



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE/ NASIONALE SENIOR SERTIFIKAAT

GRADE 12

MATHEMATICAL LITERACY P2/ WISKUNDIGE GELETTERDHEID V2

NOVEMBER 2023

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 150

Symbol/Kode	Explanation/Verduideliking
MA	Method with accuracy/ <i>Metode met akkuraatheid</i>
MCA	Method with constant accuracy/ <i>Metode met volgehoue akkuraatheid</i>
CA	Consistent accuracy/ <i>Volgehoue akkuraatheid</i>
A	Accuracy/ <i>Akkuraatheid</i>
C	Conversion/ <i>Herleiding</i>
S	Simplification/ <i>Vereenvoudiging</i>
RT	Reading from a table/a graph/document/diagram/ <i>Lees vanaf tabel/grafiek/diagram</i>
SF	Correct substitution in a formula/ <i>Korrekte vervanging in formule</i>
O	Opinion/Explanation/Reasoning / <i>Opinie/Verduideliking/redenasie</i>
P	Penalty, e.g. for no units, incorrect rounding off, etc./ <i>Penalisinging bv. vir geen eenhede/verkeerde afronding, ens.</i>
R	Rounding off/ <i>Afronding</i>
NPR	No penalty for rounding/ <i>Geen penalisinging vir afronding nie</i>
NPU	No penalty for omitting the unit, but a wrong unit is penalised. / <i>Geen penalisasie indien die eenheid uitgelos is nie, maar 'n verkeerde eenheid word wel gepenaliseer.</i>
AO	Answer only/ <i>Slegs antwoord</i>
RCA	Rounding consistent with accuracy/ <i>Afronding met volgehoue akkuraatheid</i>

**These marking guidelines consist of 18 pages.
Hierdie nasienriglyne bestaan uit 18 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.
- Rounding is an independent mark.
- A conclusion mark can only be given if relevant calculations precede it.
- No penalty for rounding (NPR) if the first decimal is correct.

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 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 nasienbeginsel is dat indien 'n kandidaat een fout maak en daarna voortgaan met korrekte wiskunde, dat die kandidaat slegs een punt verloor*
- *Afronding tel as 'n onafhanklike punt*
- *'n Gevolgtrekkingspunt kan slegs gegee word indien relevante berekeninge dit voorgaan.*
- *Geen penalisering vir ronding (NPR) as die eerste desimaal korrek is nie.*

NOTE: Questions marked with * refers to the notes.

Questions where the numbers are encircled are the ones where we have a tolerance range.

QUESTION/VRAAG 1 [25 MARKS/PUNTE] Answer Only AO - full marks			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
1.1.1*	B. ✓✓ A	2A explanation (2)	MP L1 E
1.1.2*	E. ✓✓ A	2A explanation (2)	M L1 E
1.1.3*	A. ✓✓ A	2A explanation (2)	MP L1 E
1.1.4*	F. ✓✓ A	2A explanation (2)	M L1 E
1.2.1*	3 ✓✓ A	2A number of streets (2)	MP L1 E
1.2.2*	Iffley ✓✓RT	2RT correct street (2)	MP L1 E

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
1.2.3*	$\begin{aligned} & \quad \quad \quad \checkmark RT \quad \quad \quad \checkmark RT \\ \text{Tot. dist.} &= 980 \text{ m} + 435 \text{ m} + 870 \text{ m} + 1\,100 \text{ m} \\ &= 3\,385 \text{ m} \quad \checkmark CA \end{aligned}$	1RT 1 st 2 correct values 1RT 2 nd set of values 1CA distance (3)	MP L1 M
1.3.1*	3 ✓✓ A	2A number of types of screws (2)	MP L1 E
1.3.2* (a)	F ✓✓ A	2A correct letter (2)	MP L1 E
1.3.2 (b)	4 ✓✓ A	2A correct number (2)	MP L1 E
1.3.3*	Allen key. /Allensleutel ✓✓ A	2A correct tool (2)	MP L1 E
1.3.4*	Chair arms/ ✓✓ A Stoelarms OR/OF F	2A correct item (2)	MP L1 E
		[25]	

QUESTION/VRAAG 2 [35 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
2.1.1	<p>A layout plan describes the physical arrangement of all structures that consume space within a facility. ✓✓ A <i>'n Uitlegplan toon die rangskikking van al die strukture, stoele ens. wat die ruimte van die lokaal beslaan.</i></p> <p>OR/OF</p> <p>✓✓ A A layout plan is a top view that shows the arrangement of features / structures / location or position of items. <i>'n Uitlegplan is die bo-aansig wat die rangskikking van die voorwerpe/ strukture / ligging of posisie van items aantoon.</i></p>	<p>2A correct definition</p> <p>(2)</p>	MP L1 E
2.1.2	20 ✓✓ A	<p>2A number of seats</p> <p>(2)</p>	MP L1 E
2.1.3	<p>C ✓✓ A</p> <p>OR/OF</p> <p>The screen is opposite the door leading into the room/ <i>Die skerm is oorkant die ingangsdeur.</i></p>	<p>2A correct option</p> <p>(2)</p>	MP L1 M
2.1.4	<p>✓✓ O North table is narrow or small or limited space./<i>Noordtafel is baie nou of te min spasie.</i></p> <p>OR/OF</p> <p>✓✓ O Plants will block or obscure the view of participants seated there/<i>Plante sal die uitsig van deelnemers wat hier sit belemmer.</i></p>	<p>2O acceptable reason</p> <p>(2)</p>	MP L4 E
2.1.5* (a)	12,7 cm or 127 mm ✓✓ A	<p>2A measured value</p> <p>Accept: 12,4 – 12,8 cm</p> <p>(2)</p>	MP L2 E
2.1.5* (b)	<p>GP, MP, NC: 12,7 cm : 12 m ✓ MCA</p> <p>12,7 : 1 200 ✓ C</p> <p>1: 94,49 ✓ CA</p> <p>OR/OF</p> <p>FS, NW, WC 12,4 cm : 12 m ✓ MCA 12,4 : 1 200 ✓ C 1: 96,77 ✓ CA</p>	<p>CA from 2.1.5(a)</p> <p>1MCA correct order of the ratio 1C conversion</p> <p>1CA simplified unit ratio</p> <p>OR/OF</p> <p>1MCA correct order of the ratio 1C conversion 1CA simplified unit ratio</p>	MP L2 M

