



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE NASIONALE SENIOR SERTIFIKAAT

GRADE/GRAAD 12

**MATHEMATICAL LITERACY P2/
WISKUNDIGE GELETTERDHEID V2**

NOVEMBER 2019

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 150



Symbol/Kode	Explanation/Verduideliking
M	Method/ <i>Metode</i>
MA	Method with accuracy/ <i>Metode met 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/ <i>Opinie/Verduideliking</i>
P	Penalty, e.g. for no units, incorrect rounding off, etc./ <i>Penaliesie, bv. vir geen eenhede/verkeerde afronding, ens.</i>
R	Rounding off/ <i>Afronding</i>
NPR	No penalty for rounding/ <i>Geen penaliesie vir afronding nie</i>
AO	Answer only/ <i>Slegs antwoord</i>
MCA	Method with consistent accuracy/ <i>Metode met volgehoue akkuraatheid</i>

**These marking guidelines consist of 19 pages.
Hierdie nasienriglyne bestaan uit 19 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 guideline; however it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for each 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.


LET WEL:

- As 'n kandidaat 'n vraag TWEE KEER beantwoord, merk slegs die EERSTE poging.
- As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, merk die doodgetrekte (gekanselleerde) poging.
- Volgehoue akkuraatheid (CA) word in ALLE aspekte van die nasienriglyne toegepas, dit hou op by die tweede berekeningsfout.
- Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart geneem en ekstra antwoorde gee, penaliseer vir elke ekstra item.
- 'n Algemene merkbeginsel is dat indien 'n kandidaat een fout maak en daarna voortgaan met korrekte wiskunde, dat die kandidaat slegs een punt verloor.

QUESTION/VRAAG 1 [39 MARKS/PUNTE]			
Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
1.1.1	$\checkmark A$ $\checkmark A$ Bothaville and/en Viljoenskroon.	1A Bothaville 1A Viljoenskroon (2)	MP L2
1.1.2	$\checkmark\checkmark A$ $\checkmark\checkmark A$ South West and South. Suidwes en Suid	2A SW 2A S (any order) (4)	MP L2
1.1.3	Bloemfontein Welkom NAMPO $= 152 \text{ km} + 75 \text{ km} = 227 \text{ km}$ $\checkmark A$ Bloemfontein Bultfontein NAMPO $= 100 \text{ km} + 120 \text{ km} = 220 \text{ km}$ $\checkmark A$ \therefore via Bultfontein. $\checkmark O$ <p style="text-align: center;">OR/OF</p> Bloemfontein – Welkom – NAMPO $220 \text{ km} - 75 \text{ km} = 145 \text{ km}$ $\checkmark A$ Bloemfontein – Bultfontein – NAMPO $220 \text{ km} - 120 \text{ km} = 100 \text{ km}$ $\checkmark A$ \therefore via Bultfontein $\checkmark O$	1A correct value 1A correct value 1O conclusion <p style="text-align: center;">OR/OF</p> 1A correct value 1A correct value 1O conclusion	MP L4


Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Bultfontein to/tot NAMPO = 120 km ✓A Bloemfontein to/tot Bultfontein = 100 km ✓A 120 km + 100 km = 220 km ✓A</p> <p style="text-align: center;">OR/OF</p> <p>Bloemfontein to/tot NAMPO = 220 km ✓A 220 km – 100km to/tot Bultfontein = 120 km ✓A 120 km is the distance to NAMPO ✓A 120 km is die afstand tot by NAMPO</p> <p style="text-align: center;">OR/OF</p> <p>Bloemfontein to/tot NAMPO = 220 km ✓A Bultfontein to/tot NAMPO = 120 km ✓A Bloemfontein to/tot Bultfontein = 220 km – 120 km = 100 km ✓A</p> <p style="text-align: center;">OR/OF</p> <p>Nampo Park to/tot Bothaville = 15 km Bothaville to/tot Bultfontein = 105 km ✓A ∴ Nampo Park to/tot Bloemfontein = 15 km + 105 km + 100 km = 220 km ✓A</p>	<p style="text-align: center;">OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p>	(3)
1.1.4	<p>Distance/Afstand = speed/spoed × time/tyd</p> <p>150 km = 88 km/h × time/tyd ✓SF</p> <p>Time/Tyd = $\frac{150}{88}$ h ✓S = 1,7045... = 1h 42 min ✓C</p> <p>Arrival time/Aankomstyd = 18:45 + 1h42 min ✓M = 20:27 ✓CA</p> <p>NOT CORRECT ✓O NIE KORREK nie</p>	<p>1SF correct values into formula 1S changing subject of formula</p> <p>1C conversion</p> <p>1M adding</p> <p>1CA arrival time 1O verification</p>	M L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p style="text-align: center;">✓M ✓A ✓C</p> <p>From 18:45 to 20:00 is 1 hour 15 min = 1,25 hour <i>Van 18:45 tot 20:00 is 1 uur 15 min = 1,25 uur</i></p> <p>Distance/ = speed × time <i>Afstand = 88 km/h × 1,25h ✓SF</i> = 110 km ✓S</p> <p style="text-align: center;">✓O</p> <p>His timing is not correct, he is not yet in Sasolburg <i>Sy tydsberekening is nie reg nie, hy is nog nie in Sasolburg nie.</i></p> <p style="text-align: center;">OR/OF</p> <p style="text-align: center;">✓M ✓A ✓C</p> <p>From 18:45 to 20:00 is 1 hour 15 min = 1,25 hour <i>Van 18:45 tot 20:00 is 1 uur 15 min = 1,25 uur</i></p> <p>Distance = speed × time <i>Afstand = spoed × tyd</i> 150 km = speed × 1,25h ✓SF</p> <p>Speed/spoed = $\frac{150}{1,25}$ km/h ✓S = 120 km/h</p> <p style="text-align: center;">✓O</p> <p>He is wrong, he will have to drive faster to get to Sasolburg on time. <i>Hy is verkeerd, hy sal vinniger moet ry om betyds in Sasolburg te kom</i></p> <p style="text-align: center;">OR/OF</p> <p>Distance/Afstand = speed/spoed × time/tyd 150 km = 88 km/h × time/tyd ✓SF</p> <p>Time/Tyd = $\frac{150}{88}$ h ✓S = 1,7045... = 1h 42 min ✓C</p> <p style="text-align: center;">✓MA ✓A</p> <p>From 18:45 to 20:00 is 1 hour 15 min = 1,25 hour <i>Van 18:45 tot 20:00 is 1 uur 15 min = 1,25 uur</i> INCORRECT/NIE KORREK NIE ✓O</p>	<p style="text-align: center;">OR/OF</p> <p>1M subtracting time 1A elapsed time 1C conversion</p> <p>1SF into correct formula 1S simplification</p> <p>1O verification</p> <p style="text-align: center;">OR/OF</p> <p>1M subtracting time 1A elapsed time 1C conversion</p> <p>1SF into correct formula</p> <p>1S changing subject of formula</p> <p>1O verification</p> <p style="text-align: center;">OR/OF</p> <p>1SF into correct formula</p> <p>1S changing the subject of the formula</p> <p>1C conversion</p> <p>1MA subtracting 1A elapsed time 1O verification</p>	<p>(6)</p>

