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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**

<b>Symbol/Kode</b>	<b>Explanation/Verduideliking</b>
<b>MA</b>	Method with accuracy/ <i>Metode met akkuraatheid</i>
<b>MCA</b>	Method with constant accuracy/ <i>Metode met volgehoue akkuraatheid</i>
<b>CA</b>	Consistent accuracy/ <i>Volgehoue akkuraatheid</i>
<b>A</b>	Accuracy/ <i>Akkuraatheid</i>
<b>C</b>	Conversion/ <i>Herleiding</i>
<b>S</b>	Simplification/ <i>Vereenvoudiging</i>
<b>RT</b>	Reading from a table/a graph/document/diagram/ <i>Lees vanaf tabel/grafiek/diagram</i>
<b>SF</b>	Correct substitution in a formula/ <i>Korrekte vervanging in formule</i>
<b>O</b>	Opinion/Explanation/Reasoning / <i>Opinie/Verduideliking/redenasie</i>
<b>P</b>	Penalty, e.g. for no units, incorrect rounding off, etc./ <i>Penalisering bv. vir geen eenhede/verkeerde afronding, ens.</i>
<b>R</b>	Rounding off/ <i>Afronding</i>
<b>NPR</b>	No penalty for rounding/ <i>Geen penalisering vir afronding nie</i>
<b>NPU</b>	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>
<b>AO</b>	Answer only/ <i>Slegs antwoord</i>
<b>RCA</b>	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.**

<b>QUESTION/VRAAG 1 [25 MARKS/PUNTE] Answer Only AO - full marks</b>			
<b>Q/V</b>	<b>Solution/Oplossing</b>	<b>Explanation/Verduideliking</b>	<b>T/L</b>
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

<b>Q/V</b>	<b>Solution/Oplossing</b>	<b>Explanation/Verduideliking</b>	<b>T/L</b>
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 <sup>st</sup> 2 correct values 1RT 2 <sup>nd</sup> 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
		<b>[25]</b>	

<b>QUESTION/VRAAG 2 [35 MARKS/PUNTE]</b>			
<b>Q/V</b>	<b>Solution/Oplossing</b>	<b>Explanation/Verduideliking</b>	<b>T/L</b>
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><b>OR/OF</b></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><b>OR/OF</b></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>North table is narrow ✓✓ O or small or limited space./<i>Noord-tafel is baie nou of te min spasie.</i></p> <p><b>OR/OF</b></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:</p> <p>12,7 cm : 12 m ✓ MCA</p> <p>12,7 : 1 200 ✓ C</p> <p>1: 94,49 ✓ CA</p> <p><b>OR/OF</b></p> <p>FS, NW, WC</p> <p>12,4 cm : 12 m ✓ MCA</p> <p>12,4 : 1 200 ✓ C</p> <p>1: 96,77 ✓ CA</p>	<p><b>CA from 2.1.5(a)</b></p> <p>1MCA correct order of the ratio</p> <p>1C conversion</p> <p>1CA simplified unit ratio</p> <p><b>OR/OF</b></p> <p>1MCA correct order of the ratio</p> <p>1C conversion</p> <p>1CA simplified unit ratio</p>	MP L2 M

