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# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

**SENIOR CERTIFICATE EXAMINATIONS/  
NATIONAL SENIOR CERTIFICATE EXAMINATIONS  
*SENIORSERTIFIKAAT-EKSAMEN  
NASIONALE SENIORSERTIFIKAAT-EKSAMEN***

**MATHEMATICAL LITERACY P2/WISKUNDIGE GELETTERDHEID V2**

**2023**

**MARKING GUIDELINES/NASIENRIGLYNE**

**MARKS/PUNTE: 150**

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

**These marking guidelines consist of 17 pages.  
*Hierdie nasienriglyne bestaan uit 17 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.
- In order to award the verification / conclusion mark the candidate must have scored at least one mark in the calculations preceding the final conclusion.

**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 afsonderlike punt.
- Ten einde die verifikasie/ gevolgtrekking punt toe te ken moes die kandidaat ten minste een punt gekry het in die berekening wat lei tot die finale gevolgtrekking.

**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 [28 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	E ✓✓A	2A correct option (2)	M L1 E
*1.1.2	C ✓✓A	2A correct option (2)	M L1 E
*1.1.3	I ✓✓A	2A correct option (2)	MP L1 E
*1.1.4	B ✓✓A	2A correct option (2)	MP L1 E
*1.1.5	G ✓✓A	2A correct option (2)	P L1 E

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
1.2.1	✓RT ✓RT ✓RT Potatoes, Onions and Cucumber <i>Aartappels, Uie en Komkommer</i>	3RT correct partner (3)	MP L1 E
1.2.2	Six /Ses (6) ✓✓ RT	2RT correct number (2)	MP L1 M
1.2.3	Beans /Bone ✓✓ RT	2RT correct partner (2)	MP L1 M
*1.2.4	South East <b>OR</b> SE ✓✓ RT <i>Suidoos <b>OF</b> SO</i>	2RT correct direction (2)	MP L1 M
*1.2.5	✓✓RT ✓ RT 3 and 7	2RT 1 <sup>st</sup> correct number label 1RT 2 <sup>nd</sup> correct number label (3)	MP L1 E
1.3.1	C <b>OR/OF</b> $\pi \times r^2 \times h$ ✓✓ RT	2A correct option (2)	M L1 E
1.3.2	mm <sup>3</sup> ✓✓ A	2A correct unit (2)	M L1 E
1.3.3	mm to metre = $124 \div 1\,000$ ✓C <i>mm tot meter</i> = 0,124 m ✓ A	1C correct conversion/dividing by 1 000 1A answer in metres (2)	M L1 E
		<b>[28]</b>	

QUESTION/VRAAG 2 [24 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
2.1.1	5 ✓✓ A	2A correct number (2)	MP L1 E
2.1.2	Tripod/Driepoot ✓✓ A	2A correct item (2)	MP L1 E
2.1.3	Clockwise/Kloksgewys ✓✓ A	2A correct direction (2)	MP L1 E
2.1.4 (a)	H ✓✓ A	2 A correct choice (2)	MP L2 M
2.1.4 (b)	G ✓✓ A	2 A correct choice (2)	MP L2 M
2.2.1	<p>65 km <math>\times</math> 100 000</p> <p>= 6 500 000 cm ✓C</p> <p>Distance on the map /Afstand op kaart</p> <p>= <math>\frac{6\,500\,000}{250\,000}</math> ✓MA</p> <p>= 26 cm ✓CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>65 km <math>\times</math> 1 000 000</p> <p>= 65 000 000 mm ✓C</p> <p>Distance on the map /Afstand op kaart</p> <p>= <math>\frac{65\,000\,000}{250\,000}</math> ✓MA</p> <p>= 260 mm ✓CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Map: Reality Kaart : Werklikheid 1: 250 000 Map Dist/Kaart afstand : 65 km Map distance = <math>\frac{65}{250\,000}</math> Kaart afstand = 0,00026 km ✓C = (0,00026 <math>\times</math> 100 000) cm = 26 cm ✓CA</p>	<p>1C conversion</p> <p>1MA division by 250 000</p> <p>1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1C conversion</p> <p>1MA division by 250 000</p> <p>1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1MA division by 250 000</p> <p>1C conversion</p> <p>1CA simplification</p>	MP L2 D