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p>OR/OF EC, KZN, LP 12,5 cm : 12 m ✓ MCA 0,125 : 12 ✓ C 1 : 96 ✓ CA</p> <p>OR/OF 125 mm : 12 m ✓ MCA 125 : 12 000 ✓ C 1 : 96 ✓ CA</p>	<p>1MCA correct order of the ratio 1C conversion 1CA simplified unit ratio</p> <p>OR/OF 1MCA correct order of the ratio 1C conversion 1CA simplified unit ratio NPR</p> <p style="text-align: right;">(3)</p>	
2.2*	<p>Half the table length/<i>halwe tafel lengte</i> = 145 cm ✓ A</p> <p>Pack length wise along table's top length/ <i>lengte teen lengte</i>: $\frac{145 \text{ cm}}{36,4 \text{ cm}} = 3,98 \quad \checkmark \text{ MA}$ $\approx 3 \text{ packs./pakke.} \quad \checkmark \text{ R}$</p> <p>And the width against the table width / <i>breedte teen breedte</i> $\frac{49 \text{ cm}}{24,2 \text{ cm}} = 2,02 = 2 \text{ packs./pakke} \quad \checkmark \text{ A}$</p> <p>Number that can be packed / <i>getal wat gepak kan word</i> $= 3 \times 2 = 6 \text{ packs/pakke} \quad \checkmark \text{ MA} \quad \checkmark \text{ CA}$</p> <p>But/<i>Maar</i> $36,4 \times 3 = 109,2 \text{ cm}$ And/<i>en</i> $145 \text{ cm} - 109,2 \text{ cm} = 35,8 \text{ cm}$ Pack width wise along table's top length / <i>Breedte teen lengte</i> $\frac{35,8 \text{ cm}}{24,2} = 1,479338843 \approx 1 \text{ pack} \quad \checkmark \text{ A}$</p> <p>Length against the width / <i>lengte teen breedte</i> $\frac{49 \text{ cm}}{36,4} = 1,346153846 \approx 1 \text{ pack}$</p> <p>Total number of packs / <i>Totale getal pakke</i> $= 6 + 1 = 7 \quad \checkmark \text{ CA}$</p> <p>∴ The maximum is 7 packs / <i>Maksimum is 7 pakke</i></p>	<p>1A calculating half length</p> <p>1MA dividing</p> <p>1R rounding down</p> <p>1A simplification</p> <p>1MA multiplying 1CA correct number of packs</p> <p>1A extra pack</p> <p>1CA correct number of packs</p> <p style="text-align: right;">(8)</p>	MP L3 D
2.3.1*	<p style="text-align: center;">✓✓ A</p> <p>South East OR SE./ <i>Suidoos OF SO</i></p>	<p>2A direction</p> <p style="text-align: right;">(2)</p>	MP L2 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
2.3.2	<p style="text-align: center;">✓✓ A</p> <p>There is no relationship (or ratio) between distances on a map and the corresponding distance on the ground. <i>Daar is geen verwantskap tussen die afstande op die kaart en die ooreenstemmende afstand op die grond nie.</i></p> <p style="text-align: center;">OR/OF</p> <p style="text-align: center;">✓✓ A</p> <p>Distances on map are not accurate therefore one should not measure the length on the document and then expect to be able to calculate the real-life distance from it. <i>Afstande op die kaart is nie akkuraat nie gevolglik kan jy nie die afstande op die kaart meet en verwag om die korrekte afstand in werklikheid uit te werk nie.</i></p> <p style="text-align: center;">OR/OF</p> <p style="text-align: center;">✓✓ A</p> <p>The map is a free hand drawing/ rough sketch since scale was not used when it was drawn <i>Die kaart is 'n vryhand tekening / rofwerkskets aangesien geen skaal gebruik was om dit te teken nie.</i></p>	<p>2A correct statement</p> <p style="text-align: right;">(2)</p>	<p>MP L1 M</p>
2.3.3	<p style="text-align: center;">✓RT ✓RT</p> <p>Tram/Kloof Street and Albert Street. <i>Tram/Kloofstraat en Albertstraat</i></p>	<p>1RT Tram or Kloof 1RT Albert</p> <p style="text-align: right;">(2)</p>	<p>MP L2 M</p>
2.3.4	<p>0 ✓✓ A</p> <p style="text-align: center;">OR/OF</p> <p>Impossible/ none / no chance <i>Onmoontlik/ nul / geen kans</i></p>	<p>2A correct probability</p> <p style="text-align: right;">(2)</p>	<p>P L2 E</p>
2.3.5	<p>Different <u>roads</u>/routes that lead <u>to the hotel</u>. ✓✓ O <i>Verskillende <u>roetes/paaie</u> wat <u>na die hotel</u> toe gaan.</i></p> <p style="text-align: center;">OR/OF</p> <p>The <u>streets</u> are possible entry points for <u>conference attendees</u>. ✓✓ O <i>Die <u>strate</u> is die moontlike ingange punte vir die <u>konferensie gangers</u>.</i></p> <p style="text-align: center;">OR/OF</p> <p style="text-align: center;">✓✓ O</p> <p>For getting <u>direction</u> easily to the <u>destination</u>. <i>Dit vergemaklik <u>rigting</u> aanwysings na die <u>bestemming</u>.</i></p>	<p>2O reason</p> <p style="text-align: right;">(2)</p>	<p>MP L4 M</p>