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p><b>OR/OF</b>  EC, KZN, LP  12,5 cm : 12 m      ✓ MCA  0,125 : 12      ✓ C  1 : 96      ✓ CA</p> <p><b>OR/OF</b>  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><b>OR/OF</b>  1MCA correct order of the ratio  1C conversion  1CA simplified unit ratio  NPR</p> <p>(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>:  <math>\frac{145 \text{ cm}}{36,4 \text{ cm}} = 3,98</math>      ✓ MA  <math>\approx 3</math> packs./<i>pakke</i>.      ✓ R</p> <p>And the width against the table width / <i>breedte teen breedte</i>  <math>\frac{49 \text{ cm}}{24,2 \text{ cm}} = 2,02 = 2</math> packs./<i>pakke</i>      ✓ A</p> <p>Number that can be packed / <i>getal wat gepak kan word</i>  <math>\checkmark</math> MA  <math>= 3 \times 2 = 6</math> packs/<i>pakke</i>      ✓ CA</p> <p>But/<i>Maar</i> <math>36,4 \times 3 = 109,2 \text{ cm}</math>  And/<i>en</i> <math>145 \text{ cm} - 109,2 \text{ cm} = 35,8 \text{ cm}</math>  Pack width wise along table's top length / <i>Breedte teen lengte</i>  <math>\frac{35,8 \text{ cm}}{24,2} = 1,479338843 \approx 1</math> pack      ✓ A</p> <p>Length against the width / <i>lengte teen breedte</i>  <math>\frac{49 \text{ cm}}{36,4} = 1,346153846 \approx 1</math> pack</p> <p>Total number of packs / <i>Totale getal pakke</i>  <math>= 6 + 1 = 7</math>      ✓ CA</p> <p>∴ The maximum is 7 packs / <i>Maksimum is 7 pakke</i></p>	<p>1A calculating half length</p> <p>1MA dividing  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>(8)</p>	MP L3 D
2.3.1*	<p>✓✓ A  South East <b>OR</b> SE./ <i>Suidoos OF SO</i></p>	<p>2A direction</p> <p>(2)</p>	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><b>OR/OF</b></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><b>OR/OF</b></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 <b>OR/OF</b> 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><b>OR/OF</b> 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><b>OR/OF</b> ✓✓ 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: center;">✓ 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><b>OR/OF</b></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></p> $04:55 + 00:35 \quad \checkmark \text{ MA}$ $= 05:30 \quad \checkmark \text{ CA}$ <p>The receptionist will be on time for work. ✓ O <i>Sy sal betyds wees.</i></p> <p><b>OR/OF</b></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: center;">✓ 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><b>OR/OF</b></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><b>OR/OF</b></p> <p style="text-align: center;">✓ 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><b>OR/OF</b></p> <p>1A all the values</p> <p>1MA adding time</p> <p>1CA arrival time</p> <p>1O verification</p> <p><b>OR/OF</b></p> <p>1MA subtracting time</p> <p>1MA adding all values 1A simplification</p> <p>1O verification</p> <p><b>OR/OF</b></p> <p>1A all the values 1MA adding time 1CA arrival time</p> <p>1O verification</p> <p><b>OR/OF</b></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
		<b>[35]</b>	

Please turn over/*Blaai om asseblief*

Q/V	Solution/oplossing	Explanation/Verduideliking	T/L