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p style="text-align: center;"><b>OR/OF</b></p> <p>1 cm: 250 000 cm  <math>\therefore 1 \text{ cm} : 2,5 \text{ km} \quad \checkmark \text{C}</math>  <math>\therefore 1 : 2,5 \text{ km}</math>  Map Dist/<i>Kaart afstand</i> : 65 km</p> <p>Map distance /<i>Kaart afstand</i>  <math>= \frac{65}{2,5} \quad \checkmark \text{MA}</math>  <math>= 26 \text{ cm} \quad \checkmark \text{CA}</math></p>	<p>1C conversion</p> <p>1MA division by 2,50</p> <p>1CA simplification</p> <p style="text-align: right;">(3)</p>	
2.2.2	<p>Bar scale or line scale or Graphic Scale <math>\checkmark \checkmark \text{A}</math>  <i>Staafskaal/ Balkskaal of lynskaal of Grafiese skaal</i></p>	<p>2A correct scale</p> <p style="text-align: right;">(2)</p>	<p>MP L1 E</p>
*2.3.1	<p>Number of reams lengthwise/ <i>Getal rieme in die lengte</i>  <math>\checkmark \text{MA}</math>  <math>= \frac{102 \text{ cm}}{27,94 \text{ cm}} = 3,65 \approx 3 \quad \checkmark \text{A} \quad \checkmark \text{R}</math></p> <p>Number of reams widthwise /<i>Getal rieme in die breedte</i>  <math>= \frac{44 \text{ cm}}{21,59 \text{ cm}} = 2,04 \approx 2 \quad \checkmark \text{MCA}</math></p> <p>Number of reams heightwise/<i>Getal rieme in die hoogte</i>  <math>= \frac{39 \text{ cm}}{6,35 \text{ cm}} = 6,14 \approx 6 \quad \checkmark \text{A}</math></p> <p>Total number of reams/<i>Totale getal rieme</i>  <math>= 3 \times 2 \times 6 \quad \checkmark \text{MCA}</math>  <math>= 36 \quad \checkmark \text{CA}</math></p>	<p>1MA dividing lengths  1A simplification  1R rounding down</p> <p>1MC A reams widthwise</p> <p>1A reams heightwise</p> <p>1MCA multiplying the values  1CA total number of reams</p> <p style="text-align: right;">(7)</p>	<p>MP L3 M</p>

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
2.3.2	<p>✓✓O</p> <p>To keep them dust free/<i>Om stof af te keer</i> To keep the reams dry/ moisture free <i>Om die rieme droog te hou</i></p> <p><b>OR/OF</b> To keep them safe for later use. <i>Om hulle veilig te bêre vir latere gebruik</i></p> <p><b>OR/OF</b> Glass door - For learners to see that the teacher is using their reams of paper – Easy to see how many reams are left (record keeping). <i>Glasdeure - Sodat leerders kan sien hul onderwyser gebruik hulle rieme papier</i> <i>--maklik om te sien hoeveel rieme is oor (hou rekord)</i></p> <p><b>OR/OF</b> Convenient –Paper is in the class for later usage. –Keeps the teacher's table clear/more space on teacher's table –Easily accessible when needed. –Effective use of space <i>Gerieflik:</i> – <i>die papier is in die klas gereed vir later gebruik</i> – <i>Hou die onderwyser se tafel skoon /meer spasie op die onderwyser se tafel</i> – <i>Maklike toegang te hê</i> – <i>Effektiewe gebruik van spasie</i></p> <p><b>OR/OF</b> Keeps the classroom neat and in order. <i>Hou die klaskamer netjies en skep orde.</i></p>	<p>2O reason</p> <p>(2)</p>	<p>MP L4 E</p>
		[24]	