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
1.2.1	<p>Volume of a rectangular prism = length × width × height <i>Volume van n reghoekige prisma</i> = lengte × breedte × hoogte</p> <p>= $300 \text{ cm} \times 68,5 \text{ cm} \times 40 \text{ cm}$ ✓SF</p> <p>= $822\,000 \text{ cm}^3$ ✓A or/of 822 ℓ</p> <p>Capacity/<i>Kapasiteit</i> = $485 \text{ ℓ} = 485\,000 \text{ cm}^3$ ✓C</p> <p>Volume of the concrete (in cm^3) <i>Volume van die beton (in cm^3)</i> = $822\,000 - 485\,000$ ✓MA</p> <p>= $337\,000$ ✓CA</p>	<p>1C m to cm 1C mm to cm 1SF substitution</p> <p>1A volume</p> <p>1C conversion</p> <p>1MA subtracting capacity</p> <p>1CA concrete volume</p> <p>(7)</p>	M L3
1.2.2	<p>Number of cows/<i>aantal koeie</i> = $\frac{485}{56}$ ✓MA = 8,66 ✓A</p> <p>CORRECT /<i>KORREK</i> ✓O</p> <p>OR/OF </p> <p>Volume = $56 \text{ ℓ} \times 8$ ✓MA = 448 ℓ ✓A</p> <p>CORRECT /<i>KORREK</i> ✓O</p> <p>OR/OF</p> <p>Volume per cows/<i>per koei</i> = $\frac{485 \text{ ℓ}}{8}$ ✓MA = $60,625 \text{ ℓ}$ ✓A</p> <p>CORRECT /<i>KORREK</i> ✓O</p> <p>OR/OF</p> <p>$56 \times 8 \times 1000 \text{ cm}^3$ ✓MA = $448\,000 \text{ cm}^3$ ✓A</p> <p>CORRECT /<i>KORREK</i> ✓O</p>	<p>1MA dividing by 56</p> <p>1A simplification</p> <p>1O conclusion</p> <p>OR/OF</p> <p>1MA multiplying by 8</p> <p>1A simplification</p> <p>1O verification</p> <p>OR/OF</p> <p>1MA division by 8</p> <p>1A simplification</p> <p>1O verification</p> <p>OR/OF</p> <p>1MA multiplying by 8; 1 000</p> <p>1A simplification</p> <p>1O verification</p> <p>(3)</p>	M L4
1.2.3	<p>Volume = $\frac{485}{2} = 242,5 \text{ ℓ}$ ✓MA</p> <p>Time/<i>Tyd</i> = $\frac{242,5 \text{ ℓ}}{14,5 \text{ ℓ/min}}$ ✓MA = 16,724... ≈ 17 min ✓R</p>	<p>1MA dividing by 2</p> <p>1MA dividing by rate</p> <p>1R time</p>	M L2

