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

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*.

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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*	✓ RT ✓ RT Tot. dist. = 980 m + 435 m +870 m + 1 100 m = 3 385 m ✓ CA	1RT 1st 2 correct values 1RT 2nd 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*	✓✓ A Allen key. /*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	A layout plan describes the physical arrangement of all structures that consume space within a facility. ✓✓ A *'n Uitlegplan toon die rangskikking van al die strukture, stoele ens. wat die ruimte van die lokaal beslaan.* **OR/*OF*** A layout plan is a top view that shows the arrangement of features / structures / location or position of items. ✓✓ A *'n Uitlegplan is die bo-aansig wat die rangskikking van die voorwerpe/ strukture / ligging of posisie van items aantoon.*	2A correct definition (2)	MP L1 E
2.1.2	20 ✓✓ A	2A number of seats (2)	MP L1 E
2.1.3	C ✓✓ A **OR/*OF*** The screen is opposite the door leading into the room/ *Die skerm is oorkant die ingangsdeur.*	2A correct option (2)	MP L1 M
2.1.4	North table is narrow or small or limited space./*Noord-tafel is baie nou of te min spasie.* ✓✓ O **OR/*OF*** Plants will block or obscure the view of participants seated there/*Plante sal die uitsig van deelnemers wat hier sit belemmer.* ✓✓ O	2O acceptable reason (2)	MP L4 E
2.1.5* (a)	12,7 cm or 127 mm ✓ ✓A	2A measured value Accept: 12,4 – 12,8 cm (2)	MP L2 E
2.1.5* (b)	GP, MP, NC: 12,7 cm : 12 m ✓ MCA 12,7 : 1 200 ✓ C 1: 94,49 ✓ CA **OR/*OF*** FS, NW, WC 12,4 cm : 12 m ✓ MCA 12,4 : 1 200 ✓ C 1: 96,77 ✓ CA	**CA from 2.1.5(a)** 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	MP L2 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF* EC, KZN, LP 12,5 cm :12 m ✓ MCA 0,125 : 12 ✓ C 1 : 96 ✓ CA **OR/*OF*** 125 mm : 12 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/*halwe tafel lengte* = 145 cm ✓A Pack length wise along table's top length/ *lengte teen lengte:* $\frac{145\,cm}{36{,}4cm} = 3{,}98$ ✓ MA ≈ 3 packs./*pakke*. ✓ R And the width against the table width / *breedte teen breedte* ✓ A $\frac{49\,cm}{24{,}2\,cm} = 2{,}02$ = 2 packs./*pakke* Number that can be packed / *getal wat gepak kan word* ✓ MA = 3 × 2 = 6 packs/*pakke* ✓ CA But/*Maar* $36{,}4 \times 3 = 109{,}2cm$ And/*en* $145cm - 109{,}2cm = 35{,}8cm$ Pack width wise along table's top length / *Breedte teen lengte* $\frac{35{,}8cm}{24{,}2} = 1{,}479338843 \approx 1\ pack$ ✓ A Length against the width / *lengte teen breedte* $\frac{49cm}{36{,}4} = 1{,}346153846 \approx 1\ pack$ Total number of packs /*Totale getal pakke* = 6 + 1 = 7 ✓CA ∴The maximum is 7 packs / *Maksimum is 7 pakke*	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*	✓✓ A South East **OR** SE./ *Suidoos OF SO*	2A direction (2)	MP L2 M