QUESTION/VRAAG 3 [31 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
3.1.1	<p>Surface area wall 1 = length <math>\times</math> width  <i>Oppervlakte muur 1 = lengte <math>\times</math> breedte</i></p> <p>= 4,8 m <math>\times</math> 2,75 m    ✓SF</p> <p>= 13,2 m<sup>2</sup>    ✓CA</p> <p>Surface area wall 2 = length <math>\times</math> width  <i>Oppervlakte muur 2 = lengte <math>\times</math> breedte</i></p> <p>= 3,50 m <math>\times</math> 2,75 m</p> <p>= 9,6250 m<sup>2</sup>    ✓A</p> <p>Total surface area / <i>Totale oppervlakte</i></p> <p>= (13,2 + 9,625) m<sup>2</sup></p> <p>= 22,8250 m<sup>2</sup>    ✓CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p style="text-align: center;">✓SF</p> <p>T SA/ TO = (4,8 m <math>\times</math> 2,75 m) + (3,5 m <math>\times</math> 2,75 m)</p> <p style="text-align: center;">= 13,2 m<sup>2</sup> + 9,6250 m<sup>2</sup>    ✓CA    ✓A</p> <p style="text-align: center;">= 22,8250 m<sup>2</sup>    ✓CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p style="text-align: center;">✓A</p> <p>Surface Area = (3,5 m + 4,8 m) <math>\times</math> 2,75 m    ✓SF</p> <p style="text-align: center;">= 8,3 <math>\times</math> 2,75    ✓CA</p> <p style="text-align: center;">= 22,825 m<sup>2</sup>    ✓CA</p>	<p>1SF substitution</p> <p>1CA simplification</p> <p>1A simplification</p> <p>1CA simplification</p> <p><b>OR/OF</b></p> <p>1SF substitution</p> <p>1CA simplification</p> <p>1A simplification</p> <p>1CA simplification</p> <p><b>OR/OF</b></p> <p>1A adding both wall dimensions</p> <p>1SF substitution</p> <p>1CA simplification</p> <p>1CA simplification</p> <p><b>NPR</b></p> <p style="text-align: right;">(4)</p>	M L2 M
*3.1.2	<p>Volume = Area of wall <math>\times</math> thickness of plaster  <i>Volume = Opp van muur <math>\times</math> dikte van pleister</i></p> <p style="text-align: center;">= (22,8250 <math>\times</math> 10 000) <math>\times</math> <math>\frac{12}{10}</math>    ✓C    ✓SF</p> <p style="text-align: center;">= 228 250 cm<sup>2</sup> <math>\times</math> 1,2 cm    ✓CA</p> <p style="text-align: center;">= 273 900 cm<sup>3</sup>    ✓CA</p>	<p><b>CA from 3.1.1</b></p> <p>2C conversion</p> <p>1SF substitution</p> <p>1CA simplification</p> <p>1CA simplification</p>	M L3 D

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p style="text-align: center;"><b>OR/OF</b></p> <p>12 mm = 1,2 cm ✓C</p> <p><math>22,825\text{m}^2 = (22,825 \times 100 \times 100) \text{ cm}^2</math> ✓C  <math>= 228\,250 \text{ cm}^2</math> ✓CA</p> <p>Volume = Area of wall <math>\times</math> thickness of plaster  <i>Volume = Opp van muur <math>\times</math> dikte van pleister</i>  <math>= 228\,250 \text{ cm}^2 \times 1,2 \text{ cm}</math> ✓SF  <math>= 273\,900 \text{ cm}^3</math> ✓CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>12 mm = (12 <math>\div</math> 1 000)  <math>= 0,012 \text{ m}</math> ✓C</p> <p>Volume = <math>22,825 \times 0,012</math> ✓SF  <math>= 0,2739 \text{ m}^3</math> ✓CA  <math>= (0,2739 \times 100 \times 100) \text{ cm}^3</math> ✓C  <math>= 273\,900 \text{ cm}^3</math> ✓CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Volume = <math>22\,825\,000 \text{ mm}^2 \times 12 \text{ mm}</math> ✓C ✓SF  <math>= 273\,900\,000 \text{ mm}^3</math> ✓CA  <math>= 273\,900 \text{ cm}^3</math> ✓C<sub>3</sub> ✓CA</p>	<p>1C conversion mm to cm</p> <p>1C conversion m<sup>2</sup> to cm<sup>2</sup>  1CA simplification</p> <p>1SF substitution  1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1C conversion m</p> <p>1SF substitution  1CA simplification  1C conversion m<sup>3</sup> to cm<sup>3</sup>  1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1C conversion mm<sup>2</sup>  1SF substitution</p> <p>1CA simplification</p> <p>1C conversion cm<sup>3</sup>  1CA simplification</p> <p style="text-align: right;">(5)</p>	
3.1.3	<p>Number of bags/ <i>Getal sakke</i></p> <p><math>= \frac{273\,900 \text{ cm}^3}{15\,000 \text{ cm}^3}</math> ✓MCA  <math>= 18,26</math> ✓CA  <math>\approx 19</math> ✓R</p>	<p><b>CA from 3.1.2</b></p> <p>1MCA dividing</p> <p>1CA simplification</p> <p>1R rounding up</p> <p style="text-align: right;">(3)</p>	M L2 M
3.1.4	<p>Perimeter / <i>Omtrek</i></p> <p><math>= 2 \times (4,8 + 3,5) \text{ m}</math> ✓RT ✓SF  <math>= 16,6 \text{ m}</math> ✓CA</p> <p style="text-align: center;"><b>OR/OF</b></p>	<p>1SF substitution  1RT correct values</p> <p>1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p>	M L2 E

