **27 mm** ✓A <u>Distance in real life:</u> ✓MCA ✓CA $\frac{27\text{ mm}}{53\text{ mm}} \times 100\text{ km} = \mathbf{50{,}9\text{ km}}$	[allow 1 mm on both sides for all measurements/*laat 1mm weerskante toe vir alle metings*] 1A correct measurement 1A correct measurement 1MCA divide and multiply 1CA simplification	MP L4 D

	Distance on Annexure B = 55 km ✓RT Mr January is correct. ✓O *Grafiese skaal*: **53 mm = 100 km** ✓A *Afstand vanaf Potchefstroom na Klerksdorp op kaart:* **27 mm** ✓A *Afstand in werklikheid*: ✓MCA ✓CA $\frac{27\text{ mm}}{53\text{ mm}} \times 100\text{ km} = \mathbf{50{,}9\text{ km}}$ *Afstand op Bylae B* = 55 km✓ *Mnr. January is reg*✓O	1RT reading correct distance 1O correct deduction (6)	
		[28]	

QUESTION/*VRAAG* 3 [25 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation** *Verduideliking*	**T&L**
3.1.1	The *area* refers to the space enclosed by the perimeter of a figure.✓✓A *Die oppervlakte verwys na die ruimte ingesluit in die omtrek van 'n figuur*✓✓A **OR/OF** The amount of space occupied by an object.✓✓A *Die hoeveelheid ruimte wat deur 'n voorwerp opgeneem word.*✓✓A	2A correct definitions (2)	M L1 E
***3.1.2**	4 feet/*voet* = 4 × 30,48cm ✓C = 121,92cm ✓A 121,92 cm = 1,2192 m ✓C Area/*oppervlakte* = 1,2192 m × 1,2192 m✓SF = 1,486 m^2 = 1,49 m^2 ✓CA **OR/*OF*** Area/*oppervlakte* = 4ft × 4ft ✓SF = 16 ft^2 30,48 cm = 0,3048m ✓C ✓A ✓C Area/*oppervlakte* in m = (16 × 0,3048 × 0,3048)m^2 = 1,49 m^2 ✓CA	1C convert to cm 1A simplify 1C convert cm to m 1SF substitute into formula 1CA simplify and rounded 1SF substitute into formula 1C convert cm to m 1A multiply 16 1C comvert ft^2 to m^2 1CA simplify (5)	M L2 M
3.1.3 (a)	Area of triangle/*Oppervlakte van driehoek* $(\frac{1}{2} \times 60,96 \times 25,576\ cm^2)$✓SF = 779,55648 cm^2 ✓CA	1SF substitute 1CA simplification **NPR** (2)	M L2 M
3.1.3 (b)	Area of rectangle/*Oppervlakte van reghoek* 60,96 cm × 30,48 cm ✓SF = 1 858,0608 cm^2 ✓CA	1SF substitute 1CA simplification **NPR** (2)	M L2 E

3.1.3 (c)	Total area/*totale oppervlakte* ✓M = 779,55648 + 1 858,0608 + (464,5152×2) + (926,4396×3) + (1 248,4608×2) cm^2 ✓MCA = 8 842,88808 cm^2 ✓CA = 0,88 m^2✓C	**CA from 3.1.3 (a) & (b)** 1M multiplying with correct numbers 1MCA adding all values 1CA simplification 1C conversion **NPR** (4)	M L2 M

3.2.1	90 % volume is 9 090 ℓ So when 100 % full Volume = $\frac{100}{90}$ × 9 090ℓ ✓M = 10 100ℓ ✓CA 0,001 m^3 = 1ℓ 10 100 ℓ = 10,1 m^3 ✓C Radius: $\frac{3,40}{2}$ m = 1,70 m✓A Volume = 3,142 × (1,70 m)^2 × height 10,1 m^3 = 3,142 × (1,70 m)^2 × height✓SF Height = $\frac{10,1\ m^3}{9,08038\ m^3}$ ✓S = 1,112 m ✓CA *90 % volume is 9 090 ℓ wanneer 100 % vol*: Volume = $\frac{100}{90}$ × 9 090ℓ ✓M = 10 100ℓ ✓CA 0,001 m^3 = 1ℓ 10 100 ℓ = 10,1 m^3 ✓C Radius: $\frac{3,40}{2}$ m = 1,70 m✓A Volume = 3,142 × (1,70 m)^2 × hoogte	1M method finding volume for 100% 1CA simplify 1C conversion to m^3 1A calculating radius 1SF substitute 1S change the subject the subject of the formula 1CA simplify 1O deduction **NPR** (8)	M L4 D

	$10{,}1\ m^3 = 3{,}142 \times (1{,}70\ m)^2 \times$ hoogte✓SF Hoogte = $\frac{10{,}1\ m^3}{9{,}08038\ m^3}$ ✓S = 1,112 m ✓CA *Hoogte van leer wat sy in gedagte het is 1,1 m* *Die leer is nie hoog genoeg nie.*✓O		
***3.2.2**	To get into or out of the pool with ease.✓✓O *Om met gemak in en uit die swembad te klim.*✓✓O	2O correct explanation (2)	M L4 M
		[25]	

