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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>Penalising bv. vir geen eenhede/verkeerde afronding, ens.</i>
R	Rounding off/ <i>Afronding</i>
NPR	No penalty for rounding/ <i>Geen penalising 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 gepeenaliseer.</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*	$\begin{aligned} &\quad \quad \quad \checkmark \text{ RT} \quad \quad \quad \checkmark \text{ RT} \\ \text{Tot. dist.} &= 980 \text{ m} + 435 \text{ m} + 870 \text{ m} + 1\,100 \text{ m} \\ &= 3\,385 \text{ m} \quad \checkmark \text{ CA} \end{aligned}$	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. ✓✓ A /Allensleutel	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 ✓✓ 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 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>North table is narrow ✓✓ O or small or limited space./<i>Noord-tafel is baie nou of te min spasie.</i></p> <p>OR/OF ✓✓ 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 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 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) 1MCA correct order of the ratio 1C conversion</p> <p>1CA simplified unit ratio</p> <p>OR/OF 1MCA correct order of the ratio 1C conversion 1CA simplified unit ratio</p>	MP L2 M

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

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
2.3.2	<p>✓✓ A 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>OR/OF</p> <p>✓✓ A 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>OR/OF</p> <p>✓✓ A 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>(2)</p>	MP L1 M
2.3.3	<p>✓RT ✓RT Tram/Kloof Street and Albert Street. <i>Tram/Kloofstraat en Albertstraat</i></p>	<p>1RT Tram or Kloof 1RT Albert</p> <p>(2)</p>	MP L2 M
2.3.4	<p>0 ✓✓ A OR/OF Impossible/ none / no chance <i>Onmoontlik/ nul / geen kans</i></p>	<p>2A correct probability</p> <p>(2)</p>	P L2 E
2.3.5	<p>Different <u>roads</u>/routes that lead <u>to the hotel</u>. ✓✓ O <i>Verskillende <u>roetes</u>/paaie wat <u>na die hotel</u> toe gaan.</i></p> <p>OR/OF 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>OR/OF ✓✓ O 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>(2)</p>	MP L4 M