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	Perimeter/ Omtrek $= 4,8 \text{ m} + 3,5 \text{ m} + 4,8 \text{ m} + 3,5 \text{ m}$ ✓MA ✓RT $= 16,6 \text{ m}$ ✓CA <b>OR/OF</b> Perimeter/Omtrek ✓MA $= 2(3,5 \text{ m}) + 2(4,8 \text{ m})$ ✓RT $= 16,6 \text{ m}$ ✓CA	1MA adding all 4 sides 1RT correct values 1CA simplification <b>OR/OF</b> 1MA adding all 4 sides 1RT correct values 1CA simplification <b>AO</b> (3)	
3.2.1	$P = \frac{1}{5}$ ✓A or/of 0,2 or/of 20% ✓A	1A numerator 1A denominator <b>AO</b> (2)	P L2 E
*3.2.2	$P(\text{not appear/ nie verskyn}) = 1 - 0,75$ ✓MA $= 0,25$ ✓A or/of $\frac{1}{4}$ or/of 25%	1MA subtracting from 1 1A simplification <b>AO</b> (2)	P L2 M
3.2.3	Less likely /kleiner kans ✓✓A	<b>CA from Q3.2.2</b> 2A correct likelihood (2)	P L2 E
*3.3.1	Starting time /Begin tyd $= 08:05 - 2 \text{ min} - 3 \text{ min} - 4 \text{ min}$ ✓MA ✓A $= 07:56$ ✓CA <b>OR/OF</b> Total time to prepare: $= 4 \text{ min} + 3 \text{ min} + 2 \text{ min}$ $= 9 \text{ min}$ ✓A Starting time /Begin tyd $= 08:05 - 9 \text{ min}$ ✓MA $= 07:56$ ✓CA or 4 minutes to eight in the morning	1MA subtract minutes 1A all the minutes 1CA simplification <b>OR/OF</b> 1A all the minutes 1MA subtract minutes 1CA simplification <b>AO</b> (3)	M L2 M

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
3.3.2	<p>Total volume of water /totale volume water</p> $= 7 \ell \times 5 = 35 \ell \quad \checkmark \text{MA}$ <p>1 gallon/gelling = 3,78541 ℓ</p> <p>Number of gallons /Getal gellings</p> $= \frac{35}{3,78541} \quad \checkmark \text{C}$ $= 9,24602619 \approx 9,25 \quad \checkmark \text{R}$ <p style="text-align: center;"><b>OR/OF</b></p> <p>1 gallon/gelling = 3,78541 ℓ</p> $n = 7 \ell$ <p>Number of gallons /Getal gellings</p> $= \frac{7}{3,78541} \quad \checkmark \text{C}$ $= 1,849205... \approx 1,85$ <p>For 5 bags/Vir 5 sakke</p> $= 1,85 \times 5 = 9,25 \text{ gallon / gelling} \quad \checkmark \text{MA} \quad \checkmark \text{R}$	<p>1MA multiplying with 5</p> <p>1C converting</p> <p>1R rounded answer</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1C converting</p> <p>1MA multiplying with 5 1R rounded answer</p> <p style="text-align: right;">(3)</p>	M L2 M
3.3.3	$^{\circ}\text{F} - 32^{\circ} = (1,8 \times ^{\circ}\text{C})$ $73,4 - 32^{\circ} = (1,8 \times ^{\circ}\text{C}) \quad \checkmark \text{SF}$ $41,4^{\circ} = 1,8 \times ^{\circ}\text{C} \quad \checkmark \text{S}$ $^{\circ}\text{C} = 41,4^{\circ} \div 1,8 \quad \checkmark \text{MCA}$ $= 23^{\circ}\text{C} \quad \checkmark \text{CA}$	<p>1SF correct substitution 1S simplification</p> <p>1MCA dividing by 1,8</p> <p>1CA simplification</p> <p style="text-align: right;">(4)</p>	M L2 M
		<b>[31]</b>	