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
2.3.6	<p>Arrival time / <i>Aankomstyd</i> \checkmark MA \checkmark A $= 04:55 + 10 \text{ min} + 20 \text{ min} + 5 \text{ min}$ $= 05:30$ \checkmark CA</p> <p style="text-align: right;">\checkmark O</p> <p>The receptionist will be on time for work. <i>Sy sal betyds wees.</i></p> <p>OR/OF</p> <p>Duration of time from home to work /<i>Duur van tyd van huis tot werk</i> $= 10 \text{ min} + 20 \text{ min} + 5 \text{ min} = 35 \text{ min}$ \checkmark A Arrival time/ <i>Aankomstyd.</i> $04:55 + 00:35$ \checkmark MA $= 05:30$ \checkmark CA</p> <p>The receptionist will be on time for work. \checkmark O <i>Sy sal betyds wees.</i></p> <p>OR/OF</p> <p>Duration to reach hotel/ <i>Duur om die hotel te bereik</i> $= 05:30 - 04:55 = 35 \text{ min}$ \checkmark MA</p> <p>Duration of time from home to work /<i>Duur van tyd van huis tot werk</i> \checkmark MA \checkmark A $10 \text{ min} + 20 \text{ min} + 5 \text{ min} = 35 \text{ min}$</p> <p>Yes she will reach the hotel on time./ <i>Sy sal betyds wees</i> \checkmark O</p> <p>OR/OF</p> <p>$4:55 + 0:20 = 05:15$ \checkmark A $05:15 + 0:10 = 05:25$ \checkmark MA $05:25 + 0:05 = 05:30$ \checkmark CA She will arrive on time/ <i>Sy sal betyds wees</i> \checkmark O</p> <p>OR/OF</p> <p>\checkmark A \checkmark MA $05:30 - 5 \text{ mins} - 20 \text{ mins} - 10 \text{ mins}$ $= 04:55$ \checkmark CA The receptionist will be on time for work./ <i>Sy sal betyds wees</i> \checkmark O</p>	<p>1MA adding the time 1A all the values</p> <p>1CA arrival time</p> <p>1O verification</p> <p>OR/OF</p> <p>1A all the values</p> <p>1MA adding time</p> <p>1CA arrival time</p> <p>1O verification</p> <p>OR/OF</p> <p>1MA subtracting time</p> <p>1MA adding all values 1A simplification</p> <p>1O verification</p> <p>OR/OF</p> <p>1A all the values 1MA adding time 1CA arrival time</p> <p>1O verification</p> <p>OR/OF</p> <p>1A all the values 1MA subtracting time 1CA departure time 1O verification</p> <p style="text-align: right;">(4)</p>	<p>MP L4 M</p>
		[35]	

QUESTION/VRAAG 3 [33 MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
3.1.1	Number of eggs/ <i>Getal eiers</i> $= 2,7 \times 1\,000\,000 \quad \checkmark\text{MA}$ $= 2\,700\,000 \quad \checkmark\text{A}$ OR/OF Two million seven hundred thousand/ <i>Twee miljoen sewe honderd duisend</i>	1MA multiply by 1 000 000 1A correct answer AO (2)	M L1 E
3.1.2	Total mass/ <i>Totale massa</i> $= 2,375 \text{ kg} + 1,2 \text{ kg} + \left(\frac{750}{1\,000}\right) \text{kg} \quad \checkmark\text{C} \quad \checkmark\text{MA}$ $= 4,325 \text{ kg} \quad \checkmark\text{CA}$	1C conversion 1MA adding all the mass 1CA total mass in kg (3)	M L2 M
3.2.1	Volume = $30 \text{ cm} \times 30 \text{ cm} \times 60 \text{ cm} \quad \checkmark\text{SF}$ $= 54\,000 \text{ cm}^3 \quad \checkmark\text{CA}$ Total / <i>Totale</i> volume = $\frac{54\,000}{1\,000\,000} \text{ m}^3 \times 12 \quad \checkmark\text{MA}$ $= 0,648 \text{ m}^3 \quad \checkmark\text{CA}$ OR/OF Volume = $0,3 \text{ m} \times 0,3 \text{ m} \times 0,6 \text{ m} \quad \checkmark\text{C} \quad \checkmark\text{SF} \quad \checkmark\text{MA}$ $= 0,054 \text{ m}^3 \quad \checkmark\text{CA}$ Total / <i>Totale</i> volume = $0,054 \text{ m}^3 \times 12$ $= 0,648 \text{ m}^3 \quad \checkmark\text{CA}$ OR/OF Total volume in $\text{m}^3 = 12(0,3 \times 0,3 \times 0,6) \quad \checkmark\text{MA} \quad \checkmark\text{C} \quad \checkmark\text{SF} \quad \checkmark\text{CA}$ $= 0,648 \quad \checkmark\text{CA}$	1SF substitution into formula 1CA volume of the hole 1C conversion factor 1MA multiply by 12 posts 1CA simplification OR/OF 1C conversion 1SF substitution 1MA multiply converted values 1CA simplification 1CA simplification for 12 posts OR/OF 1MA multiply by 12 posts 1C conversion 1SF substitution 1CA simplify bracket 1CA simplification (5)	M L3 D
3.2.2	The post's volume will take some volume of the concrete. $\checkmark\checkmark\text{O}$ <i>Die pilare se volume sal van die volume beton opneem.</i> OR/OF The posts will take up <u>space</u> in the <u>hole</u> . / <i>Die pilare neem spasië op in die gat.</i>	2O opinion (2)	M L4 M