Q/*V*	Solution/*Oplossing*	Explanation/Verduideliking	T/L
2.3.2	✓✓ A There is no relationship (or ratio) between distances on a map and the corresponding distance on the ground. *Daar is geen verwantskap tussen die afstande op die kaart en die ooreenstemmende afstand op die grond nie.* **OR/*OF*** ✓✓ 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. *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.* **OR/*OF*** ✓✓ A The map is a free hand drawing/ rough sketch since scale was not used when it was drawn *Die kaart is 'n vryhand tekening / rofwerkskets aangesien geen skaal gebruik was om dit te teken nie.*	2A correct statement (2)	MP L1 M
2.3.3	✓RT ✓RT Tram/Kloof Street and Albert Street. *Tram/Kloofstraat en Albertstraat*	1RT Tram or Kloof 1RT Albert (2)	MP L2 M
2.3.4	0 ✓ ✓A **OR/*OF*** Impossible/ none / no chance *Onmoontlik/ nul / geen kans*	2A correct probability (2)	P L2 E
2.3.5	Different <u>roads</u>/routes that lead <u>to the hotel</u>. ✓ ✓O *Verskillende <u>roetes</u>/paaie wat <u>na die hotel</u> toe gaan.* **OR/*OF*** The <u>streets</u> are possible entry points for <u>conference attendees.</u> ✓ ✓O *Die <u>strate</u> is die moontlike ingange punte vir die <u>konferensie gangers</u>.* **OR/*OF*** ✓ ✓O For getting <u>direction</u> easily to the <u>destination</u>. *Dit vergemaklik <u>rigting</u> aanwysings na die <u>bestemming</u>.*	2O reason (2)	MP L4 M

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

QUESTION/*VRAAG* 3 [33 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
3.1.1	Number of eggs/ *Getal eiers* = 2,7 × 1 000 000 ✓MA = 2 700 000 ✓A **OR/*OF*** Two million seven hundred thousand/ *Twee miljoen sewe honderd duisend*	1MA multiply by 1 000 000 1A correct answer AO (2)	M L1 E
3.1.2	Total mass/ *Totale massa* =2,375 kg + 1,2 kg + $(\frac{750}{1\,000})$kg ✓C ✓MA = 4,325 kg ✓CA	1C conversion 1MA adding all the mass 1CA total mass in kg (3)	M L2 M
3.2.1	Volume = 30 cm × 30 cm × 60 cm ✓SF = 54 000 cm^3 ✓CA Total /*Totale* volume = $\frac{54\,000}{1\,000\,000}$ ✓C m^3 × 12 ✓MA = 0,648 m^3 ✓CA **OR/*OF*** Volume = 0,3 m × 0,3 m × 0,6 m ✓C ✓SF ✓MA = 0,054 m^3 ✓CA Total /*Totale* volume = 0,054 m^3 × 12 = 0,648 m^3 ✓CA **OR/*OF*** Total volume in m^3=12(0,3 × 0,3 × 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 *Die pilare se volume sal van die volume beton opneem.* **OR/*OF*** The posts will take up <u>space</u> in the <u>hole</u>. /*Die pilare neem <u>spasie</u> op in die <u>gat</u>.*	2O opinion (2)	M L4 M