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Time to fill / <i>Tyd om vol te maak</i></p> $= 485 \ell \div 14,5 \ell/\text{min} \quad \checkmark\text{MA}$ $= 33,44827586 \text{ min}$ <p>Time for half empty/ <i>Tyd vir half leeg</i></p> $= 33,44827586 \text{ min} \div 2 \quad \checkmark\text{MA}$ $= 16,72413793$ $\approx 17 \quad \checkmark\text{R}$	<p style="text-align: center;">OR/OF</p> <p>1 MA dividing by rate</p> <p>1MA dividing by 2</p> <p>1R time</p> <p style="text-align: right;">(3)</p>	
1.3.1	9,2 m $\checkmark\checkmark\text{A}$	2A estimated distance [accept answers in the range 9,0 m to 9,5m]	MP L2
1.3.2	<p>Measured distance/<i>Gemete afstand</i> = 174 mm $\checkmark\text{A}$ Distance from stand 10 to 17 = $4,5 \times 7 + 5 = 36,5 \text{ m}$ $\checkmark\text{A}$ <i>Afstand vanaf stalletjie 10 tot 17</i> = $4,5 \times 7 + 5 = 36,5 \text{ m}$ Scale/<i>Skaal</i></p> <p>174 mm : 36,5 m $\checkmark\text{M}$ = 174 mm : 36 500 mm $\approx 1 : 209,8 \quad \checkmark\text{CA}$</p> <p style="text-align: center;">OR/OF</p> <p>Measured distance/<i>Gemete afstand</i> = 174 mm $\checkmark\text{A}$ Distance from stand 10 to 17 = $4,5 \times 7 + 5 = 36,5 \text{ m}$ $\checkmark\text{A}$ <i>Afstand vanaf stalletjie 10 tot 17</i> = $4,5 \times 7 + 5 = 36,5 \text{ m}$ Scale/<i>Skaal</i></p> <p>17,4 cm = 36,5 m 1 cm = 2,0977011...m $\checkmark\text{M}$ $\therefore 1 \text{ cm} = 2,1 \text{ m} \quad \checkmark\text{CA}$</p>	<p>1A measurement (as per province) 1A distance</p> <p>1M concept of scale</p> <p>1CA simplified scale</p> <p style="text-align: center;">OR/OF</p> <p>1A measurement (as per province) 1A distance</p> <p>1M concept of scale 1CA simplified scale [accept measured answers in the range $\pm 2 \text{ mm}$ from province measurement]</p> <p style="text-align: right;">(4)</p>	MP L3
1.3.3	<p>$4 \text{ m} \times 4 \text{ m} = 16 \text{ m}^2$ is R22 942. $\therefore 1 \text{ m}^2 = \frac{22\,942}{16} = \text{R}1\,433,88$</p> <p>Area stand 26/<i>Opp van stalletjie 26</i> $= 4 \text{ m} \times 4,5 \text{ m} = 18 \text{ m}^2$</p> <p>Cost/<i>Koste</i> = $\text{R}1\,433,88 \times 18 \text{ m}^2 \quad \checkmark\text{M}$ $= \text{R}25\,809,84 \quad \checkmark\text{CA}$ $\therefore \text{NOT VALID /NIE GELDIG nie} \quad \checkmark\text{O}$</p>	<p>1MA unit price</p> <p>1RT dimensions of stand 26</p> <p>1M multiply by 18</p> <p>1CA simplification</p> <p>1O conclusion</p>	F L4

QUESTION/VRAAG 2 [38 MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
2.1.1	<p>Mean/Gemiddelde = $\frac{R287\,240\,000\,000}{148\,266}$ ✓C ✓MA = R1 937 328,855 per year/per jaar</p> <p>Monthly mean = R1 937 328,855 ÷ 12 ✓MA Maandelikse gemid. = R161 444,07 ✓CA</p> <p>INCORRECT / NIE KORREK nie ✓O</p> <p style="text-align: center;">OR/OF</p> <p>Mean/Gemid. = $\frac{287\,240\,000\,000}{148\,266}$ ✓C ✓MA = R1 937 328,855 per year/per jaar</p> <p>Then: R161 000 × 12 = R1 932 000 per year/per jaar ✓MA ✓CA INCORRECT / NIE KORREK nie ✓O</p> <p style="text-align: center;">OR/OF</p> <p>Total monthly income of millionaires Totale maandelikse inkomste = 161 000 × 148 266 ✓MA = R23 870 826 000</p> <p>Total annual income/ Totale jaarlikse inkomste = R23 870 826 000 × 12 ✓MA = R286 449 912 000 ✓CA ✓C</p> <p>Total taxable annual income is R287,24 billion Totale belasbare inkomste is R287,24 miljard INCORRECT / NIE KORREK nie ✓O</p> <p style="text-align: center;">OR/OF</p> <p>Income per year per person/ Jaarlikse inkomste per persoon = R161 000 × 12 ✓MA</p> <p>Total income per year /Totale jaarlikse inkomste = R1 932 000 × 148 266 ✓MA ✓CA = R286 449 912 000 = R286,449912 billion /miljard ≠ R287,24 billion/miljard ✓C INCORRECT / NIE KORREK nie ✓O</p> <p style="text-align: center;">OR/OF</p> <p>Income per year per person/ Jaarlikse inkomste per persoon = R0,161 million × 12 ✓MA Total income/Totale inkomste = R1,932 mil × 148 266 ✓MA = R286 449,912 mil ✓CA = R286,449912 billion/miljard ✓C ≠ R287,24 billion/miljard INCORRECT /NIE KORREK nie ✓O</p>	<p>1C billion to rand 1MA dividing by 148 266</p> <p>1MA dividing by 12 1CA monthly income</p> <p>1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1C billion to rand 1MA dividing by 148 266</p> <p>1MA multiply by 12 1CA yearly income 1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1MA multiply by 148 266</p> <p>1MA multiply by 12 1CA yearly income 1C billion to rand</p> <p>1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1MA multiply by 12</p> <p>1MA multiply by 148 266 1CA yearly income 1C billion to rand</p> <p>1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1MA multiply by 12</p> <p>1MA multiply by 148 266 1CA yearly income 1C billion to rand 1O conclusion</p>	D L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T/L
	<p style="text-align: center;">OR/OF</p> <p>Income per year per person/ <i>Jaarlikse inkomste per persoon</i> $\checkmark C$ = R0,000161 billion/<i>miljard</i> $\times 12$ $\checkmark MA$ Total income /<i>totale inkomste</i> = R0,001932 billion/ <i>miljard</i> $\times 148\ 266$ $\checkmark MA$ = R286,449912 billion /<i>miljard</i> $\checkmark CA$ \neq R287,24 billion/<i>miljard</i> INCORRECT/ <i>NIE KORREK nie</i> $\checkmark O$</p>	<p style="text-align: center;">OR/OF</p> <p>1C billion to rand 1MA multiply by 12 1MA multiply by 148 266 1CA yearly income 1O conclusion</p>	(5)
2.1.2	<p>Number/<i>Getal</i> = $148\ 266 \times \frac{100}{105,0065} = \frac{148\ 266}{1,050065}$ $\checkmark MA$ $\checkmark A$ = 141 196,97 \approx 141 196 or 141 197 $\checkmark CA$</p>	<p>1MA dividing 1A 105,0065% 1CA simplification</p>	D L3 (3)
2.2.1	<p>Medical scheme tax rebate/<i>Mediese- skema belasting krediet</i> $\checkmark RT$ = $R310 \times 2 \times 12$ $\checkmark MA$ = R7 440 $\checkmark CA$</p>	<p>1RT correct value 1MA multiplying 1CA simplification AO</p>	F L2 (3)
2.2.2	<p>Tax payable/<i>Belasting betaalbaar</i>  $\checkmark A$ $\checkmark A$ $\checkmark SF$ = $R532\ 041 + 45\% (R2\ 045\ 364 - R1\ 500\ 000)$ = R777 454,80 $\checkmark S$</p> <p>Tax after rebate/<i>Belasting na korting</i> $\checkmark M$ $\checkmark MA$ = $R777\ 454,80 - R14\ 067 - R7\ 713$ = R755 674,80</p> <p>Tax payable/<i>Belasting betaalbaar</i> = $R755\ 674,80 - R7\ 440$ $\checkmark MCA$ = R748 234,80 $\checkmark CA$</p>	<p>CA from Q2.2.1</p> <p>1A correct tax bracket 1A for 2 045 364 1SF correct substitution 1S simplification 1M subtracting rebates 1MA both correct values 1MCA subtracting MST rebate 1CA tax</p>	F L3 (8)
2.3.1	<p>Earning/ <i>Verdiens</i>te in Euro = $\frac{600\ 000}{7,47}$ $\checkmark MA$ $\checkmark A$ = 80 321,28514 $\checkmark A$</p> <p>Earning/<i>Verdiens</i>te in rand = $80\ 321,28514 \times 15,64$ $\checkmark MCA$ $\checkmark CA$ = R1 256 224,90</p>	<p>1MA dividing by euro 1A simplification 1MCA multiplying 1CA value</p>	F L3


Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Conversion ratio/Herleidingsverhouding</p> $= \frac{15,64}{7,47} \overset{\checkmark MA}{=} 2,093708166 \overset{\checkmark A}{} $ <p>Earning/Verdien = Kr600 000 × 2,093708166 $\overset{\checkmark M}{}$ = R1 256 224,90 $\overset{\checkmark CA}{}$</p> <p style="text-align: center;">OR/OF</p> <p>R15,64 = Kr7,47 $\overset{\checkmark M}{}$ R2,0937... = Kr1 $\overset{\checkmark A}{}$ \therefore Kr600 000 × R2,0937... $\overset{\checkmark M}{}$ = R1 256 224,90 $\overset{\checkmark CA}{}$</p>	<p style="text-align: center;">OR/OF</p> <p>1MA dividing by euro 1A simplification</p> <p>1M multiplying 1CA simplification</p> <p style="text-align: center;">OR/OF</p> <p>1M equation the rates 1A unit ratio 1M multiplying 1CA simplification</p> <p style="text-align: right;">(4)</p>	
2.3.2	<p>Total deductions/totale aftrekkings = Kr229 760 + Kr48 000 + Kr37 200r = Kr314 960 $\overset{\checkmark A}{}$</p> <p>Percentage/Persentasie = $\frac{Kr314960}{Kr600000} \times 100\% \overset{\checkmark M}{}$ $\approx 52,49\% \overset{\checkmark CA}{}$</p> <p>VALID/ GELDIG $\overset{\checkmark O}{}$</p> <p style="text-align: center;">OR/OF</p> <p>Total deductions/totale aftrekkings = Kr48 000 + Kr37 200 + Kr229 760 = Kr314 960 $\overset{\checkmark A}{}$</p> <p>Amount/bedrag = Kr600 000 × 52% $\overset{\checkmark M}{}$ = Kr312 000 $\overset{\checkmark CA}{}$</p> <p>VALID/ GELDIG $\overset{\checkmark O}{}$</p> <p style="text-align: center;">OR/OF</p> <p>220 760 + 48 000 + 37 200 = 314 960 To Euro = 314 960 ÷ 7,47 = €42 163,32 To rand = €42 163,32 × R15,64 = R659 434,32 $\overset{\checkmark A}{}$</p> <p>Percentage/ Persentasie = $\frac{R659\,434,32}{R1\,256\,224,98} \times 100\% \overset{\checkmark M}{}$ = 52,493% = 52% $\overset{\checkmark CA}{}$</p> <p>VALID/ GELDIG $\overset{\checkmark O}{}$</p>	<p>1A total deductions 1M percentage calculation</p> <p>1CA simplification 1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1A total deductions 1M percentage calculation 1CA simplification</p> <p>1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1A total deductions 1M percentage calculation</p> <p>1CA simplification 1O conclusion</p> <p style="text-align: right;">(4)</p>	F L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
2.4.1	United States of America ✓✓A Verenigde State van Amerika	2A correct country (2)	D L2
2.4.2	$P = \frac{2}{23}$ ✓A = 0,08695652174 ≈ 0,087 ✓R	1A numerator 1A denominator 1R correct form (3)	P L2
2.4.3 (a)	Q2 = 40 ✓✓A	2A median (2)	D L2
2.4.3 (b)	Q1 = 33 ✓A Q3 = 45 ✓A IQR = 45 – 33 ✓MCA = 12 CORRECT/KORREK ✓O	1A quartile 1 1A quartile 3 1MCA IQR with at least one correct value 1O verification (4)	D L4
			[38]



