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

**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. <i>Suidwes en Suid</i>	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. $\checkmark O$ OR/OF 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 OR/OF 1A correct value 1A correct value 1O conclusion	MP L4

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
	<p>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>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>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>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>OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p> <p>OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p> <p>OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p> <p>OR/OF</p> <p>1A correct value 1A correct value 1A conclusion</p> <p>(3)</p>	
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</i> ✓SF = 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/<i>Afstand</i> = speed/<i>spoed</i> × time/<i>tyd</i> 150 km = 88 km/h × time/<i>tyd</i> ✓SF</p> <p>Time/<i>Tyd</i> = $\frac{150}{88}$ 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>	(6)

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
1.2.1	<p>Volume of a rectangular prism = length \times width \times height <i>Volume van 'n reghoekige prisma</i> = lengte \times breedte \times 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/Kapasiteit = $485 \text{ ℓ} = 485\,000 \text{ cm}^3$ ✓C</p> <p>Volume of the concrete (in cm^3) <i>Volume van die beton (in cm^3)</i> = $822\,000 - 485\,000$ ✓MA = $337\,000$ ✓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 1CA concrete volume</p> <p>(7)</p>	M L3
1.2.2	<p>Number of cows/aantal koeie = $\frac{485}{56}$ ✓MA = 8,66 ✓A CORRECT /KORREK ✓O</p> <p>OR/OF</p> <p>Volume = $56 \text{ ℓ} \times 8$ ✓MA = 448 ℓ ✓A CORRECT /KORREK ✓O</p> <p>OR/OF</p> <p>Volume per cows/per koei = $\frac{485 \text{ ℓ}}{8}$ ✓MA = $60,625 \text{ ℓ}$ ✓A CORRECT /KORREK ✓O</p> <p>OR/OF</p> <p>$56 \times 8 \times 1000 \text{ cm}^3$ ✓MA = $448\,000 \text{ cm}^3$ ✓A CORRECT /KORREK ✓O</p>	<p>1MA dividing by 56 1A simplification 1O conclusion</p> <p>OR/OF</p> <p>1MA multiplying by 8 1A simplification 1O verification</p> <p>OR/OF</p> <p>1MA division by 8 1A simplification 1O verification</p> <p>OR/OF</p> <p>1MA multiplying by 8; 1 000 1A simplification 1O verification</p> <p>(3)</p>	M L4
1.2.3	<p>Volume = $\frac{485}{2} = 242,5 \text{ ℓ}$ ✓MA</p> <p>Time/Tyd = $\frac{242,5 \text{ ℓ}}{14,5 \text{ ℓ/min}}$ ✓MA = 16,724... $\approx 17 \text{ min}$ ✓R</p>	<p>1MA dividing by 2</p> <p>1MA dividing by rate</p> <p>1R time</p>	M L2

Q/V	Solution/Oplossing	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 $\checkmark \checkmark \text{A}$	<p>2A estimated distance [accept answers in the range 9,0 m to 9,5m]</p> <p style="text-align: right;">(2)</p>	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 NOT VALID /<i>NIE GELDIG nie</i> $\checkmark \text{O}$</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

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Area stand 26/Opp van stalletjie 26 $= 4 \text{ m} \times 4,5 \text{ m} = 18 \text{ m}^2$ ✓RT</p> <p>Cost/Koste = $\frac{22\,942}{16} \times 18$ ✓M 16 ✓MA $= \text{R}25\,809,75$ ✓CA \therefore NOT VALID /NIE GELDIG nie ✓O</p> <p style="text-align: center;">OR/OF</p> <p>$4 \text{ m} \times 4 \text{ m} = 16 \text{ m}^2$ is R22 942 Stand/stalletjie 26 = $4 \text{ m} \times 4,5 \text{ m}$ ✓RT</p> <p>Cost of stand 26 /Koste vir stalletjie 26 $= \text{R}22\,942 \div 4 \times 4,5$ ✓MA ✓M $= \text{R}25\,809,75$ ✓CA \therefore NOT VALID /NIE GELDIG nie ✓O</p> <p style="text-align: center;">OR/OF</p> <p>$4 \text{ m} \times 4 \text{ m} = 16 \text{ m}^2$ is R22 942 $\therefore 1 \text{ m}^2 = \frac{22\,942}{16}$ $= \text{R}1\,433,88$ ✓MA $4 \text{ m} \times 4,5 \text{ m} = 18 \text{ m}^2$ ✓RT is R25 000 $\therefore 1 \text{ m}^2 = \frac{25\,000}{18}$ $= \text{R}1\,388,89$ ✓CA $\therefore \text{R}1\,433,88 \neq \text{R}1\,388,89$ \therefore NOT VALID /NIE GELDIG nie</p>	<p style="text-align: center;">OR/OF</p> <p>1RT dimensions of stand 26</p> <p>1MA divide by 16 1M multiply by 18</p> <p>1CA simplification 1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1RT dimensions of stand 26</p> <p>1MA divide by 4 1M multiply by 4,5 1CA simplification 1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1MA unit price 1RT dimensions of stand 26</p> <p>1M divide by 18 1CA simplification 1O conclusion NPR</p> <p style="text-align: right;">(5)</p>	
		[39]	