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
2.3.6	<p>Arrival time / <i>Aankomstyd</i></p> <p style="text-align: right;">✓ MA ✓ A</p> $= 04:55 + 10 \text{ min} + 20 \text{ min} + 5 \text{ min}$ $= 05:30 \quad \checkmark \text{ CA}$ <p style="text-align: right;">✓ 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></p> $= 10 \text{ min} + 20 \text{ min} + 5 \text{ min} = 35 \text{ min} \quad \checkmark \text{ A}$ <p>Arrival time/ <i>Aankomstyd</i>. $04:55 + 00:35 \quad \checkmark \text{ MA}$</p> $= 05:30 \quad \checkmark \text{ CA}$ <p>The receptionist will be on time for work. ✓ 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></p> $= 05:30 - 04:55 = 35 \text{ min} \quad \checkmark \text{ MA}$ <p>Duration of time from home to work / <i>Duur van tyd van huis tot werk</i></p> <p style="text-align: right;">✓ MA ✓ A</p> $10 \text{ min} + 20 \text{ min} + 5 \text{ min} = 35 \text{ min}$ <p>Yes she will reach the hotel on time./ <i>Sy sal betyds wees</i> ✓ O</p> <p>OR/OF</p> $4:55 + 0:20 = 05:15 \quad \checkmark \text{ A}$ $05:15 + 0:10 = 05:25 \quad \checkmark \text{ MA}$ $05:25 + 0:05 = 05:30 \quad \checkmark \text{ CA}$ <p>She will arrive on time/ <i>Sy sal betyds wees</i> ✓ O</p> <p>OR/OF</p> <p style="text-align: right;">✓ A ✓ MA</p> $05:30 - 5 \text{ mins} - 20 \text{ mins} - 10 \text{ mins}$ $= 04:55 \quad \checkmark \text{ CA}$ <p>The receptionist will be on time for work./ <i>Sy sal betyds wees</i> ✓ 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>	MP L4 M
		[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> $= 2,7 \times 1\,000\,000$ ✓MA $= 2\,700\,000$ ✓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> $= 2,375\text{ kg} + 1,2\text{ kg} + \left(\frac{750}{1\,000}\right)\text{kg}$ ✓C ✓MA $= 4,325\text{ kg}$ ✓CA	1C conversion 1MA adding all the mass 1CA total mass in kg (3)	M L2 M
3.2.1	Volume = $30\text{ cm} \times 30\text{ cm} \times 60\text{ cm}$ ✓SF $= 54\,000\text{ cm}^3$ ✓CA $\text{Total /Totale volume} = \frac{54\,000}{1\,000\,000}\text{ m}^3 \times 12$ ✓C ✓MA $= 0,648\text{ m}^3$ ✓CA OR/OF Volume = $0,3\text{ m} \times 0,3\text{ m} \times 0,6\text{ m}$ ✓C ✓SF ✓MA $= 0,054\text{ m}^3$ ✓CA Total /Totale volume = $0,054\text{ m}^3 \times 12$ $= 0,648\text{ m}^3$ ✓CA OR/OF Total volume in $\text{m}^3 = 12(0,3 \times 0,3 \times 0,6)$ ✓MA ✓C ✓SF ✓CA $= 0,648$ ✓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. ✓✓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 <u>spasie</u> op in die <u>gat</u>.</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 $0,75 \text{ m}^3$ For 1 m^3 the cement / Vir 1 m^3 is die sement $= \frac{5,5}{0,75} \checkmark \text{MA} = 7,33\ldots \text{ bags /sakke } \checkmark \text{A}$</p> <p>But 1 bag cement mix with 2 wheelbarrows of sand Maar 1 sak sement meng met 2 kroiwaens sand</p> <p>Number of wheelbarrows of sand Getal kroiwaens sand $= 7,333\ldots \times 2 = 14,666\ldots \checkmark \text{MA} \checkmark \text{CA}$</p> <p>Mass of the sand / Massa sand $= 102 \times 14,666\ldots \checkmark \text{MA}$ $= 1\,496 \text{ kg } \checkmark \text{CA}$</p> <p>OR/OF</p> <p>Sand needed for $0,75 \text{ m}^3$ concrete Sand nodig vir $0,75 \text{ m}^3$ beton $= 5,5 \times 2 \checkmark \text{MA}$ $= 11 \text{ wheel barrows /kroiwaens } \checkmark \text{A}$</p> <p>Mass of sand need for $0,75 \text{ m}^3$ of concrete Massa sand nodig vir $0,75 \text{ m}^3$ beton $= 11 \times 102 \text{ kg } \checkmark \text{MCA}$ $= 1\,122 \text{ kg } \checkmark \text{CA}$</p> <p>Mass of sand for 1 m^3 the concrete Massa van sand vir 1 m^3 beton $= 1\,122 \text{ kg} \times \frac{1}{0,75} \checkmark \text{MA}$ $= 1\,496 \text{ kg } \checkmark \text{CA}$</p> <p>OR/OF</p> <p>For /Vir $0,75 \text{ m}^3$: $5,5 \times 50 = 275 \text{ kg cement/ement}$ $\checkmark \text{MA} \checkmark \text{CA}$ $1 \text{ m}^3 : 275 \div 0,75 = 366,66\ldots \text{ kg cement/ement}$</p> <p>Mixing ratio / Meng verhouding 1 bag/sak : 2 wheelbarrows sand</p> <p>Cement/ sement $50 \text{ kg} : 204 \text{ kg sand}$ $\checkmark \text{A}$ $366,66 : n$</p> <p>$n = \frac{366,66}{50} \times 204 \checkmark \text{MCA} \checkmark \text{MA}$ $= 1\,496 \text{ kg } \checkmark \text{CA}$</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>	M L3 D