Q/V	Solution/oplossing	Explanation/Verduideliking	T/L
3.2.3*	<p>5,5 bags of cement make/sakke sement maak 0,75 m³ For 1 m³ the cement / Vir 1 m³ is die sement $= \frac{5,5}{0,75} \checkmark MA = 7,33.. \text{ bags /sakke } \checkmark A$</p> <p>But 1 bag cement mix with 2 wheelbarrows of sand Maar 1 sak sement meng met 2 kruise sand</p> <p>Number of wheelbarrows of sand Getal kruise sand $= 7,333... \times 2 = 14,666.. \checkmark CA$</p> <p>Mass of the sand / Massa sand = 102 × 14,6666... $= 1 496 \text{ kg } \checkmark CA$</p> <p>OR/OF</p> <p>Sand needed for 0,75 m³ concrete Sand nodig vir 0,75 m³ beton $= 5,5 \times 2 \checkmark MA$ = 11 wheel barrows /kruise $\checkmark A$</p> <p>Mass of sand need for 0,75 m³ of concrete Massa sand nodig vir 0,75 m³ beton $= 11 \times 102 \text{ kg } \checkmark MCA$ $= 1 122 \text{ kg } \checkmark CA$</p> <p>Mass of sand for 1 m³ the concrete Massa van sand vir 1m³ beton $= 1 122 \text{ kg } \times \frac{1}{0,75} \checkmark MA$ $= 1 496 \text{ kg } \checkmark CA$</p> <p>OR/OF</p> <p>For /Vir 0,75 m³: 5,5 × 50 = 275 kg cement/semment $\checkmark MA \quad \checkmark CA$ 1 m³ : 275 ÷ 0,75 = 366,666.. kg cement/semment</p> <p>Mixing ratio / Meng verhouding 1 bag/sak : 2 wheelbarrows sand</p> <p>Cement/ semment 50 kg : 204 kg sand $366,66 : n$</p> <p>$n = \frac{366,66}{50} \times 204 \checkmark MCA$ $= 1 496 \text{ kg } \checkmark CA \quad \checkmark MA$</p>	<p>1MA working with ratio 1A number of bags</p> <p>1MA multiplying by 2 1CA number of wheelbarrows 1MA multiply with mass 1CA simplification</p> <p>OR/OF</p> <p>1MA working with ratio 1A number of wheelbarrows</p> <p>1MCA multiplying by mass 1CA simplification</p> <p>1MA dividing by 0,75 1CA simplification</p> <p>OR/OF</p> <p>1MA dividing by 0,75 1CA simplification</p> <p>1A mass of wheelbarrows</p> <p>1MCA multiplying by mass 1MA working with ratio 1CA simplification</p>	<p>M L3 D</p>