3.2.3*	<p>5,5 bags of cement make/sakke sement maak 0,75 m<sup>3</sup>  For 1 m<sup>3</sup> the cement / Vir 1 m<sup>3</sup> is die sement  <math>= \frac{5,5}{0,75} \checkmark \text{MA} = 7,33\ldots \text{ bags /sakke } \checkmark \text{A}</math></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  <math>= 7,333\ldots \times 2 = 14,666\ldots \checkmark \text{MA} \checkmark \text{CA}</math></p> <p>Mass of the sand / Massa sand = <math>102 \times 14,666\ldots \checkmark \text{MA}</math>  <math>= 1\,496 \text{ kg } \checkmark \text{CA}</math></p> <p><b>OR/OF</b></p> <p>Sand needed for 0,75 m<sup>3</sup> concrete  Sand nodig vir 0,75 m<sup>3</sup> beton  <math>= 5,5 \times 2 \checkmark \text{MA}</math>  <math>= 11 \text{ wheel barrows /kruise } \checkmark \text{A}</math></p> <p>Mass of sand need for 0,75 m<sup>3</sup> of concrete  Massa sand nodig vir 0,75 m<sup>3</sup> beton  <math>= 11 \times 102 \text{ kg } \checkmark \text{MCA}</math>  <math>= 1\,122 \text{ kg } \checkmark \text{CA}</math></p> <p>Mass of sand for 1 m<sup>3</sup> the concrete  Massa van sand vir 1 m<sup>3</sup> beton  <math>= 1\,122 \text{ kg} \times \frac{1}{0,75} \checkmark \text{MA}</math>  <math>= 1\,496 \text{ kg } \checkmark \text{CA}</math></p> <p><b>OR/OF</b></p> <p>For /Vir 0,75 m<sup>3</sup>: <math>5,5 \times 50 = 275 \text{ kg cement/ement}</math>  <math>\checkmark \text{MA} \checkmark \text{CA}</math>  1 m<sup>3</sup> : <math>275 \div 0,75 = 366,66\ldots \text{ kg cement/ement}</math></p> <p>Mixing ratio / Meng verhouding  1 bag/sak : 2 wheelbarrows sand</p> <p>Cement/ sement 50 kg : 204 kg sand  366,66 : n  <math>n = \frac{366,66}{50} \times 204 \checkmark \text{MCA} \checkmark \text{MA}</math>  <math>= 1\,496 \text{ kg } \checkmark \text{CA}</math></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><b>OR/OF</b></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><b>OR/OF</b></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><b>OR/OF</b></p> <p>✓MCA  <math>5,5 \times 102 \text{ kg} = 561 \text{ kg}</math> ✓MA          So <math>561 \text{ kg} \times 2 = 1\,122 \text{ kg}</math>. ✓A  <math>0,75 \text{ m}^3</math> is <math>1\,122 \text{ kg}</math> ✓CA          So: <math>1 \text{ m}^3</math> will be <math>= \frac{1\,122}{0,75}</math> ✓MA  <math>= 1\,496 \text{ kg}</math> ✓CA</p> <p><b>OR/OF</b></p> <p><math>5,5</math> bags cement/sakke sement is <math>0,75 \text{ m}^3</math> ✓MA  <math>0,75 \text{ m}^3 \div 5,5 = 0,1363636\dots \text{ m}^3</math> per bag /sak ✓A  <math>1 \text{ m}^3 \div 0,13636\dots = 7,333\dots</math> bags/sakke</p> <p>Wheelbarrows/ Kruwaens <math>= 7,333\dots \times 2</math> ✓MA  <math>= 14,666\dots</math> ✓CA</p> <p>Mass / massa <math>= 14,666\dots \times 102 \text{ kg}</math> ✓MA  <math>= 1\,496 \text{ kg}</math> ✓CA</p> <p><b>OR/OF</b></p> <p>Mass/massa in kg <math>= \frac{102}{0,75} \times (5,5 \times 2)</math> ✓MA ✓MA  <math>= 136 \times 11</math> ✓A ✓CA  <math>= 1\,496</math> ✓CA</p>	<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><b>OR/OF</b></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><b>OR/OF</b></p> <p>3MA marks ratio, <math>\times 2</math>, <math>\times</math> mass          1A bags          2CA simplification &amp; final answer</p> <p>(6)</p>	