QUESTION/VRAAG 4 [30 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
4.1.1	12 ✓✓ RT	2RT number of houses (2)	MP L2 E
4.1.2	✓✓ RT ✓ RT 1, 2 or/of 12 Any two /Enige twee	2RT 1 <sup>st</sup> house label or number 1RT second (3)	MP L2 M
*4.2.1	The depth 1m or it is shallow/ not too deep. ✓✓ O <i>Die diepte is 1m of dit is vlak/ nie te diep nie.</i>	2O explanation (2)	M L4 M
4.2.2	✓✓ A <b>Capacity:</b> the maximum amount of water the pool can hold/contain. <b>Kapasiteit</b> is die maksimum hoeveelheid water wat die swembad kan hou. <b>OR/OF</b> <b>Capacity:</b> a measure of space covered by pool structure with water. <b>Kapasiteit</b> is die mate van spasie wat die swembad met water vul.	2A concept (2)	M L1 M
*4.2.3	$\text{Volume}_{(\text{cylinder})} = 3,142 \times \left(\frac{7}{2}\text{m}\right)^2 \times 1\text{m} \quad \checkmark \text{A} \quad \checkmark \text{SF}$ $= 3,142 \times (3,5\text{m})^2 \times 1\text{m}$ $= 38,4895 \text{ m}^3 \quad \checkmark \text{CA}$ $\text{Volume}_{(\text{rectangular})} = 6,2 \text{ m} \times 3,25 \text{ m} \times 1,65 \text{ m} \quad \checkmark \text{SF}$ $= 33,2475 \text{ m}^3 \quad \checkmark \text{CA}$ $\text{Difference / Verskil} = 38,4895 \text{ m}^3 - 33,2475 \text{ m}^3 \quad \checkmark \text{MCA}$ $= 5,242 \text{ m}^3 \quad \checkmark \text{CA}$ $= 5\,242 \text{ l} \quad \checkmark \text{C}$ <b>OR/OF</b>	1A radius 1SF correct substitutions  1CA simplification  1SF correct values 1CA rectangular volume  1MCA subtracting 1CA difference 1C conversion  <b>OR/OF</b>	M L3 M

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	$\text{Volume}_{(\text{cylinder})} = 3,142 \times (3,5\text{m})^2 \times 1\text{m} \times 1\,000 \text{ l/m}^3$ $= 38\,489,5 \text{ l}$ $\text{Volume}_{(\text{rectangular})} = 6,2 \text{ m} \times 3,25 \text{ m} \times 1,65 \text{ m} \times 1\,000 \text{ l/m}^3$ $= 33\,247,5 \text{ l}$ $\text{Difference / Verskil} = 38\,489,5 \text{ l} - 33\,247,5 \text{ l}$ $= 5\,242 \text{ l}$	1A radius 1SF correct substitutions 1C conversion 1CA simplification  1SF correct values 1CA rectangular volume  1MCA subtracting  1CA difference <b>NPR</b>  (8)	
4.2.4 (a)	To accommodate cutting the tiles <b>or</b> breakages <b>or</b> curved surfaces <b>or</b> keep spares for later usage. <i>Om voorsiening te maak die sny van teëls of breekskade of die gekurfde oppervlakte of om oor te hou vir latere gebruik.</i>	2O reason  (2)	M L4 E
*4.2.4 (b)	$\text{SA}_{(\text{open cylinder})}/BO = 3,142 \times \text{radius} \times (\text{radius} + 2 \times \text{height})$ $= 3,142 \times 3,5 \text{ m} \times (3,5 \text{ m} + 2 \times 1 \text{ m})$ $= 3,142 \times 3,5 \text{ m} \times 5,5 \text{ m} = 60,4835 \text{ m}^2$ Area of one tile/ <i>Opp van 1 teël</i> $= \frac{20}{100} \text{ m} \times \frac{20}{100} \text{ m}$ $= 0,2 \times 0,2 \text{ m}^2 = 0,04 \text{ m}^2$ Number of tiles needed / <i>Getal teëls nodig</i> $= \frac{\text{Area to be tiled}}{\text{Area of single tile}}$ $= \frac{60,4835}{0,04}$ $= 1\,512,0875$ Plus 10% $= \frac{10}{100} \times 1\,512,0875 + 1\,512,0875$ $= 1\,663,29625 \text{ tiles /teëls}$ $\approx 1\,664 \text{ tiles /teëls}$ Number of boxes / <i>Getal bokse</i> $= 1\,664 \div 16$ $= 104$ <b>VALID/GELDIG</b>	<b>CA radius form 4.2.3</b> 1SF substitution 1CA area of pool  1C conversion 1CA area of a tile  1MCA finding number of tiles 1CA simplification  1MCA calc. 10% and adding it <b>or</b> multiply with 1,10  1CA number of tiles  1MCA dividing 1CA number of boxes 1O conclusion	M L4 D