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	<p>OR/OF</p> <p style="text-align: right;">✓MCA</p> $5,5 \times 102 \text{ kg} = 561 \text{ kg} \quad \checkmark\text{MA} \quad \checkmark\text{A}$ <p>So $561 \text{ kg} \times 2 = 1\,122 \text{ kg}$.</p> $0,75 \text{ m}^3 \text{ is } 1\,122 \text{ kg} \quad \checkmark\text{CA}$ <p>So: 1 m^3 will be $= \frac{1\,122}{0,75} \quad \checkmark\text{MA}$</p> $= 1\,496 \text{ kg} \quad \checkmark\text{CA}$ <p>OR/OF</p> <p>$5,5$ bags cement/sakke sement is $0,75 \text{ m}^3 \quad \checkmark\text{MA}$</p> $0,75 \text{ m}^3 \div 5,5 = 0,1363636\dots \text{ m}^3 \text{ per bag /sak} \quad \checkmark\text{A}$ $1 \text{ m}^3 \div 0,13636\dots = 7,333\dots \text{ bags/sakke}$ <p>Wheelbarrows/ Kruywaens $= 7,333\dots \times 2 \quad \checkmark\text{MA}$</p> $= 14,666\dots \quad \checkmark\text{CA}$ <p>Mass / massa $= 14,666\dots \times 102 \text{ kg} \quad \checkmark\text{MA}$</p> $= 1\,496 \text{ kg} \quad \checkmark\text{CA}$ <p>OR/OF</p> <p>Mass/massa in kg $= \frac{102}{0,75} \times (5,5 \times 2) \quad \checkmark\text{MA} \quad \checkmark\text{MA}$</p> $= 136 \times 11 \quad \checkmark\text{A} \quad \checkmark\text{CA}$ $= 1\,496 \quad \checkmark\text{CA}$	<p>1MCA multiplying by mass 1MA working with ratio 1A number of wheelbarrows</p> <p>1CA simplification 1MA dividing by 0,75 1CA simplification</p> <p>OR/OF</p> <p>1MA working with ratio</p> <p>1A number of bags</p> <p>1MA multiplying by 2 1CA number of wheelbarrows</p> <p>1MA multiply with mass 1CA simplification</p> <p>OR/OF</p> <p>3MA marks ratio, $\times 2$, \times mass 1A bags 2CA simplification & final answer</p> <p style="text-align: right;">(6)</p>	
3.3.1	<p>Area of rectangle/ <i>Opp. van reghoek</i></p> $= 1,6 \text{ m} \times 125 \text{ mm} \quad \checkmark\text{SF}$ $= 160 \text{ cm} \times 12,5 \text{ cm} \quad \checkmark\text{C}$ $= 2\,000 \text{ cm}^2$ <p>Total surface area/ <i>Totale oppervlakte</i> $\quad \checkmark\text{MA}$</p> $= 2\,000 \text{ cm}^2 \times 2 \text{ sides/kante} \times 12 \text{ posts/pilare}$ $= 48\,000 \text{ cm}^2 \quad \checkmark\text{CA}$ <p>OR/OF</p> <p>Area of one face / <i>Opp. van een aansig</i></p> $= \left(\frac{125}{10}\right) \text{ cm} \times (1,6 \times 100) \text{ cm} \quad \checkmark\text{C} \quad \checkmark\text{SF}$ $= 2\,000 \text{ cm}^2$ <p>Area of all the posts / <i>Opp. van al die pilare</i></p> $= 2\,000 \text{ cm}^2 \times (2 \times 12) \quad \checkmark\text{MA}$ $= 48\,000 \text{ cm}^2 \quad \checkmark\text{CA}$	<p>1SF substitution</p> <p>1C converting both</p> <p>1MA multiply by 2 and 12</p> <p>1CA simplification</p> <p>OR/OF</p> <p>1C converting both 1SF substitution</p> <p>1MA multiply by 2 and 12</p> <p>1CA simplification</p>	<p>M L2 M</p>