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p>OR/OF</p> <p style="text-align: right;">✓MCA</p> $5,5 \times 102 \text{ kg} = 561 \text{ kg} \quad \checkmark\text{MA}$ $\text{So } 561 \text{ kg} \times 2 = 1\,122 \text{ kg.} \quad \checkmark\text{A}$ $0,75 \text{ m}^3 \text{ is } 1\,122 \text{ kg} \quad \checkmark\text{CA}$ $\text{So: } 1 \text{ m}^3 \text{ will be } = \frac{1\,122}{0,75} \quad \checkmark\text{MA}$ $= 1\,496 \text{ kg} \quad \checkmark\text{CA}$ <p>OR/OF</p> $5,5 \text{ bags cement/sakke sement is } 0,75 \text{ m}^3 \quad \checkmark\text{MA}$ $0,75 \text{ m}^3 \div 5,5 = 0,1363636... \text{ m}^3 \text{ per bag /sak} \quad \checkmark\text{A}$ $1 \text{ m}^3 \div 0,13636... = 7,333... \text{ bags/sakke}$ $\text{Wheelbarrows/ Kruiswaens} = 7,333... \times 2 \quad \checkmark\text{MA}$ $= 14,666... \quad \checkmark\text{CA}$ $\text{Mass / massa} = 14,666... \times 102 \text{ kg} \quad \checkmark\text{MA}$ $= 1\,496 \text{ kg} \quad \checkmark\text{CA}$ <p>OR/OF</p> $\text{Mass/massa in kg} = \frac{102}{0,75} \times (5,5 \times 2) \quad \checkmark\text{MA} \quad \checkmark\text{MA}$ $= 136 \times 11 \quad \checkmark\text{A} \quad \checkmark\text{CA}$ $= 1\,496 \quad \checkmark\text{CA}$	<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> $\checkmark\text{MA}$</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>	M L2 M

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 \checkmark SF Area of rectangle $= 125 \text{ mm} \times (1,6 \times 1\,000)$ Opp. Van reghoek $= 125 \text{ mm} \times 1\,600 \text{ mm}$ $= 200\,000 \text{ mm}^2$ In $\text{cm}^2 = 200\,000 \div 100 = 2\,000 \text{ cm}^2 \checkmark$ C Total surface area $= 2\,000 \text{ cm}^2 \times 12 \times 2 \checkmark$ MA 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>(4)</p>	
3.3.2	<p>Area of the rectangular part / Opp. van reghoekige deel \checkmark SF $= (15,24 \text{ cm} \times 2,5 \text{ cm}) \times 4$ $= 38,1 \text{ cm}^2 \times 4 = 152,4 \text{ cm}^2 \checkmark$ CA</p> <p>Area of the 4 top triangles/ Opp. van 4 driehoeke $= (\frac{1}{2} \times \text{base} \times \text{height}) \times 4 \checkmark$ 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 / Totale opp. van 1 pilaardop $= 152,4 \text{ cm}^2 + 239,5728 \text{ cm}^2 = 391,97 \text{ cm}^2$</p> <p>Total area for 12 posts/ Totale opp. vir die 12 pilare $= 391,9728 \text{ cm}^2 \times 12 \checkmark$ A $\approx 52\,704 \text{ cm}^2 \checkmark$ MCA</p> <p>VALID/ GELDIG \checkmark O</p>	<p>CA post's area from 3.3.1 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/Oplossing	Explanation/Verduideliking	T/L
	<p>OR/OF</p> <p>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> $= 79,9932 \text{ cm}^2 \times 4 = \checkmark \text{A}$ $391,9728 \text{ cm}^2$</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> $= 1703,6736 \text{ cm}^2 + 48000 \text{ cm}^2$ $= 52\,703,6736 \text{ cm}^2$ $\approx 52\,704 \text{ cm}^2 \checkmark \text{MCA}$ VALID/ GELDIG $\checkmark \text{O}$</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> $\checkmark \text{SF}$ $= \frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm} \times 4 \times 12 \checkmark \text{A}$ $= 2874,8736 \text{ cm}^2 \checkmark \text{CA}$</p> <p>Total area / <i>Totale opp.</i> $= 1828,8 \text{ cm}^2 + 2\,874 \text{ cm}^2 + 48\,000 \text{ cm}^2$ $= 52\,703,67 \text{ cm}^2 \approx 52\,704 \text{ cm}^2 \checkmark \text{MCA}$ VALID/ GELDIG $\checkmark \text{O}$ 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 1O verification</p>	