QUESTION/VRAAG 3 [35 MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
3.1.1	$\text{Rate per h/Tarief per uur} = \frac{\overset{\checkmark}{\text{MA}} \text{R31 050}}{\overset{\checkmark}{\text{M}} 18} = \text{R1 725/h}$ $\text{Rate /Tarief per min} = \frac{\overset{\checkmark}{\text{M}} \text{R1 725}}{60} = \overset{\checkmark}{\text{CA}} \text{R28,75/min}$ <p style="text-align: center;">OR/OF</p> $\text{Rate per 18 hours/Tarief per 18 uur}$ $= \frac{\text{R31 050}}{60} = \text{R517,50 / 18 h} \quad \checkmark \text{MA}$ $\text{Rate /Tarief per min} = \frac{\text{R517,50}}{18} \quad \checkmark \text{M}$ $= \text{R28,75/min} \quad \checkmark \text{CA}$ <p style="text-align: center;">OR/OF</p> $18 \text{ hours /uur} \times 60 = 1\,080 \text{ minutes/ minute} \quad \checkmark \text{MA}$ $\text{Solo rate/ alleenvlug tarief} = \frac{\overset{\checkmark}{\text{M}} \text{31 050}}{1\,080} = \overset{\checkmark}{\text{CA}} \text{R28,75/min}$	1MA dividing by 18 1M dividing by 60 1CA rate <p style="text-align: center;">OR/OF</p> 1MA dividing by 60 1M dividing by 18 1CA rate <p style="text-align: center;">OR/OF</p> 1MA conversion to minutes 1M dividing by 1 080 1CA rate AO (3)	F L2
3.1.2	Cost/Koste $= 28 \times \overset{\checkmark}{\text{MA}} \text{R2 050} + \overset{\checkmark}{\text{MA}} \text{R31 050} + \frac{15}{3} \times \overset{\checkmark}{\text{MA}} \text{R1 242} + \text{R700} + \text{R6 544} + 7 \times \overset{\checkmark}{\text{MA}} \text{R190}$ $= \overset{\checkmark}{\text{M}} \text{R57 400} + \text{R31 050} + \text{R6 210} + \overset{\checkmark}{\text{M}} \text{R700} + \text{R6 544} + \text{R1 330}$ $= \overset{\checkmark}{\text{CA}} \text{R103 234}$	1MA multiplying cost by hours 1MA theory lesson cost 1MA number of exams by cost 1M adding ALL values 1CA simplification (5)	F L3
3.2	$\text{Interest 1}^{\text{st}} \text{ year/Rente 1}^{\text{ste}} \text{ jaar} = \overset{\checkmark}{\text{MA}} \text{R90 000} \times 8,5\%$ $= \overset{\checkmark}{\text{A}} \text{R7 650}$ $\text{Balance year 1/Balans jaar 1} = \text{R90 000} + \text{R7 650}$ $= \overset{\checkmark}{\text{CA}} \text{R97 650}$ $\text{Interest 2}^{\text{nd}} \text{ year/Rente 2}^{\text{de}} \text{ jaar} = \text{R97 650} \times 8,5\%$ $= \overset{\checkmark}{\text{CA}} \text{R8 300,25}$ $\text{Balance at end of 2}^{\text{nd}} \text{ year/Balans teen einde 2}^{\text{de}} \text{ jaar}$ $= \text{R97 650} + \text{R8 300,25}$ $= \overset{\checkmark}{\text{CA}} \text{R105 950,25}$ <p>The amount is ENOUGH/Die bedrag is <i>GENOEG</i> $\checkmark \text{O}$</p>	1MA multiplying by the % 1A 1 st year interest 1CA 1 st year balance 1CA 2 nd year interest 1CA 2 nd year balance 1O conclusion CA from 3.1.2	F L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>The amount is increasing by 108,5% ✓ ✓ MA <i>Die bedrag verhoog met 108,5%</i></p> <p>Balance at the end of the second year <i>Balans aan die einde van die 2de jaar</i> ✓ MA ✓ MA = R90 000 × 108,5% × 108,5% = R105 950,25 ✓ CA</p> <p>The amount is ENOUGH/<i>Die bedrag is GENOEG</i> ✓ O</p>	<p>OR/OF</p> <p>2MA percentage increase</p> <p>1MA multiplying for 1st year 1MA multiplying for 2nd year 1CA simplification</p> <p>1O conclusion CA from 3.1.2 (6)</p>	
3.3.1	<p>Students study more after failing/ more serious about their work. ✓ ✓ O <i>Studente leer harder nadat hulle gedruip het/ hulle is ernstiger oor hul werk.</i></p> <p>OR/OF They have seen what the tests look like and prepare better for following tests/ gained experience. ✓ ✓ O <i>Hulle het gesien hoe die toetse lyk en berei hul beter voor vir opeenvolgende toets/ ondervinding opgedoen.</i></p> <p>OR/OF They have more time to prepare/ more practice/ attended extra classes. ✓ ✓ O <i>Hulle het meer tyd om voor te berei/ meer oefening/ woon ekstra lesse by.</i></p>	<p>2O reason</p> <p style="text-align: right;">(2)</p>	D L4
3.3.2	<p>24 is 20% A is 80% ✓ MA $\therefore A = 24 \times 4 = 96$ ✓ A</p> <p>20% of/van B = 24 $B = \frac{24}{20\%} = 120$ ✓ CA <i>or/of</i> $B = 96 + 24 = 120$</p> <p>C = A = 96 ✓ CA</p> <p>D = 96 – 67 = 29 ✓ CA <i>or/of</i> $D = 30\% \times 96 = 28,8 \approx 29$</p> <p>Total that passed <i>Totaal wat deurgekom het</i> = 24 + 29 = 53 ✓ CA</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Or/of $24 \div 20\% = 120$ $A = 120 - 24 = 96$</p> </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Or/of $67 \div 70\% = 95,7 \approx 96$ $D = 96 - 67 = 29$</p> </div>	<p>1MA multiplying by 4</p> <p>1A value of A</p> <p>1CA value of B</p> <p>1CA value of C [accept 95]</p> <p>1CA value of D [accept 28]</p> <p>1CA total [accept 52]</p>	D L3