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p>OR/OF \checkmark SF \checkmark C $A = 12,5 \text{ cm} \times 160 \text{ cm} \times 2 \times 12 \checkmark$MA $= 48\,000 \text{ cm}^2 \checkmark$CA</p> <p>OR/OF $\frac{125}{1\,000} = 0,125 \text{ m}$ $\therefore \text{Area} = \text{length} \times \text{width} / \text{lengte} \times \text{breedte}$ $= 1,6 \text{ m} \times 0,125 \text{ m} \checkmark$SF $= 0,2 \text{ m}^2 (2 \times 12) \checkmark$MA $= 4,8 \text{ m}^2 \times 10\,000 \checkmark$C $= 48\,000 \text{ cm}^2 \checkmark$CA</p> <p>OR/OF \checkmarkSF Area of rectangle = $125 \text{ mm} \times (1,6 \times 1\,000)$ $\text{Opp. Van reghoek} = 125 \text{ mm} \times 1\,600 \text{ mm}$ $= 200\,000 \text{ mm}^2$ $\text{In cm}^2 = 200\,000 \div 100 = 2\,000 \text{ cm}^2 \checkmark$C $\text{Total surface area} = 2\,000 \text{ cm}^2 \times 12 \times 2 \checkmark$MA $\text{Totale buite opp.} = 48\,000 \text{ cm}^2 \checkmark$CA</p>	<p>OR/OF 1C converting both 1SF substitution 1MA multiply by 2 and 12 1CA simplification</p> <p>OR/OF 1SF substitution 1MA multiply by 2 and 12 1C converting both 1CA simplification</p> <p>OR/OF 1SF substitution 1C converting both 1MA multiply by 2 and 12 1CA simplification</p> <p style="text-align: right;">(4)</p>	
3.3.2	<p>Area of the rectangular part / <i>Opp. van reghoekige deel</i> \checkmarkSF $= (15,24 \text{ cm} \times 2,5 \text{ cm}) \times 4$ $= 38,1 \text{ cm}^2 \times 4 = 152,4 \text{ cm}^2 \checkmark$CA</p> <p>Area of the 4 top triangles/ <i>Opp. van 4 driehoeke</i> $= (\frac{1}{2} \times \text{base} \times \text{height}) \times 4 \checkmark$A $= (\frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm}) \times 4 \checkmark$SF $= 59,8932 \text{ cm}^2 \times 4 = 239,5728 \text{ cm}^2 \checkmark$CA</p> <p>Total area of 1 post cap / <i>Totale opp. van 1 pilaardop</i> $= 152,4 \text{ cm}^2 + 239,5728 \text{ cm}^2 = 391,97 \text{ cm}^2$</p> <p>Total area for 12 posts/ <i>Totale opp. vir die 12 pilare</i> $= 391,9728 \text{ cm}^2 \times 12 \checkmark$A $\approx 52\,704 \text{ cm}^2 \checkmark$MCA</p> <p>VALID/ GELDIG \checkmarkO</p>	<p>CA post's area from 3.3.1</p> <p>1SF substitution 1CA area of 4 rectangles</p> <p>1A multiply 4 1SF substitution 1CA simplification</p> <p>1A multiply 12 1MCA adding two areas 1O verification</p>	M L4 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	<p>OR/OF Area of the triangle/ <i>Opp. van driehoek</i> $= (\frac{1}{2} \times \text{base} \times \text{height})$ $= (\frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm}) \checkmark \text{SF} = 59,8932 \text{ cm}^2 \checkmark \text{CA}$</p> <p>Area of the rectangle / <i>Opp. van reghoekige deel</i> $= (15,24 \text{ cm} \times 2,5 \text{ cm}) \checkmark \text{SF} = 38,1 \text{ cm}^2 \checkmark \text{CA}$</p> <p>Area of one face / <i>Opp. van een aansig</i> $= 59,8932 \text{ cm}^2 + 38,1 \text{ cm}^2 = 79,9932 \text{ cm}^2$</p> <p>Total Area/ <i>Totale opp.</i> $= 79,9932 \text{ cm}^2 \times 4 = 391,9728 \text{ cm}^2 \checkmark \text{A}$</p> <p>Area for 12 caps/ <i>Opp. van 12 pilaardoppe</i> $= 391,9728 \text{ cm}^2 \times 12 = 4703,6736 \text{ cm}^2 \checkmark \text{A}$</p> <p>Total area to be painted/ <i>Totale opp. om te verf</i> $= 1703,6736 \text{ cm}^2 + 48000 \text{ cm}^2$ $= 52\,703,6736 \text{ cm}^2 \checkmark \text{MCA}$ $\approx 52\,704 \text{ cm}^2 \checkmark \text{O}$ VALID/ <i>GELDIG</i> $\checkmark \text{O}$</p> <p>OR/OF</p> <p>Area of posts / <i>Pilare se opp.</i> $= 48\,000 \text{ cm}^2$</p> <p>Area of all caps (rectangular part)/ <i>Opp. pilaardop (reghoekige deel)</i> $= (15,24 \text{ cm} \times 2,5 \text{ cm}) \times 4 \times 12 \checkmark \text{SF}$ $= 1828,8 \text{ cm}^2 \checkmark \text{CA}$</p> <p>Area of all caps (triangular part)/ <i>Opp. pilaardop (driehoekige deel)</i> $\checkmark \text{SF}$ $= \frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm} \times 4 \times 12 \checkmark \text{A}$ $= 2874,8736 \text{ cm}^2 \checkmark \text{CA} \checkmark \text{A}$</p> <p>Total area / <i>Totale opp.</i> $= 1828,8 \text{ cm}^2 + 2\,874 \text{ cm}^2 + 48\,000 \text{ cm}^2$ $= 52\,703,67 \text{ cm}^2 \approx 52\,704 \text{ cm}^2 \checkmark \text{MCA}$</p> <p>VALID/ <i>GELDIG</i> $\checkmark \text{O}$ OR/OF</p>	<p>OR/OF</p> <p>1SF substitution 1CA area of triangle</p> <p>1SF substitution 1CA simplification</p> <p>1A multiply 4</p> <p>1A multiply 12</p> <p>1MCA adding two areas 1O verification</p> <p>OR/OF</p> <p>1SF substitution 1CA simplification</p> <p>1SF substitution 1A multiply 4 1A multiply 12 1CA area of triangle</p> <p>1MCA adding two areas</p> <p>1O verification</p>	

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	<p>Area cap triangle /Opp. pilaardop driehoek $= \frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm}^2 \quad \checkmark\text{SF}$ $= 59,8932 \text{ cm}^2 \quad \checkmark\text{CA}$ So: $59,8932 \times 4 = 239,5728 \text{ cm}^2$ $239,5729 \text{ cm}^2 \times 12 = 2\,874,8736 \text{ cm}^2$</p> <p>Area rectangle/ Reghoekige opp. = $15,24 \text{ cm} \times 2,5 \text{ cm} \quad \checkmark\text{SF}$ $= 38,1 \text{ cm}^2 \quad \checkmark\text{CA}$ So: $38,1 \text{ cm}^2 \times 4 = 152,4 \text{ cm}^2 \quad \checkmark\text{A}$ $152,4 \text{ cm}^2 \times 12 = 1\,828,8 \text{ cm}^2 \quad \checkmark\text{A}$</p> <p>Total area = $1828,8 \text{ cm}^2 + 2\,874 \text{ cm}^2 + 48\,000 \text{ cm}^2$ Totale opp. = $5\,2703,67 \text{ cm}^2$ $\approx 5\,2704 \text{ cm}^2 \quad \checkmark\text{MCA}$</p> <p>VALID/ GELDIG $\checkmark\text{O}$</p> <p>OR/OF Total area to be painted / Opp. om te verf in cm^2 $\checkmark\text{A} \quad \checkmark\text{A} \quad \checkmark\text{SF} \quad \checkmark\text{SF}$ $= (12 \times 4 \times 0,5 \times 15,24 \times 7,86) + (12 \times 4 \times 15,24 \times 2,5)$ $\checkmark\text{CA} \quad \checkmark\text{CA}$ $= 2\,874,8736 + 1\,828,8$ $= 4\,703,6736$ $= 4\,704$ Posts + Caps = $48\,000 + 4\,704$ $= 52\,704 \quad \checkmark\text{MCA}$</p> <p>VALID/ GELDIG $\checkmark\text{O}$</p>	<p>1SF substitution 1CA area of triangle</p> <p>1SF substitution 1CA simplification</p> <p>1A multiply 4 1A multiply 12</p> <p>1MCA adding two areas</p> <p>1O verification</p> <p>OR/OF 1A multiply 4 1A multiply 12 1SF substitution 1SF substitution 1CA area of triangle 1CA simplification</p> <p>1MCA adding two areas</p> <p>1O verification</p>	<p>(8)</p>
3.3.3	<p>Area in m^2 /Opp. in m^2 $= 52\,704 \div 100^2$ $= 5,2704 \text{ m}^2 \quad \checkmark\text{C}$</p> <p>Number of litres needed /Getal liter nodig $= 5,2704 \times 12,46 \quad \checkmark\text{MCA}$ $= 65,669\dots \quad \checkmark\text{CA}$ ≈ 66</p>	<p>1C conversion</p> <p>1MCA multiplying</p> <p>1CA simplification NPR</p>	<p>M L3 D</p> <p>(3)</p>
		<p>[33]</p>	