3.3.1	<p>Area of rectangle/ Opp. van reghoek  <math>= 1,6 \text{ m} \times 125 \text{ mm}</math> ✓SF  <math>= 160 \text{ cm} \times 12,5 \text{ cm}</math> ✓C  <math>= 2\,000 \text{ cm}^2</math></p> <p>Total surface area/ Totale oppervlakte ✓MA  <math>= 2\,000 \text{ cm}^2 \times 2 \text{ sides/kante} \times 12 \text{ posts/pilare}</math>  <math>= 48\,000 \text{ cm}^2</math> ✓CA</p> <p><b>OR/OF</b></p> <p>Area of one face / Opp. van een aansig  <math>= (\frac{125}{10}) \text{ cm} \times (1,6 \times 100) \text{ cm}</math> ✓C ✓SF  <math>= 2\,000 \text{ cm}^2</math>          Area of all the posts / Opp. van al die pilare  <math>= 2\,000 \text{ cm}^2 \times (2 \times 12)</math> ✓MA  <math>= 48\,000 \text{ cm}^2</math> ✓CA</p>	<p>1SF substitution</p> <p>1C converting both</p> <p>1MA multiply by 2 and 12</p> <p>1CA simplification</p> <p><b>OR/OF</b></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><b>OR/OF</b>  <math>\checkmark</math> SF <math>\checkmark</math> C  <math>A = 12,5 \text{ cm} \times 160 \text{ cm} \times 2 \times 12 \checkmark</math> MA  <math>= 48\,000 \text{ cm}^2 \checkmark</math> CA</p> <p><b>OR/OF</b>  <math>\frac{125}{1\,000} = 0,125 \text{ m}</math>  <math>\therefore \text{Area} = \text{length} \times \text{width} / \text{lengte} \times \text{breedte}</math>  <math>= 1,6 \text{ m} \times 0,125 \text{ m} \checkmark</math> SF  <math>= 0,2 \text{ m}^2 (2 \times 12) \checkmark</math> MA  <math>= 4,8 \text{ m}^2 \times 10\,000 \checkmark</math> C  <math>= 48\,000 \text{ cm}^2 \checkmark</math> CA</p> <p><b>OR/OF</b>  <math>\checkmark</math> SF  Area of rectangle <math>= 125 \text{ mm} \times (1,6 \times 1\,000)</math>  Opp. Van reghoek <math>= 125 \text{ mm} \times 1\,600 \text{ mm}</math>  <math>= 200\,000 \text{ mm}^2</math>  In <math>\text{cm}^2 = 200\,000 \div 100 = 2\,000 \text{ cm}^2 \checkmark</math> C  Total surface area <math>= 2\,000 \text{ cm}^2 \times 12 \times 2 \checkmark</math> MA  Totale buite opp. <math>= 48\,000 \text{ cm}^2 \checkmark</math> CA</p>	<p><b>OR/OF</b>  1C converting both  1SF substitution  1MA multiply by 2 and 12  1CA simplification</p> <p><b>OR/OF</b>  1SF substitution  1MA multiply by 2 and 12  1C converting both  1CA simplification</p> <p><b>OR/OF</b>  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  <math>\checkmark</math> SF  <math>= (15,24 \text{ cm} \times 2,5 \text{ cm}) \times 4</math>  <math>= 38,1 \text{ cm}^2 \times 4 = 152,4 \text{ cm}^2 \checkmark</math> CA</p> <p>Area of the 4 top triangles/ Opp. van 4 driehoeke  <math>= (\frac{1}{2} \times \text{base} \times \text{height}) \times 4 \checkmark</math> A  <math>= (\frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm}) \times 4 \checkmark</math> SF  <math>= 59,8932 \text{ cm}^2 \times 4 = 239,5728 \text{ cm}^2 \checkmark</math> CA</p> <p>Total area of 1 post cap / Totale opp. van 1 pilaardop  <math>= 152,4 \text{ cm}^2 + 239,5728 \text{ cm}^2 = 391,97 \text{ cm}^2</math></p> <p>Total area for 12 posts/ Totale opp. vir die 12 pilare  <math>= 391,9728 \text{ cm}^2 \times 12 \checkmark</math> A  <math>\approx 52\,704 \text{ cm}^2 \checkmark</math> MCA</p> <p>VALID/ GELDIG <math>\checkmark</math> O</p>	<p><b>CA post's area from 3.3.1</b>  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><b>OR/OF</b></p> <p>Area of the triangle/ <i>Opp. van driehoek</i>  <math>= (\frac{1}{2} \times \text{base} \times \text{height})</math>  <math>= (\frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm}) \checkmark \text{SF} = 59,8932 \text{ cm}^2 \checkmark \text{CA}</math></p> <p>Area of the rectangle / <i>Opp. van reghoekige deel</i>  <math>= (15,24 \text{ cm} \times 2,5 \text{ cm}) \checkmark \text{SF} = 38,1 \text{ cm}^2 \checkmark \text{CA}</math></p> <p>Area of one face / <i>Opp. van een aansig</i>  <math>= 59,8932 \text{ cm}^2 + 38,1 \text{ cm}^2 = 79,9932 \text{ cm}^2</math></p> <p>Total Area/ <i>Totale opp.</i> <math>= 79,9932 \text{ cm}^2 \times 4 = 391,9728 \text{ cm}^2 \checkmark \text{A}</math></p> <p>Area for 12 caps/ <i>Opp. van 12 pilaardoppe</i>  <math>= 391,9728 \text{ cm}^2 \times 12 = 4703,6736 \text{ cm}^2 \checkmark \text{A}</math></p> <p>Total area to be painted/ <i>Totale opp. om te verf</i>  <math>= 1703,6736 \text{ cm}^2 + 48000 \text{ cm}^2</math>  <math>= 52\,703,6736 \text{ cm}^2</math>  <math>\approx 52\,704 \text{ cm}^2 \checkmark \text{MCA}</math>  <b>VALID/ GELDIG</b> <math>\checkmark \text{O}</math></p> <p><b>OR/OF</b></p> <p>Area of posts / <i>Pilare se opp.</i> <math>= 48\,000 \text{ cm}^2</math></p> <p>Area of all caps (rectangular part)/  <i>Opp. pilaardop (reghoekige deel)</i>  <math>= (15,24 \text{ cm} \times 2,5 \text{ cm}) \times 4 \times 12 \checkmark \text{SF}</math>  <math>= 1828,8 \text{ cm}^2 \checkmark \text{CA}</math></p> <p>Area of all caps (triangular part)/  <i>Opp. pilaardop (driehoekige deel)</i>  <math>\checkmark \text{SF}</math>  <math>= \frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm} \times 4 \times 12 \checkmark \text{A}</math>  <math>= 2874,8736 \text{ cm}^2 \checkmark \text{CA} \checkmark \text{A}</math></p> <p>Total area / <i>Totale opp.</i>  <math>= 1828,8 \text{ cm}^2 + 2\,874 \text{ cm}^2 + 48\,000 \text{ cm}^2</math>  <math>= 52\,703,67 \text{ cm}^2 \approx 52\,704 \text{ cm}^2 \checkmark \text{MCA}</math>  <b>VALID/ GELDIG</b> <math>\checkmark \text{O}</math>  <b>OR/OF</b></p>	<p><b>OR/OF</b></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><b>OR/OF</b></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/Oplossing	Explanation/Verduideliking	T/L
	<p>Area cap triangle / <i>Opp. pilaardop driehoek</i>  <math>= \frac{1}{2} \times 15,24 \text{ cm} \times 7,86 \text{ cm}^2</math> ✓SF  <math>= 59,8932 \text{ cm}^2</math> ✓CA            So: <math>59,8932 \times 4 = 239,5728 \text{ cm}^2</math>  <math>239,5728 \text{ cm}^2 \times 12 = 2\,874,8736 \text{ cm}^2</math></p> <p>Area rectangle/ <i>Reghoekige opp.</i> <math>= 15,24 \text{ cm} \times 2,5 \text{ cm}</math> ✓SF  <math>= 38,1 \text{ cm}^2</math> ✓CA            So: <math>38,1 \text{ cm}^2 \times 4 = 152,4 \text{ cm}^2</math> ✓A  <math>152,4 \text{ cm}^2 \times 12 = 1\,828,8 \text{ cm}^2</math> ✓A</p> <p>Total area <math>= 1828,8 \text{ cm}^2 + 2\,874 \text{ cm}^2 + 48\,000 \text{ cm}^2</math>  <i>Totale opp.