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L	
	<p>OR/OF</p> $A = \frac{80\%}{20\%} \times 24 \quad \checkmark \text{MA}$ $= 96 \quad \checkmark \text{A}$ $B = \frac{100\%}{20\%} \times 24$ $= 120 \quad \checkmark \text{CA}$ $C = \frac{100\%}{70\%} \times 67 = 95,71 \approx 96 \quad \checkmark \text{CA}$ $D = \frac{30\%}{70\%} \times 67 = 28,71 \approx 29 \quad \checkmark \text{CA}$ <p>Total that passed / Totaal wat deurgekom het = 24 + 29 = 53 $\checkmark \text{CA}$</p>	<p>Or/of</p> $A: 20\% = 24$ $1\% = \frac{24}{20\%} = 1,2 \quad \checkmark \text{MA}$ $80 \times 1,2 = 96 \quad \checkmark \text{A}$	<p>OR/OF</p> <p>1MA multiplying by 4</p> <p>1A value of A</p> <p>1CA value of B</p> <p>1CA value of C [accept 95]</p> <p>1CA value of D [accept 28]</p> <p>1CA total NPR [accept 52]</p> <p>(6)</p>	
3.4	<p>Number of Days/Aantal dae $\checkmark \text{M}$ = 26 000 ÷ 24 = 1083,333...</p> <p>Number of hours/aantal ure = 0,333... × 24 = 8 $\checkmark \text{CA}$</p> <p>Number of weeks/aantal weke  $\checkmark \text{M}$ = 1083 ÷ 7 = 154,7142857...</p> <p>Number of days/Aantal dae = 0,71428... × 7 = 5 $\checkmark \text{CA}$</p> <p>154 weeks/weke 5 days/dae 8 hours/uur</p> <p>VALID/ GELDIG $\checkmark \text{O}$</p> <p>OR/OF</p> <p>Hours per week /Uur per week $\checkmark \text{M}$ = 24 × 7 = 168</p> <p>Weeks / Weke = $\frac{26\,000}{168} = 154,7619047619$</p> <p>Days/Dae = 0,7619047619 weeks/ weke × 7 = 5,333... days/dae = 5 $\checkmark \text{CA}$</p> <p>Hours/Uur = 0,333...days × 24 = 8 $\checkmark \text{M}$</p> <p><input type="checkbox"/> 154 weeks 5 days 8 hours $\checkmark \text{CA}$</p> <p>VALID/ GELDIG $\checkmark \text{O}$</p>	<p>1M dividing by 24</p> <p>1CA hours</p> <p>1M dividing by 7</p> <p>1CA simplification</p> <p>1O verification</p> <p>OR/OF</p> <p>1M multiply by 7</p> <p>1CA days</p> <p>1M multiply by 24</p> <p>1CA hours</p> <p>1O verification</p>	M L4	