Or rounded up:

$$1\,513 \times 110\%$$

$$= 1\,664,3$$

$$\approx 1665$$

Boxes

$$= 1\,665 \div 16$$

$$= 104,06$$

$$\approx 105$$

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p style="text-align: center;"><b>OR/OF</b></p> <p> <math>SA_{(\text{open cylinder})}/BO = 3,142 \times \text{radius} \times (\text{radius} + 2 \times \text{height})</math>  <math>= 3,142 \times 3,5 \text{ m} \times (3,5 \text{ m} + 2 \times 1 \text{ m}) \quad \checkmark \text{ SF}</math>  <math>= 3,142 \times 3,5 \text{ m} \times 5,5 \text{ m} = 60,4835 \text{ m}^2. \quad \checkmark \text{ CA}</math> </p> <p>           Area of one tile/ <i>Opp van 1 teël</i>  <math>= \frac{20}{100} \text{ m} \times \frac{20}{100} \text{ m} \quad \checkmark \text{ C}</math>  <math>= 0,2 \times 0,2 \text{ m}^2 = 0,04 \text{ m}^2. \quad \checkmark \text{ CA}</math> </p> <p>           Number of tiles needed / <i>Getal teëls nodig</i>  <math>= \frac{\text{Area to be tiled}}{\text{Area of single tile}}</math>  <math>= \frac{60,4835}{0,04} \quad \checkmark \text{ MCA}</math>  <math>= 1\,512,0875 \quad \checkmark \text{ CA} \quad \textbf{OR/OF} \approx 1\,513</math> </p> <p>           Number of boxes/ <i>Getal bokse</i>  <math>= 1\,512,0875 \div 16 \quad \checkmark \text{ MCA}</math>  <math>= 94,505... \quad \checkmark \text{ CA}</math> </p> <p>           Increased number/ <i>Verhoogde getal</i>  <math>= 94,505... \times 110\% \quad \checkmark \text{ MCA}</math>  <math>= 103,95... \quad \checkmark \text{ CA}</math>  <math>\approx 104</math>  <b>VALID/GELDIG</b> <math>\checkmark \text{ O}</math> </p> <p style="text-align: center;"><b>OR/OF</b></p> <p> <math>SA_{(\text{open cylinder})}/BO = 3,142 \times \text{radius} \times (\text{radius} + 2 \times \text{height})</math>  <math>= 3,142 \times 3,5 \text{ m} \times (3,5 \text{ m} + 2 \times 1 \text{ m}) \quad \checkmark \text{ SF}</math>  <math>= 3,142 \times 3,5 \text{ m} \times 5,5 \text{ m} = 60,4835 \text{ m}^2. \quad \checkmark \text{ CA}</math> </p> <p>           Area of one tile/ <i>Opp van 1 teël</i>  <math>= \frac{20}{100} \text{ m} \times \frac{20}{100} \text{ m} \quad \checkmark \text{ C}</math>  <math>= 0,2 \times 0,2 \text{ m}^2 = 0,04 \text{ m}^2. \quad \checkmark \text{ CA}</math> </p>	<p>1SF substitution</p> <p>1CA SA of pool</p> <p>1C conversion</p> <p>1CA area of a tile</p> <p>1MCA finding number of tiles</p> <p>1CA simplification</p> <p>1MCA dividing</p> <p>1CA number of boxes</p> <p>1MCA calc. 10% and adding it <b>or</b> multiply with 1,10</p> <p>1CA number of boxes</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1SF substitution</p> <p>1CA area of pool</p> <p>1C conversion</p> <p>1CA area of a tile</p>	