Q/*V*	Solution/*oplossing*	Explanation/*Verduideliking*	T/L
3.2.3*	5,5 bags of cement make/*sakke sement maak* 0,75 m^3 For 1 m^3 the cement / *Vir 1 m^3 is die sement* $= \frac{5,5}{0,75}$ ✓MA = 7,33.. bags /*sakke* ✓A But 1 bag cement mix with 2 wheelbarrows of sand *Maar 1 sak sement meng met 2 kruiwaens sand* Number of wheelbarrows of sand *Getal kruiwaens sand* = 7,333… × 2 ✓MA = 14,666.. ✓CA Mass of the sand / *Massa sand* = 102 × 14,6666… ✓MA = 1 496 kg ✓CA **OR/*OF*** Sand needed for 0,75 m^3 concrete *Sand nodig vir 0,75 m^3 beton* = 5,5 × 2 ✓MA = 11 wheel barrows /*kruiwaens* ✓A Mass of sand need for 0,75 m^3 of concrete *Massa sand nodig vir 0,75 m^3 beton* = 11 × 102 kg ✓MCA = 1 122 kg ✓CA Mass of sand for 1 m^3 the concrete *Massa van sand vir 1m^3 beton* = 1 122 kg × $\frac{1}{0,75}$ ✓MA = 1 496 kg ✓CA **OR/*OF*** For /*Vir* 0,75 m^3: 5,5 × 50 = 275 kg cement/*sement* ✓MA ✓CA 1 m^3 : 275 ÷ 0,75 = 366,666.. kg cement/*sement* Mixing ratio / Meng verhouding 1 bag/sak : 2 wheelbarrows sand Cement/ *sement* 50 kg : 204 kg ✓A sand 366,66 : *n* $n = \frac{366,66}{50} \times 204$ ✓MCA ✓MA = 1 496 kg ✓CA	1MA working with ratio 1A number of bags 1MA multiplying by 2 1CA number of wheelbarrows 1MA multiply with mass 1CA simplification **OR/*OF*** 1MA working with ratio 1A number of wheelbarrows 1MCA multiplying by mass 1CA simplification 1MA dividing by 0,75 1CA simplification **OR/*OF*** 1MA dividing by 0,75 1CA simplification 1A mass of wheelbarrows 1MCA multiplying by mass 1MA working with ratio 1CA simplification	M L3 D

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF*		
	✓MCA 5,5 × 102 kg = 561 kg ✓MA So 561 kg × 2 = 1 122 kg. ✓A 0,75 m^3 is 1 122 kg ✓CA So: 1 m^3 will be = $\frac{1\,122}{0,75}$ ✓MA = 1 496 kg ✓CA	1MCA multiplying by mass 1MA working with ratio 1A number of wheelbarrows 1CA simplification 1MA dividing by 0,75 1CA simplification	
	OR/*OF*	**OR/*OF***	
	5,5 bags cement/*sakke sement* is 0,75 m^3 ✓MA 0.75 m^3 ÷ 5,5 = 0,1363636… m^3 per bag /*sak* ✓A 1 m^3 ÷ 0,13636… = 7,333… bags/*sakke* Wheelbarrows/ *Kruiwaens* = 7,333.. × 2 ✓MA = 14,666… ✓CA Mass / *massa* = 14,666… × 102 kg ✓MA = 1 496 kg ✓CA	1MA working with ratio 1A number of bags 1MA multiplying by 2 1CA number of wheelbarrows 1MA multiply with mass 1CA simplification	
	OR/*OF*	**OR/*OF***	
	✓MA Mass/*massa* in kg = $\frac{102}{0,75}$×(5,5 × 2) ✓MA ✓MA = 136 × 11 ✓A ✓CA = 1 496 ✓CA	3MA marks ratio, × 2, × mass 1A bags 2CA simplification & final answer (6)	
3.3.1	Area of rectangle/ *Opp. van reghoek* = 1,6 m × 125 mm ✓SF = 160 cm × 12,5 cm ✓C = 2 000 cm^2 Total surface area/ *Totale oppervlakte* ✓MA = 2 000 cm^2 × 2 sides/*kante* × 12 posts/*pilare* = 48 000 cm^2 ✓CA	1SF substitution 1C converting both 1MA multiply by 2 and 12 1CA simplification	M L2 M
	OR/*OF*	**OR/*OF***	
	Area of one face / *Opp. van een aansig* = ($\frac{125}{10}$) cm ✓C× (1,6 × 100) cm ✓SF = 2 000 cm^2 Area of all the posts / *Opp. van al die pilare* = 2 000 cm^2 × (2 × 12) ✓MA = 48 000 cm^2 ✓CA	1C converting both 1SF substitution 1MA multiply by 2 and 12 1CA simplification	