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Days /Dae = $154 \times 7 = 1\ 078$ ✓ M Total days/ Totale dae = $1\ 078 + 5 = 1\ 083$ ✓ CA Hours/Uur = $1\ 083 \times 24 = 25\ 992$ ✓ M Total hours/ Totale ure = $25\ 992 + 8 = 26\ 000$ ✓ CA VALID/ GELDIG ✓ O</p> <p style="text-align: center;">OR/OF</p> <p>1 week = 7 days/dae = 7×24 h/uur = 168 hours/uur ✓ M Hours/Uur = $154 \times 168 = 25\ 872$ ✓ CA Hours/Uur = $5 \times 24 = 120$ ✓ M Total hours/Totale uur = $25\ 872 + 120 + 8 = 26\ 000$ ✓ CA VALID/ GELDIG ✓ O</p>	<p style="text-align: center;">OR/OF</p> <p>1M multiply by 7 1CA simplification 1M multiply by 24 1CA simplification 1O verification</p> <p style="text-align: center;">OR/OF</p> <p>1M multiply by 7 1CA simplification 1M multiply by 24 1CA simplification 1O verification</p> <p style="text-align: right;">(5)</p>	
3.5.1	33 ✓✓A	2A value (2)	MP L2
3.5.2	<p>Place seat face down. ✓✓A Keer die sitplek om op die grond. ✓✓A Attach the bench leg/s to the bench seat. ✓✓A Heg die bank se pote aan die banksitplek.</p> <p>Attach the long panel to bench leg/s. ✓✓A Voeg die langpaneel in tussen beide pote van die bank</p> <p style="text-align: center;">OR/OF</p> <p>Lift the bench leg, align dowels with hole on the bench seat and insert them. ✓✓A Lig die bank se pote, kry dit gelyk met die gate in die banksitplek en druk dit in.</p> <p>Insert the long panel./ Voeg lang paneel in. ✓✓A</p> <p style="text-align: center;">OR/OF</p> <p>Insert the dowels of the bench leg into the seat, ✓✓A Druk die tappe van die bank se pote in die sitplek.</p> <p>Connect the long panel with the bench leg. ✓✓A Verbind die langpaneel met die bank se pote.</p>	<p>2A first instruction</p> <p>2A second instruction</p> <p>[Any correct two]</p> <p style="text-align: right;">(4)</p>	MP L4
3.5.3	<p>It stabilises the bench/dit stabiliseer die bank. ✓✓O Keeps the bench sturdy/ steady/ strong/safe to sit on Dit hou die bank stewig /bestendig/sterk/veilig It prevents the bench from collapsing/dit keer dat die bank inmekaar val. It supports the bench legs/ondersteun die bank pote.</p>	<p>2O explanation</p> <p style="text-align: right;">(2)</p>	MP L4
		[35]	

QUESTION/VRAAG 4 [38 MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
4.1.1	<p>Percentage increase/<i>Persentasie verhoging</i></p> $= \frac{14,5 \text{ million} - 10,8 \text{ million}}{10,8 \text{ million}} \times 100\% \quad \checkmark M$ <p>$\approx 34,26\% \quad \checkmark CA$</p> <p style="text-align: center;">OR/OF</p> <p>Percentage increase/<i>Persentasie verhoging</i></p> $= \frac{14,5 \text{ million}}{10,8 \text{ million}} \times 100\% - 100\% \quad \checkmark M$ <p>$\approx 34,26\% \quad \checkmark CA$</p>	<p>1M subtracting values 1A denominator 1CA simplification</p> <p style="text-align: center;">OR/OF</p> <p>1A denominator 1M subtracting values 1CA simplification NPU (million and %)</p> <p style="text-align: right;">(3)</p>	D L2
4.1.2 (a)	Two/ <i>Twee</i> or/of 2 $\checkmark\checkmark A$	2A correct size (2)	D L2
4.1.2 (b)	Three/ <i>Drie</i> or/of 3 $\checkmark\checkmark A$	2A correct size (2)	D L2
4.1.3	<p>2001: Number of households/<i>Aantal huishoudings</i> $= 33\% \times 10,8 \text{ million} \quad \checkmark MA$ $= 3,564 \text{ million/miljoen} \quad \checkmark CA$</p> <p>2011: Number of households/<i>Aantal huishoudings</i> $= 25\% \times 14,5 \text{ million/miljoen} \quad \checkmark MA$ $= 3,625 \text{ million/miljoen} \quad \checkmark CA$</p> <p>Increase/<i>Toename</i> = 3,625 mil – 3,564 mil $= 0,061 \text{ million/miljoen}$</p> <p>$\therefore$ INCORRECT, $\checkmark O$ OR the number of households increased. \therefore <i>NIE KORREK nie,</i> <i>OF die aantal huishoudings het toeneem.</i></p>	<p>1MA percentage calculation 1CA simplification</p> <p>1MA percentage calculation 1CA simplification</p> <p>1O conclusion</p> <p style="text-align: right;">(5)</p>	D L4
4.1.4	<p style="text-align: right;">$\checkmark\checkmark O$</p> <p>Rounding factor or effect of rounding. Rounded-off the decimals. <i>Afrondingseffek. Die desimale plekke is afgerond.</i></p>	2O reason (2)	D L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
4.1.5	$P_{(\text{less than four})} / P_{(\text{minder as vier})}$ \checkmark RT $= 27\% + 19\% + 15\%$ \checkmark MA $= 61\%$ \checkmark CA	1RT correct values 1MA adding correct values 1CA simplification (3)	P L2
4.2.1	\checkmark RT R20 to/tot R79 \checkmark RT	2RT correct class (2)	D L2
4.2.2	\checkmark MA $5,4 \text{ mil} + 3,2 \text{ mil} = 8,6 \text{ mil}$ \checkmark CA	1 MA adding correct values 1CA number of households AO (2)	F L2
4.2.3	Total income/Totale inkomste = R817 500 \checkmark A Wong's household annual per capita Wong huishouding jaarliks per capita $= \frac{R817\,500}{3,5}$ \checkmark SF $= R233\,571,43$ \checkmark CA Wong's household daily per capita/daagliks per capita $= \frac{R233\,571,4285}{365}$ \checkmark MCA $= R639,92$ \checkmark CA <p style="text-align: center;">OR/OF</p> Total annual income/Totale jaarlikse inkomste $= R276\,000 + R541\,500 = R817\,500$ \checkmark A Wong's household daily income/daagliks per inkomste $= \frac{R817\,500}{365}$ \checkmark MCA or $\frac{R276\,000}{365} + \frac{R541\,500}{365}$ $\approx R2\,239,73$ \checkmark CA $= R756,16 + R1\,483,56$ $= R2\,239,72$	1A total income 1A family size 1SF substitution 1CA annual per capita 1MCA dividing annual per capita by 365 1CA daily per capita <p style="text-align: center;">OR/OF</p> 1A total household income 1MCA dividing by 365 1CA daily income	F L3
	Family size/Familie grootte = 1 + 1 + 1 + 0,5 = 3,5 \checkmark A Wong's household daily per capita Wong huishouding daaglikse per capita $= \frac{R2\,239,73}{3,5}$ \checkmark SF $= R639,92$ \checkmark CA	1A family size 1SF correct substitution 1CA daily per capita	