QUESTION/VRAAG 4 [30 MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
4.1.1*	\checkmark RT $4 : 24 \checkmark$ A $= 1 : 6 \checkmark$ CA	1RT correct values 1A correct order 1CA simplification AO (3)	MP L2 E
4.1.2	Length of runway / <i>Lengte van die loopplank</i> $\frac{54}{3,28084} \checkmark$ RT \checkmark MA $= 16,459199... \text{ m} \checkmark$ CA	1RT correct runway 1MA dividing by 3,28084 1CA length of runway NPR (3)	M L2 M
4.1.3 (a)	To eliminate the obstruction that could be caused by front row spectators $\checkmark\checkmark$ O <i>Dit elimineer obstruksie wat deur eerste ry toeskouers veroorsaak word</i> OR/OF $\checkmark\checkmark$ O To have a clear view of the models on the floor runway. <i>Om 'n duidelike siglyn van die modelle op die vloerloopplank te hê.</i>	2O reason (2)	MP L4 E
4.1.3 (b)	$\checkmark\checkmark$ O The other runway is higher than the floor runway <i>Die ander loopplank is hoër as die vloer-loopplank</i> OR/OF $\checkmark\checkmark$ O Passage where people can pass through/ <i>Deurgang vir mense</i> OR/OF $\checkmark\checkmark$ O A step between the two runways / <i>n Trap tussen die twee loopplanke</i> OR/OF $\checkmark\checkmark$ O To avoid collisions/ <i>Om botsings te verhoed</i>	2O reason (2)	MP L4 E
4.1.4 (a)	$\text{Radius} = \frac{1,8288\text{m}}{2} = 0,9144 \text{ m} \checkmark$ A Area of a circle / <i>Opp. van die sirkel</i> $= 3,142 \times (0,9144 \text{ m})^2 \checkmark$ SF $= 2,627112... \text{ m}^2 \checkmark$ CA	1A calculating radius 1SF substitution 1CA area of circle NPR (3)	M L2 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
4.1.4 (b)	$\text{Circumference / Omtrek} = 3,142 \times 1,8288 \text{ m} \quad \checkmark\text{SF}$ $= 5,7460896 \text{ m} \quad \checkmark\text{CA}$ $\text{Length allocated/ Lengte toegeken} = \frac{5,7460896 \text{ m}}{10} \quad \checkmark\text{MCA}$ $= 0,5746... \text{ m} \quad \checkmark\text{CA}$	1SF substitution 1CA simplification 1MCA dividing by 10 1CA length per person NPR	M L3 M
		(4)	
4.2.1	XS $\checkmark\checkmark\text{RT}$	2RT correct size	M L1 E
		(2)	
4.2.2	80 kg $\checkmark\checkmark\text{RT}$	2RT correct weight	M L2 E
		(2)	
4.2.3	$\text{BMI / LMI} = \frac{70 \text{ kg}}{(1,50 \text{ m})^2} \quad \checkmark\text{MA}$ $\quad \checkmark\text{MA}$ $= 31,11... \text{ kg/m}^2 \quad \checkmark\text{A}$	1MA numerator 1MA denominator 1A correct BMI NPR	M L2 M
		(3)	
4.2.4	100% $\checkmark\checkmark\text{A}$	2A correct probability	P L2 E
		(2)	
4.2.5*	$P = \frac{5}{6} \quad \checkmark\text{A}$ $\quad \checkmark\text{A}$ $= 0,833 \quad \checkmark\text{CA}$ VALID/ <i>GELDIG</i> $\checkmark\text{O}$	1A Numerator 1A Denominator 1CA simplification 1O opinion	P L4 M
		(4)	
		[30]	