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p>Continue</p> <p>Area covered by one box/<i>Opp wat een boks bedek</i>  <math>= 0,04 \text{ m}^2 \times 16</math> ✓ MCA  <math>= 0,64 \text{ m}^2</math> ✓ CA</p> <p>Number of boxes/<i>Getal bokse</i>  <math>= \frac{60,4835}{0,64}</math> ✓ MCA  <math>= 94,505\dots</math> ✓ CA</p> <p>Increased number/<i>Verhoogde getal</i>  <math>= 94,505\dots \times 110\%</math> ✓ MCA  <math>= 103,95\dots</math> ✓ CA  <math>\approx 104</math>          VALID/<i>GELDIG</i> ✓ O</p> <p style="text-align: center;"><b>OR/OF</b></p> <p><math>SA_{(\text{open cylinder})}/BO = 3,142 \times \text{radius} \times (\text{radius} + 2 \times \text{height})</math>  <math>= 3,142 \times 3,5 \text{ m} \times (3,5 \text{ m} + 2 \times 1 \text{ m})</math> ✓ SF  <math>= 3,142 \times 3,5 \text{ m} \times 5,5 \text{ m} = 60,4835 \text{ m}^2</math>. ✓ CA</p> <p>Increased area/<i>Vergrote opp</i>  <math>= 60,4835 \times 1,1</math> ✓ MCA  <math>= 66,53185</math> ✓ CA</p> <p>Area of one tile/<i>Opp van 1 teël</i>  <math>= \frac{20}{100} \text{ m} \times \frac{20}{100} \text{ m}</math> ✓ C  <math>= 0,2 \times 0,2 \text{ m}^2 = 0,04 \text{ m}^2</math>. ✓ CA</p> <p>Area covered by one box/<i>Opp wat een boks bedek</i>  <math>= 0,04 \text{ m}^2 \times 16</math> ✓ MCA  <math>= 0,64 \text{ m}^2</math> ✓ CA</p> <p>Number of boxes/<i>Getal bokse</i>  <math>= \frac{66,53185}{0,64}</math> ✓ MCA  <math>= 103,956\dots</math>  <math>\approx 104</math> ✓ CA          VALID/<i>GELDIG</i> ✓ O</p>	<p>1MCA finding area of box of tiles 1CA simplification</p> <p>1MCA dividing 1CA number of boxes</p> <p>1MCA calc. 10% and adding it <b>or</b> multiply with 1,10 1CA number of boxes 1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1SF substitution 1CA area of pool</p> <p>1MCA calc. 10% and adding it <b>or</b> multiply with 1,10 1CA simplification</p> <p>1C conversion 1CA area of a tile</p> <p>1MCA finding area of box of tiles 1CA simplification</p> <p>1MCA dividing 1CA number of boxes 1O conclusion</p> <p style="text-align: right;">(11)</p>	
		<b>[30]</b>	

Please turn over/*Blaai om asseblief*

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
*5.2.3	<b>6 sleeper / slaper:</b> Total cost / <i>totale koste</i> ✓RT ✓RT $= R2\ 640 + R2\ 730 \times 2$ ✓MA $= R8\ 100$ ✓CA VALID/ <i>GELDIG</i> ✓O	<b>CA from 5.2.2</b> 1RT correct rate, Thursday 1RT correct rate, weekend 1MA multiplying with 2 1CA simplification 1O conclusion (5)	M/F L4 M
5.3.1 (a)	✓A False, the map shows other roads also have toll gates. ✓O <i>Onwaar, die kaart toon ook ander tolhekke</i>	1A correct option 1O reason (2)	MP L4 E
5.3.1 (b)	True/ <i>Waar</i> ✓✓A	2A correct option (2)	MP L4 E
5.3.2	✓✓O Top view <b>or</b> aerial view <b>or</b> bird's eye view <b>or</b> satellite view <i>Bo-aansig of vanuit die lug aansig of voël-aansig of satelliet aansig.</i>	2O correct view (2)	MP L1 E
5.3.3	Distance/ <i>Afstand</i> = speed/ <i>spoed</i> × time/ <i>tyd</i> $588\text{ km} = \text{speed}/\text{spoed} \times 7\text{ h}$ ✓SF $\text{Speed}/\text{spoed} = \frac{588\text{ km}}{7\text{ h}}$ ✓A $= 84\text{ km/h}$ ✓CA	1SF substitution 1A change subject of formula 1CA simplification (3)	M L2 M
*5.3.4	Expense for tolls / <i>Tol-fooie</i> : ✓RT $= R56,00 + R77,00 + R82,00 + R58,00$ $= R273$ ✓CA Fuel used/ <i>Brandstof verbruik</i> $= 588\text{ km} \div 100\text{ km} \times 6,42\text{ l}$ ✓MA $= 37,7496\text{ l}$ ✓A Fuel cost / <i>Brandstofkoste</i> = $37,7497 \times R21,40$ $= R807,84$ ✓CA Total cost / <i>Totale koste</i> $= R8\ 100 + R807,84 \times 2 + R273,00 \times 2$ ✓MCA $= R10\ 261,68$ ✓CA Cost per person / <i>Koste per persoon</i> $= R10\ 261,68 \div 5$ ✓MCA $= R2\ 052,34$ ✓CA	<b>CA from 5.2.3</b> 1 RT correct 4 tolls 1CA simplification 1MA fuel consumption rate 1A simplification 1CA fuel cost 1MCA return trip 1CA total cost for 3 items 1MCA dividing by 5 1CA simplification	M/F L3 D