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	<p>Area cap triangle /Opp. pilaardop driehoek $= \frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm}^2$ ✓SF $= 59,8932 \text{ cm}^2$ ✓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. $= 15,24 \text{ cm} \times 2,5 \text{ cm}$ ✓SF $= 38,1 \text{ cm}^2$ ✓CA So: $38,1 \text{ cm}^2 \times 4 = 152,4 \text{ cm}^2$ ✓A $152,4 \text{ cm}^2 \times 12 = 1\,828,8 \text{ cm}^2$ ✓A</p> <p>Total area $= 1828,8 \text{ cm}^2 + 2\,874 \text{ cm}^2 + 48\,000 \text{ cm}^2$ Totale opp. $= 5\,2703,67 \text{ cm}^2$ $\approx 5\,2704 \text{ cm}^2$ ✓MCA</p> <p>VALID/ GELDIG ✓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 $= 48\,000 + 4\,704$ $= 52\,704$ ✓MCA</p> <p>VALID/ GELDIG ✓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 $= 52\,704 \div 100^2$ $= 5,2704 \text{ m}^2$ ✓C</p> <p>Number of litres needed /Getal liter nodig $= 5,2704 \times 12,46$ ✓MCA $= 65,669\dots$ ✓CA ≈ 66</p>	<p>1C conversion</p> <p>1MCA multiplying</p> <p>1CA simplification NPR</p> <p>(3)</p>	M L3 D
		[33]	

QUESTION/VRAAG 4 [30 MARKS/PUNTE]			
Q/V	Solution/Oplossing	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 /Lengte van die loopplank $\frac{54}{3,28084} \checkmark$ 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)	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/Oplossing	Explanation/Verduideliking	T/L
4.1.4 (b)	<p>Circumference / <i>Omtrek</i> = $3,142 \times 1,8288 \text{ m}$ ✓SF = $5,7460896 \text{ m}$ ✓CA</p> <p>Length allocated/ <i>Lengte toegeken</i> = $\frac{5,7460896 \text{ m}}{10}$ ✓MCA = $0,5746... \text{ m}$ ✓CA</p>	<p>1SF substitution 1CA simplification</p> <p>1MCA dividing by 10 1CA length per person NPR</p> <p>(4)</p>	M L3 M
4.2.1	XS ✓✓RT	2RT correct size (2)	M L1 E
4.2.2	80 kg ✓✓RT	2RT correct weight (2)	M L2 E
4.2.3	<p>BMI / <i>LMI</i> = $\frac{70 \text{ kg}}{(1,50 \text{ m})^2}$ ✓MA ✓MA</p> <p>= $31,11... \text{ kg/m}^2$ ✓A</p>	<p>1MA numerator 1MA denominator</p> <p>1A correct BMI NPR</p> <p>(3)</p>	M L2 M
4.2.4	100% ✓✓A	2A correct probability (2)	P L2 E
4.2.5*	<p>$P = \frac{5}{6}$ ✓A ✓A</p> <p>= $0,833$ ✓CA</p> <p>VALID/ <i>GELDIG</i> ✓O</p>	<p>1A Numerator 1A Denominator</p> <p>1CA simplification</p> <p>1O opinion (4)</p>	P L4 M
		[30]	

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

Q/V	Solution/Oplossing	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 $3\,950 \times \frac{1,151}{0,6215}$ ✓ 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 1CA simplification</p> <p>OR/OF</p> <p>1RT value of 3 950 1C multiply by 1,151 1C dividing by 0,6215 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 = speed/<i>spoed</i> \times 10 days/<i>dae</i> 4 hours/<i>uur</i> ✓ SF 2 607 = speed/ <i>spoed</i> \times 244 hours/<i>uur</i> $\frac{2\,607}{244} = \text{speed}/\text{spoed}$ ✓ 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> = $\frac{\text{distance}}{\text{time}}$ ✓ 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 1SF substitution 1MA changing subject of formula 1R simplification correctly rounded</p> <p>OR/OF</p> <p>1C conversion</p> <p>1MA changing subject of formula 1SF substitution 1R simplification correctly rounded</p> <p>(4)</p>	M L3 M

Q/V	Solution/Oplossing	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 ✓ CA and 1,67 hours ✓ CA / uur</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 $n = \frac{3\,350 \times 244}{2\,607}$ ✓ MA = 313,5404679708 ÷ 24 ✓ C = 13,064186 = 13 days ✓ CA and 1,54 hours ✓ CA / uur = 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	