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

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	OR/*OF*	**OR/*OF***	
	Area of the triangle/ *Opp. van driehoek* = ($\frac{1}{2}$ ×base × height) =($\frac{1}{2}$ × 15,24 cm × 7,86 cm) ✓SF = 59,8932 cm^2 ✓CA	1SF substitution 1CA area of triangle	
	Area of the rectangle /*Opp. van reghoekige deel* = (15,24 cm × 2,5 cm) ✓SF = 38,1 cm^2 ✓CA	1SF substitution 1CA simplification	
	Area of one face / *Opp. van een aansig* = 59,8932 cm^2 + 38,1 cm^2 = 79,9932 cm^2		
	Total Area/*Totale opp.* = 79,9932 cm^2 × 4 = ✓A 391,9728 cm^2	1A multiply 4	
	Area for 12 caps/*Opp. van 12 pilaardoppe* = 391,9728 cm^2 × 12 = 4703,6736 cm^2 ✓A	1A multiply 12	
	Total area to be painted/*Totale opp. om te verf* = 1703,6736 cm^2 + 48000 cm^2 = 52 703,6736 cm^2 ≈ 52 704 cm^2 ✓MCA VALID/ *GELDIG* ✓O	1MCA adding two areas 1O verification	
	OR/*OF*	**OR/*OF***	
	Area of posts / *Pilare se opp.* = 48 000 cm^2		
	Area of all caps (rectangular part)/ *Opp. pilaardop (reghoekige deel)* = (15,24 cm × 2,5cm) × 4 × 12 ✓SF = 1828,8 cm^2 ✓CA	1SF substitution 1CA simplification	
	Area of all caps (triangular part)/ *Opp. pilaardop (driehoekige deel)* ✓SF ✓A = ½ × 15,24 cm ×7,86 cm × 4 ×12 ✓A = 2874,8736 cm^2 ✓CA	1SF substitution 1A multiply 4 1A multiply 12 1CA area of triangle	
	Total area /*Totale opp.* = 1828,8 cm^2 + 2 874 cm^2 + 48 000 cm^2 = 5 2703,67 cm^2 ≈ 5 2704 cm^2 ✓MCA	1MCA adding two areas	
	VALID/ *GELDIG* ✓O **OR/*OF***	1O verification	

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
	Area cap triangle /*Opp. pilaardop driehoek* = ½ × 15,24 cm × 7,86 cm^2 ✓SF = 59,8932 cm^2 ✓CA So: 59,8932 × 4 = 239,5728 cm^2 239,5729 cm^2 × 12 = 2 874,8736 cm^2 Area rectangle/ *Reghoekige opp.* = 15,24 cm × 2,5 cm ✓SF = 38,1 cm^2 ✓CA So: 38,1 cm^2 × 4 = 152,4 cm^2 ✓A 152,4 cm^2 × 12 = 1 828,8 cm^2 ✓A Total area = 1828,8 cm^2 + 2 874 cm^2 + 48 000 cm^2 *Totale opp.* = 5 2703,67 cm^2 ≈ 5 2704 cm^2 ✓MCA VALID/ *GELDIG* ✓O **OR/*OF*** Total area to be painted / *Opp. om te verf* in cm^2 ✓A ✓A ✓SF ✓SF = (12 × 4 × 0,5 × 15,24 × 7,86) + (12 × 4 × 15,24 × 2,5) ✓CA ✓CA = 2 874,8736 + 1 828,8 = 4 703,6736 = 4 704 Posts + Caps = 48 000 + 4 704 = 52 704 ✓MCA VALID/ *GELDIG* ✓O	1SF substitution 1CA area of triangle 1SF substitution 1CA simplification 1A multiply 4 1A multiply 12 1MCA adding two areas 1O verification **OR/*OF*** 1A multiply 4 1A multiply 12 1SF substitution 1SF substitution 1CA area of triangle 1CA simplification 1MCA adding two areas 1O verification (8)	
3.3.3	Area in m^2 /*Opp. in m^2* = 52 704 ÷ 100^2 = 5,2704 m^2 ✓C Number of litres needed /*Getal liter nodig* = 5,2704 × 12,46 ✓MCA = 65,669… ✓CA ≈ 66	 1C conversion 1MCA multiplying 1CA simplification NPR (3)	M L3 D
		[33]	