</i> <math>= 5\,2703,67 \text{ cm}^2</math>  <math>\approx 5\,2704 \text{ cm}^2</math> ✓MCA</p> <p>VALID/ <i>GELDIG</i> ✓O</p> <p><b>OR/OF</b>            Total area to be painted / <i>Opp. om te verf</i> in <math>\text{cm}^2</math>  <math>\checkmark\text{A} \quad \checkmark\text{A} \quad \checkmark\text{SF}</math> ✓SF  <math>= (12 \times 4 \times 0,5 \times 15,24 \times 7,86) + (12 \times 4 \times 15,24 \times 2,5)</math>  <math>\checkmark\text{CA} \quad \checkmark\text{CA}</math>  <math>= 2\,874,8736 + 1\,828,8</math>  <math>= 4\,703,6736</math>  <math>= 4\,704</math>            Posts + Caps <math>= 48\,000 + 4\,704</math>  <math>= 52\,704</math> ✓MCA</p> <p>VALID/ <i>GELDIG</i> ✓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><b>OR/OF</b>            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 <math>\text{m}^2</math> / <i>Opp. in <math>\text{m}^2</math></i>  <math>= 52\,704 \div 100^2</math>  <math>= 5,2704 \text{ m}^2</math> ✓C</p> <p>Number of litres needed / <i>Getal liter nodig</i>  <math>= 5,2704 \times 12,46</math> ✓MCA  <math>= 65,669...</math> ✓CA  <math>\approx 66</math></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> <b>OR/OF</b> $\checkmark\checkmark$ 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> <b>OR/OF</b> $\checkmark\checkmark$ O Passage where people can pass through/ <i>Deurgang vir mense</i> <b>OR/OF</b> $\checkmark\checkmark$ O A step between the two runways / <i>n Trap tussen die twee loopplanke</i> <b>OR/OF</b> $\checkmark\checkmark$ 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/Oplissing	Explanation/Verduideliking	T/L
4.1.4 (b)	<p>Circumference / <i>Omtrek</i> = <math>3,142 \times 1,8288 \text{ m}</math> ✓SF  = 5,7460896 m ✓CA</p> <p>Length allocated/ <i>Lengte toegeken</i> = <math>\frac{5,7460896 \text{ m}}{10}</math> ✓MCA  = 0,5746... m ✓CA</p>	<p>1SF substitution  1CA simplification</p> <p>1MCA dividing by 10  1CA length per person  <b>NPR</b></p> <p>(4)</p>	M L3 M
4.2.1	XS ✓✓RT	<p>2RT correct size</p> <p>(2)</p>	M L1 E
4.2.2	80 kg ✓✓RT	<p>2RT correct weight</p> <p>(2)</p>	M L2 E
4.2.3	<p>BMI / <i>LMI</i> = <math>\frac{70 \text{ kg}}{(1,50 \text{ m})^2}</math> ✓MA  ✓MA</p> <p>= 31,11... kg/m<sup>2</sup> ✓A</p>	<p>1MA numerator  1MA denominator</p> <p>1A correct BMI  <b>NPR</b></p> <p>(3)</p>	M L2 M
4.2.4	100% ✓✓A	<p>2A correct probability</p> <p>(2)</p>	P L2 E
4.2.5*	<p>P = <math>\frac{5}{6}</math> ✓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</p> <p>(4)</p>	P L4 M
		<b>[30]</b>	

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> $= 6 \times (4,5 \text{ cm})^2$ ✓SF $= 121,5 \text{ cm}^2$ ✓A	1SF substitution 1A simplification 1A unit AO (3)	M L2 E