QUESTION/*VRAAG* 4 [31 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation *Verduideliking***	**T&L**
***4.1.1**	Interior/*binne* – 3✓✓A Exterior/*buite* – 2✓✓A	2A correct number 2A correct number (4)	MP L2 E
4.1.2	Left/*links* ✓✓A **OR/*OF*** West/*Wes* ✓✓	2A correct side OR 2A correct side (2)	MP L2 E
4.1.3	North Elevation/*Noordaansig*✓✓A	2O correct elevation (2)	MP L4 M
4.1.4 (a)	Laminated flooring/*Gelamineerde vloere*: ✓MA 49 × R245 = R12 005✓ CA Labour/*Arbeid*: R50 × 49 = R 2 450✓CA Total/*Totaal*: R 12 005 + R 2 450 = R 14 455✓CA	 1MA multiply correct values 1CA simplification 1CA labour cost 1CA total cost (4)	M/F L2 E
4.1.4 (b)	Tiles/*Teëls*: ✓MA $\frac{49}{13}$ = 3,769… ≈ 4 bags✓ R **OR/*OF*** ✓MA $\frac{49}{13} \times 5$ = 18,846….. $\frac{18,846}{5}$ = 3,7 … ≈ 4 bags/*sakke*✓R	 1MA dividing correct numbers 1R rounding up **OR** 1MA correct kg 1R rounding up (2)	M/F L2 E
4.1.5 (c)	Total tiles/*Totaal vir teëls*: ✓RT ✓MCA = (R95,99 × 49) + (4 × R60) + (11 × R65,00) + R2 500 = R4 703,51 + R240 +R715+ R2 500✓MCA = R8 158,51✓CA	**CA from 4.1.4 (b)** 1RT all costs 1MCA multiplying cost with numbers 1MCA adding all values 1CA simplification (4)	M/F L2 M

Q/*V*	Solution/*Oplossing*	Explanation *Verduideliking*	T&L
***4.2.1**	Option/Opsie 1: ✓MA $\frac{1\,690\text{ mm}}{506\text{ mm}} = 3{,}34$ ✓A ≈ 3✓R ✓MA $\frac{1\,355\text{ mm}}{451\text{ mm}} = 3{,}004$ ≈ 3✓ R Total number of boxes/*Totale aantal bokse*: ✓MCA 3 × 3 = 9 ✓CA	 1MA dividing length by length 1A simplification 1R rounded simplification 1MA dividing breadth by breadth 1R rounded simplification 1MCA multiplication 1CA no.of boxes (7)	MP L3 M
4.2.2	✓RT ✓M <u>Total Distance:</u> 6 × 55× 2 = 660 km✓CA <u>No. of litres:</u> $= \frac{660\text{ km}}{11\text{ km}/\ell}$ ✓MCA = 60 ℓ ✓CA <u>Total cost:</u> 60 ℓ × R25,97/ℓ = R 1 558,20✓CA **OR/OF** ✓RT Petrol for 1 trip = $\frac{55\text{ km}}{11\text{ km}/\ell}$ ✓M = 5 ℓ ✓CA Cost for 1 trip = 5 ℓ×R25,97/ℓ = R 129,85✓CA Total cost = R 129,85 × 6 × 2 ✓M = R 1 558,20✓CA	1RT all correct values 1M multiply by 2 1CA simplification 1MCA method of dividing 1CA simplification 1CA total cost 1RT all correct values 1M dividing 1CA simplification 1M multiplying by 2 1CA simplification (6)	M L3 D
		[31]	

QUESTION/*VRAAG* 5 [35 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation *Verduideliking***	**T&L**
5.1.1	$\text{BMI} = \frac{\text{mass}}{(\text{length}^2)} / \frac{massa}{(lengte)^2}$ ✓RT $44{,}1\ \text{kg/m}^2 = \frac{120\ \text{kg}}{(\text{length}^2)}$ ✓SF $\text{Length}^2/Lengte^2 = \frac{120\ \text{kg}}{44{,}1\ \text{kg}/m^2}$ ✓S = 2,72108843537✓CA Length/*Lengte* = 1,65m ✓R	1RT reading 120 kg 1SF substitute 1S change subject of formula 1CA simplify 1R correctly rounded (5)	M L3 D
***5.1.2**	✓A (a) Breakfast is exactly the same on day 1 and 2/ difference is at lunch *Ontbyt is presies dieselfde vir dag 1 en 2. Verskil is in middagete.* (b) **Lunch day 1/*Middagete dag 1:*** ✓RT ✓M = 1 565 kJ + 0 kJ + 30 kJ + 89 kJ +1 100 kJ =2 784 kJ ✓CA **Lunch day 2/*Middagete dag 2:*** ✓RT = (2 × 536 kJ) + 843 kJ + 0 kJ + 324 kJ = 2 239 kJ ✓CA The kJ value on day 1 is more than the kJ value of day 2.✓O *Die kJ waarde op dag 1 is meer as die kJ waarde op dag 2.* ✓O **OF/*OR*** The kJ value on day 2 is less than the kJ value on day 2/*Die kJ waarde op dag 2 is minder as die kJ waarde op dag 2.* ✓	1A kJ is the same for breakfast day 1 and day 2 1RT all correct values (except 0kJ) 1M adding 1CA simplification 1RT all correct values 1CA simplification 1O correct comparison **OR** 1O correct deduction (7)	M L4 M