QUESTION/*VRAAG* 4 [30 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
4.1.1*	✓RT 4 : 24 ✓A = 1 : 6 ✓CA	1RT correct values 1A correct order 1CA simplification AO (3)	MP L2 E
4.1.2	Length of runway /*Lengte van die loopplank* $= \frac{54}{3{,}28084}$ ✓RT ✓MA = 16,459199… m ✓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 ✓✓O *Dit elimineer obstruksie wat deur eerste ry toeskouers veroorsaak word* **OR/*OF*** ✓✓O To have a clear view of the models on the floor runway. *Om 'n duidelike siglyn van die modelle op die vloerloopplank te hê.*	2O reason (2)	MP L4 E
4.1.3 (b)	✓✓O The other runway is higher than the floor runway *Die ander loopplank is hoër as die vloer-loopplank* **OR/*OF*** ✓✓O Passage where people can pass through/ *Deurgang vir mense* **OR/*OF*** ✓✓O A step between the two runways */'n Trap tussen die twee loopplanke* **OR/*OF*** ✓✓O To avoid collisions/*Om botsings te verhoed*	2O reason (2)	MP L4 E
4.1.4 (a)	Radius = $\frac{1{,}8288m}{2}$ = 0,9144 m ✓A Area of a circle / *Opp. van die sirkel* = 3,142 × $(0{,}9144\ m)^2$ ✓SF = 2,627112… m^2 ✓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)	Circumference / *Omtrek* = 3,142 × 1,8288 m ✓SF = 5,7460896 m ✓CA Length allocated/ *Lengte toegeken* = $\frac{5{,}7460896\ m}{10}$ ✓MCA = 0,5746… m ✓CA	1SF substitution 1CA simplification 1MCA dividing by 10 1CA length per person **NPR** (4)	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	BMI / *LMI* = $\frac{70\text{ kg}}{(1{,}50\text{ m})^2}$ ✓MA ✓MA = 31,11… kg/m^2 ✓A	1MA numerator 1MA denominator 1A correct BMI NPR (3)	M L2 M
4.2.4	100% ✓✓A	2A correct probability (2)	P L2 E
4.2.5*	P = $\frac{5}{6}$ ✓A ✓A = 0,833 ✓CA VALID/ *GELDIG* ✓O	1A Numerator 1A Denominator 1CA simplification 1O opinion (4)	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 / *Buite opp. van kubus* $= 6 \times (4{,}5 \text{ cm})^2$ ✓SF ✓A $= 121{,}5 \text{ cm}^2$ ✓A	1SF substitution 1A simplification 1A unit AO (3)	M L2 E
5.2.1	Total mass / *Totale massa* = 60 × 2 ton = 120 ton ✓MA ✓A $= \frac{120}{0{,}001}$ kg ✓C = 120 000 kg ✓CA **OR/*OF*** 1 ton = 1 000 kg ✓C ✓MA 1 000 kg × 2 = 2 000 kg ✓A Mass of 60 blocks/ *Massa van 60 blokke* = 2 000 × 60 = 120 000 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 cm^3 = volume of ice/ *ys* × 0,92 ✓SF ✓MA $\frac{38500}{0{,}92}$ cm^3 = volume of ice/ *ys* ✓A 41 847,826… cm^3 = volume of ice / *ys*	1SF substitution 1MA changing the subject of the formula 1A volume of ice **NPR** (3)	M L2 M
5.3.1*	Difference / *Verskil* ✓ RT ✓ RT = 3 350 – 2 900 ✓ CA = 450 nautical miles /*seemyl*	1RT 1st value 1RT 2nd value 1CA with subtraction **NPU** **AO** (3)	MP L2 E

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

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