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L
	<p align="center"><b>OR/OF</b></p> <p>Round trip/ <i>Heer en terug</i> <math>588 \text{ km} \times 2 = 1176 \text{ km}</math>  Fuel used/<i>Brandstof verbruik</i>  <math>= 1176 \text{ km} \div 100 \text{ km} \times 6,42 \text{ ℓ}</math> ✓MA  <math>= 75,4992 \text{ ℓ}</math> ✓A</p> <p>Fuel cost / <i>Brandstofkoste</i> <math>= 75,4992 \times R21,40</math>  <math>= R1\,615,68</math> ✓CA</p> <p>Cost per person/<i>Koste per persoon</i>  <math>= R1\,615,68 \div 5</math> ✓MA  <math>= R323,14</math></p> <p>Toll fees / <i>Tol-fooie</i>:  <math>= R56,00 + R77,00 + R82,00 + R58,00</math> ✓RT  <math>= R273</math> ✓CA</p> <p>Round trip/ <i>Heen en weer</i>  <math>= R273 \times 2</math> ✓MCA  <math>= R546</math></p> <p>Cost per person/<i>Koste per persoon</i>  <math>= R546 \div 5</math>  <math>= R109,20</math></p> <p>Accommodation per person/<i>Verblyf per persoon</i>  <math>= R8100 \div 5</math>  <math>= R1\,620</math></p> <p>Total per person/ <i>Totaal per persoon</i>  <math>= R323,14 + R109,20 + R1\,620</math> ✓MCA  <math>= R2\,052,34</math> ✓CA</p> <p align="center"><b>OR/OF</b></p> <p>Toll Expenses / <i>Tol-fooie</i>:  ✓MCA ✓RT  <math>= 2(R56,00 + R77,00 + R82,00 + R58,00)</math>  <math>= R546,00</math> ✓CA</p> <p>Fuel Cost /<i>Brandstof koste</i></p> <p>Total Distance/<i>Afstand</i> <math>= 588 \text{ km} \times 2 = 1176 \text{ km}</math>  ✓MA ✓A</p> <p>Fuel used/<i>Brandstof</i>: <math>\frac{1176}{100} \times 6,42 = 75,4992 \text{ ℓ}</math></p> <p>Cost/<i>Koste</i>: <math>75,4992 \times R21,40 = R1\,615,68</math> ✓CA</p> <p>Total Cost/<i>Totale koste</i>:  <math>R8\,100 + R546,00 + R1\,615,68 = R10\,261,68</math> ✓CA</p> <p>Cost PP/ <i>Koste PP</i>: <math>R10\,261,68 \div 5 = R2\,052,34</math> ✓MCA ✓CA</p>	<p>1MA fuel consumption rate 1A simplification</p> <p>1CA fuel cost</p> <p>1MA dividing by 5</p> <p>1 RT correct 4 tolls 1CA simplification</p> <p>1MCA return trip</p> <p>1MCA adding all the values 1CA total cost</p> <p align="center"><b>OR/OF</b></p> <p>1MCA return trip 1 RT correct 4 tolls 1CA simplification</p> <p>1MA fuel consumption rate 1A simplification</p> <p>1CA fuel cost</p> <p>1CA total cost for 3 items</p> <p>1MCA dividing by 5 1CA simplification</p> <p align="right">(9)</p>	
		<b>[37]</b>	
		<b>TOTAL/TOTAAL: 150</b>	