5.1.3	100 g steak energy value = 1 054 kJ ✓RT ✓MA For 350 g steak = $\frac{350}{100}$ × 1 054 kJ = 3 689 kJ ✓CA	1RT correct value 1054 kJ 1MA divide with 100 and multiply by 1 054 kJ 1CA simplification (3)	M L2 M

Q/*V*	Solution/*Oplossing*	Explanation *Verduideliking*	T&L
5.2.1	A street map/*'n Straatkaart.* ✓✓A	2A correct name (2)	MP L1 E
5.2.2	✓A • Starting on the corner of Barnes and Markgraaf Streets and run South West • Down Markgraaf Str ✓A ✓A ✓A • At Selbourne street turn NW and • Then run straight to the corner of Selbourne street and 1st avenue ✓A ✓A • *Begin op die hoek van Barnes en Markgraaffstrate en hardloop Suid-wes* • *Af in Markgraafstraat.* ✓A ✓A ✓A • *By Selbourne Street draai NW* • *En hardloop dan reguit na die hoek van Selbourne straat en 1ste Laan.*✓A **OR:** • Starting on the corner of Barnes and Markgraaf Streets run North West ✓A • Down Barnes str ✓A. • Turn SW ✓ into 1st ave✓. • Continue straight onto 1st avenue until the corner of Selbourne and 1st avenue ✓A *Begin op die hoe van Barnes en Markgraafstrate en hardloop Noord-Wes af in Barnes Str. Draai Sw in 1ste Laan. Hou reguit aan met 1ste Laan tot by die hoek van Selbourne en 1ste Laan.*	1A direction South West 1A down Markgraaf Str 2A at Selbourne and NW 1A run straight **OR** 1A direction North West 1A Barnes Str 1A turn SW 1A 1st ave 1A run straight (5)	MP L3 M
5.2.3	South West (SW)/*Suidwes (SW)* ✓✓A	2A correct direction	MP L2

		(2)	E
5.2.4	The are both one-ways – they are going in opposite directions. ✓✓O *Beide is eenrigtingstrate – hulle gaan in teenoorgestelde rigtings* ✓✓O	2O correct reason (2)	M L4 D

5.2.5	From 17:05 to 17:20 is 15 min ✓A $\frac{15\text{ min}}{60} = 0{,}25$ hours ✓C Distance = speed × time Speed = $\frac{\text{Distance}}{\text{time}}$ ✓S = $\frac{1{,}291\text{ km}}{0{,}25\text{ h}}$ ✓SF = 5,164 km/h ✓CA *Van* 17:05 *tot* 17:20 *is* 15 min $\frac{15\text{ min}}{60} = 0{,}25$ ure ✓C *Afstand = spoed × tyd* Spoed = $\frac{\text{Afstand}}{\text{tyd}}$ = $\frac{1{,}291\text{ km}}{0{,}25\text{ h}}$ ✓SF = 5,164 km/h ✓CA	1A elapsed time 1C convert min to hour 1S change subject 1SF substitute 1CA simplification 1A elapsed time 1C convert min to hour 1S change subject 1SF substitute 1CA simplification (5)	M L3 M
5.4	(a) BS/*SK* ✓✓A (b) GSBT/*GKBT* ✓✓CA	2A correct choice 2CA correct outcome (4)	P L2 E
		[35]	

TOTAL/*TOTAAL*: 150

Notes to Paper 2 Marking Guideline: September 2023		
1.1.5	Listing of all outcomes	1 mark
1.2.2	Accept B No penalty for writing B and D	2 marks
1.3.5	0 (only)	1 mark
3.1.2	4 feet × 4 feet	1 mark
3.2.2	Accept: • Safety reasons	2 marks
4.1.1	Accept: ✓✓ ✓✓ 3 + 2 = 5 2 + 3 = 5 not accepted 5 only not accepted	4 marks
4.2.1	Option/Opsie 2: $\frac{1\,690\text{ mm}}{451\text{ mm}} = 3{,}75$ ≈ 3 $\frac{1\,355}{506} = 2{,}678$ ≈ 2 Total number of boxes/Totale aantal bokse: 3 × 2 = 6 boxes	Max of 4 marks
5.1.2(a)	Accept: Comparing of: Day 1: 1327 kJ Day 2: 1327 kJ	1 mark