5.2.1	$\begin{aligned} \text{Total mass / Totale massa} &= 60 \times 2 \text{ ton} = 120 \text{ ton} \quad \checkmark\text{MA} \quad \checkmark\text{A} \\ &= \frac{120}{0,001} \text{ kg} \quad \checkmark\text{C} \\ &= 120\,000 \text{ kg} \quad \checkmark\text{CA} \end{aligned}$ <b>OR/OF</b> 1 ton = 1 000 kg ✓C $1\,000 \text{ kg} \times 2 = 2\,000 \text{ kg} \quad \checkmark\text{MA}$ $1\,000 \text{ kg} \times 2 = 2\,000 \text{ kg} \quad \checkmark\text{A}$ 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  <b>OR/OF</b> 1C conversion 1MA multiplying by 2 1A simplification  1CA simplification (4)	M L1 E
5.2.2	$38\,500 \text{ cm}^3 = \text{volume of ice/ ys} \times 0,92 \quad \checkmark\text{SF}$ $\frac{38\,500}{0,92} \text{ cm}^3 = \text{volume of ice/ ys} \quad \checkmark\text{MA}$ $41\,847,826\dots \text{ cm}^3 = \text{volume of ice / ys} \quad \checkmark\text{A}$	1SF substitution  1MA changing the subject of the formula  1A volume of ice <b>NPR</b> (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 <sup>st</sup> value 1RT 2 <sup>nd</sup> value 1CA with subtraction <b>NPU</b> <b>AO</b> (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  <math>= 3\,950 \times 1,151</math> ✓ C  <math>= 4\,546,45</math> miles.</p> <p>Distance in km / <i>Afstand in km</i></p> <p><math>= \frac{4\,546,45}{0,6215}</math> ✓ C  <math>= 7\,315,285599</math> km ✓ CA</p> <p><b>OR/OF</b>  Distance / <i>afstand</i> in km:</p> <p>✓ RT  <math>3\,950 \times \frac{1,151}{0,6215}</math> ✓ C  <math>= 7\,315,285599</math> 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><b>OR/OF</b></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> <math>\times</math> 10 days/<i>dae</i> 4 hours/<i>uur</i> ✓ SF  2 607 = speed/ <i>spoed</i> <math>\times</math> 244 hours/<i>uur</i>  <math>\frac{2\,607}{244} = \text{speed}/\text{spoed}</math> ✓ MA  ✓ R  Ave speed/<i>spoed</i> <math>\approx</math> 10,68 nautical miles/hour /<i>seemyl/uur</i></p> <p><b>OR/OF</b></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><math>= \frac{3\,350 \times 244}{2\,607}</math>  <math>= 313,54</math></p> <p>Ave Speed/<i>Gem.Spoed</i> = <math>\frac{\text{distance}}{\text{time}}</math> ✓ MA</p> <p><math>= \frac{3\,350 + 2\,607}{313,54 + 244}</math> ✓ SF  <math>= \frac{5\,957}{557,54}</math>  ✓ R  <math>= 10,68</math> nautical miles/hour /<i>seemyl/uur</i></p>	<p>1C conversion  1SF substitution</p> <p>1MA changing subject of formula  1R simplification correctly rounded</p> <p><b>OR/OF</b></p> <p>1C conversion</p> <p>1MA changing subject of formula  1SF substitution</p> <p>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 = <math>\frac{3\,350 \text{ miles}}{10,68 \text{ nautical miles /hour}}</math> ✓ MA  = 313,67 hours ✓ CA  = <math>\frac{313,67 \text{ hours}}{24 \text{ hours}}</math> ✓ 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><b>OR/OF</b>  Ship travels 2 607 in 244 hours  3 350 in <math>n</math> hours  <math>n = \frac{3\,350 \times 244}{2\,607}</math> ✓ MA  = 313,5404679708 ✓ CA  = 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><b>CA from 5.3.3 (a)</b>  1MA dividing by speed  1CA hours  1C conversion  1CA number of days  1CA hours  1CA correct date and time</p> <p><b>OR/OF</b>  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]	
		<b>TOTAL/ TOTAAL: 150</b>	