QUESTION/VRAAG 5 [27 MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
5.1	Surface area of a cube / <i>Buite opp. van kubus</i> $= 6 \times (4,5 \text{ cm})^2 \quad \checkmark\text{SF}$ $= 121,5 \text{ cm}^2 \quad \checkmark\text{A}$	1SF substitution 1A simplification 1A unit AO (3)	M L2 E
5.2.1	$\text{Total mass / Totale massa} = 60 \times 2 \text{ ton} = 120 \text{ ton} \quad \checkmark\text{MA} \quad \checkmark\text{A}$ $= \frac{120}{0,001} \text{ kg} \quad \checkmark\text{C}$ $= 120\,000 \text{ kg} \quad \checkmark\text{CA}$ <p>OR/OF 1 ton = 1 000 kg $\checkmark\text{C}$</p> $1\,000 \text{ kg} \times 2 = 2\,000 \text{ kg} \quad \checkmark\text{MA}$ $1\,000 \text{ kg} \times 2 = 2\,000 \text{ kg} \quad \checkmark\text{A}$ Mass of 60 blocks/ <i>Massa van 60 blokke</i> $= 2\,000 \times 60$ $= 120\,000 \text{ kg} \quad \checkmark\text{CA}$	1MA multiplying by 2 1A simplification 1C conversion 1CA simplification OR/OF 1C conversion 1MA multiplying by 2 1A simplification 1CA simplification (4)	M L1 E
5.2.2	$38\,500 \text{ cm}^3 = \text{volume of ice/ ys} \times 0,92 \quad \checkmark\text{SF}$ $\frac{38500}{0,92} \text{ cm}^3 = \text{volume of ice/ ys} \quad \checkmark\text{MA}$ $41\,847,826\dots \text{ cm}^3 = \text{volume of ice / ys} \quad \checkmark\text{A}$	1SF substitution 1MA changing the subject of the formula 1A volume of ice NPR (3)	M L2 M
5.3.1*	Difference / <i>Verskil</i> $= 3\,350 - 2\,900 \quad \checkmark\text{RT} \quad \checkmark\text{RT}$ $= 450 \text{ nautical miles /seemyl} \quad \checkmark\text{CA}$	1RT 1 st value 1RT 2 nd value 1CA with subtraction NPU AO (3)	MP L2 E

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
5.3.2	<p>Distance in miles / <i>Afstand in myl</i></p> <p>✓ RT $= 3\,950 \times 1,151$ ✓ C $= 4\,546,45$ miles.</p> <p>Distance in km / <i>Afstand in km</i></p> <p>$= \frac{4\,546,45}{0,6215}$ ✓ C $= 7\,315,285599$ km ✓ CA</p> <p>OR/OF Distance /<i>afstand</i> in km:</p> <p>✓ RT ✓ C $3\,950 \times \frac{1,151}{0,6215}$ ✓ C $= 7\,315,285599$ km. ✓ CA</p>	<p>1RT value of 3 950 1C multiply by 1,151</p> <p>1C dividing by 0,6215</p> <p>1CA simplification</p> <p>OR/OF</p> <p>1RT value of 3 950 1C multiply by 1,151 1C dividing by 0,6215</p> <p>1CA simplification NPR</p> <p>(4)</p>	M L2 E
5.3.3 (a)	<p>10 days/<i>dae</i> 4 hours/<i>uur</i> = 244 hours/<i>uur</i> ✓ C</p> <p>$2\,607 = \text{speed}/\textit{spoed} \times 10 \text{ days}/\textit{dae} \ 4 \text{ hours}/\textit{uur}$ ✓ SF $2\,607 = \text{speed}/\textit{spoed} \times 244 \text{ hours}/\textit{uur}$</p> <p>$\frac{2\,607}{244} = \text{speed}/\textit{spoed}$ ✓ MA ✓ R Ave speed/<i>spoed</i> $\approx 10,68$ nautical miles/hour /<i>seemyl/uur</i></p> <p>OR/OF</p> <p>10 days/<i>dae</i> 4 hours/<i>uur</i> = 244 hours/<i>uur</i> ✓ C</p> <p>Hrs for the second part/<i>Ure vir die tweede deel</i></p> <p>$= \frac{3\,350 \times 244}{2\,607}$ $= 313,54$</p> <p>Ave Speed/<i>Gem.Spoed</i> = $\frac{\textit{distance}}{\textit{time}}$ ✓ MA</p> <p>$= \frac{3\,350 + 2\,607}{313,54 + 244}$ ✓ SF $= \frac{5\,957}{557,54}$ $= 10,68$ ✓ R nautical miles/hour /<i>seemyl/uur</i></p>	<p>1C conversion</p> <p>1SF substitution</p> <p>1MA changing subject of formula 1R simplification correctly rounded</p> <p>OR/OF</p> <p>1C conversion</p> <p>1MA changing subject of formula</p> <p>1SF substitution</p> <p>1R simplification correctly rounded</p> <p>(4)</p>	M L3 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
5.3.3* (b)	<p>Time/ tyd = $\frac{3\,350 \text{ miles}}{10,68 \text{ nautical miles /hour}}$ ✓ MA = 313,67 hours ✓ CA = $\frac{313,67 \text{ hours}}{24 \text{ hours}}$ ✓ C = 13 days /dae and 1,67 hours/ uur ✓ CA</p> <p>Arrival date and time 7 October at 17:40 ✓ CA Aankoms datum en tyd 7 Oktober om 17:40</p> <p>OR/OF Ship travels 2 607 in 244 hours 3 350 in n hours</p> <p>$n = \frac{3\,350 \times 244}{2\,607}$ ✓ MA ✓ CA = 313,5404679708 ÷ 24 ✓ C = 13,064186 ✓ CA ✓ CA = 13 days/dae and 1,54 hours / uur</p> <p>= 13 days 1 hour 32 min</p> <p>Arrive 7 Oct at 17:32 ✓ CA Aankoms 7 Okt. Om 17:32</p>	<p>CA from 5.3.3 (a) 1MA dividing by speed 1CA hours 1C conversion 1CA number of days 1CA hours 1CA correct date and time</p> <p>OR/OF 1MA using the ratio 1CA hours 1C conversion 1CA number of days 1CA hours 1CA correct date and time (6)</p>	<p>M L3 D</p>
		[27]	
		TOTAL/ TOTAAL: 150	