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Total income/<i>Totale inkomste</i> = R817 500 ✓ A Family size/<i>Familie grootte</i> = 1 + 1 + 1 + 0,5 = 3,5 ✓ A</p> <p>Wong's household daily per capita/<i>daaglik per capita</i> = $\frac{R817\,500}{365 \times 3,5}$ ✓ MCA ✓ A ✓ SF = R639,92 ✓ CA</p>	<p style="text-align: center;">OR/OF</p> <p>1A total household income 1A family size</p> <p>1A denominator 1MCA dividing by 365 1SF Substitution</p> <p>1CA daily per capita (6)</p>	
4.2.4	<p>Total per day/<i>Totaal per dag</i> = 4% × R280 = R11,20 ✓ A</p> <p>Total per year/<i>totaal per jaar</i> ✓ A = R11,20 × 365 = R4 088 ✓ CA</p> <p style="text-align: center;">OR/OF</p> <p>Rate per year/<i>Tarief per jaar</i> = R280 × 365 = R102 200 ✓ MCA Amount spent on cellphones/<i>Bedrag aan selfone gespandeer</i> = R102 200 × 4% ✓ A = R4 088 ✓ CA</p>	<p>1A daily value</p> <p>1A multiply by 365 1CA simplification</p> <p style="text-align: center;">OR/OF</p> <p>1MCA multiply by year consistent with Q4.2.3</p> <p>1A calculation 4% 1CA simplification AO (3)</p>	F L3
4.3.1	Neo. ✓✓ A	2O correct name (2)	D L4
4.3.2	<p>Elec/<i>Elek.</i> = R125 × 12,2 mil = R1 525 mil ✓ MA Water = R98 × 10,6 mil = R1 038,8 mil ✓ MA</p> <p>Monthly total in million / <i>Maandelikse total in miljoen</i> = R1 525 + R1 038,8 = R2 563,8 ✓ M</p> <p>Total spent on electricity and tap water in millions: <i>Totaal aan water en elektrisiteit gespandeer in miljoene:</i> = R2 563,8 × 12 = R30 765,6 ✓ CA</p>	<p>1MA electricity amount 1MA water amount</p> <p>1M adding amounts</p> <p>1CA simplification</p>	F L3

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Elec/<i>Elek</i> = R125 × 12,2 mil = R1 525 mil Total for the year / <i>Totaal vir die jaar</i> = R1 525 million/<i>miljoen</i> × 12 = R18 300 million/<i>miljoen</i> ✓ MA</p> <p>Water = R98 × 10,6 mil = R1 038,8 mil Total for the year / <i>Totaal vir die jaar</i> = R1 038,8 million/<i>miljoen</i> × 12 = R12 465,6 million/<i>miljoen</i> ✓ MA</p> <p>Total spent on electricity and tap water in millions: <i>Totaal aan water en elektrisiteit gespandeer in miljoene:</i> ✓ M = R18 300 + R12 465,6 = R30 765,6 ✓ CA</p> <p style="text-align: center;">OR/OF</p> <p>Annual cost for electricity / <i>Jaarlikse elektrisiteit koste</i> = R125 × 12 = R1 500 Total electricity / <i>Totaal elektrisiteit</i> = R1 500 × 12,2 million = R18 300 million/<i>miljoen</i> ✓ MA</p> <p>Annual cost for tap water / <i>Jaarlikse water koste</i> = R98 × 12 = R1 176 Total / <i>Totaal</i> :water = R1 176 × 10,6 million/<i>miljoen</i> = R12 465,6 million/<i>miljoen</i> ✓ MA</p> <p>Total spent on electricity and tap water <i>Totaal aan water en elektrisiteit gespandeer:</i> = R18 300 million + R12 465,6 million ✓ M = R30 765,6 million/<i>miljoen</i> = R30 765 600 000 ✓ CA</p>	<p style="text-align: center;">OR/OF</p> <p>1MA electricity amount</p> <p>1MA water amount</p> <p>1M adding amounts 1CA simplification</p> <p style="text-align: center;">OR/OF</p> <p>1MA electricity amount</p> <p>1MA water amount</p> <p>1M adding amounts 1CA simplification</p> <p style="text-align: right;">(4)</p>	
4.3.3	<p style="text-align: right;">✓✓ O</p> <p>The scale on the axis (vertical / y axis) of the two graphs differs. <i>Die skaal op die as (vertikale / y-as) verskil.</i></p> <p>The intervals on Graph A is 10% while Graph B is 40% <i>Die intervalle op Grafiek A is 10% terwyl Grafiek B 40% is</i></p>	<p>2O reason</p> <p style="text-align: right;">(2)</p>	D L4
		[38]	
TOTAL/TOTAAL: 150			