QUESTION/VRAAG 2 [38 MARKS/PUNTE]			
Q/V	Solution/Oplossing	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> $\checkmark C$ $= R0,000161 \text{ billion/miljard} \times 12 \checkmark MA$ Total income / <i>totale inkomste</i> $= R0,001932 \text{ billion/ miljard} \times 148\,266 \checkmark MA$ $= R286,449912 \text{ billion/ miljard} \checkmark CA$ $\neq R287,24 \text{ billion/miljard}$ 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 (5)</p>	
2.1.2	<p>Number/Getal = $148\,266 \times \frac{100}{105,0065} = \frac{148\,266}{1,050065} \checkmark MA$ $\checkmark A$ $= 141\,196,97$ $\approx 141\,196 \text{ or } 141\,197 \checkmark CA$</p>	<p>1MA dividing 1A 105,0065% 1CA simplification (3)</p>	D L3
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 (3)</p>	F L2
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 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 (8)</p>	F L3
2.3.1	<p>Earning/ <i>Verdienste</i> in Euro = $\frac{600\,000}{7,47} \checkmark MA$ $= 80\,321,28514 \checkmark A$</p> <p>Earning/ <i>Verdienste</i> in rand = $80\,321,28514 \times 15,64 \checkmark MCA$ $= R1\,256\,224,90 \checkmark CA$</p>	<p>1MA dividing by euro 1A simplification 1MCA multiplying 1CA value</p>	F L3

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Conversion ratio/<i>Herleidingsverhouding</i></p> $= \frac{15,64}{7,47} \checkmark \text{MA} = 2,093708166 \checkmark \text{A}$ <p>Earning/<i>Verdien</i> = Kr600 000 \times 2,093708166 $\checkmark \text{M}$ = R1 256 224,90 $\checkmark \text{CA}$</p> <p style="text-align: center;">OR/OF</p> <p>R15,64 = Kr7,47 $\checkmark \text{M}$ R2,0937... = Kr1 $\checkmark \text{A}$ \therefore Kr600 000 \times R2,0937... $\checkmark \text{M}$ = R1 256 224,90 $\checkmark \text{CA}$</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/<i>totale aftrekkings</i> = Kr229 760 + Kr48 000 + Kr37 200r = Kr314 960 $\checkmark \text{A}$</p> <p>Percentage/<i>Persentasie</i> = $\frac{\text{Kr314 960}}{\text{Kr600 000}} \times 100\%$ $\checkmark \text{M}$ $\approx 52,49\%$ $\checkmark \text{CA}$</p> <p>VALID/ <i>GELDIG</i> $\checkmark \text{O}$</p> <p style="text-align: center;">OR/OF</p> <p>Total deductions/<i>totale aftrekkings</i> = Kr48 000 + Kr37 200 + Kr229 760 = Kr314 960 $\checkmark \text{A}$</p> <p>Amount/<i>bedrag</i> = Kr600 000 \times 52% $\checkmark \text{M}$ = Kr312 000 $\checkmark \text{CA}$</p> <p>VALID/ <i>GELDIG</i> $\checkmark \text{O}$</p> <p style="text-align: center;">OR/OF</p> <p>220 760 + 48 000 + 37 200 = 314 960 To Euro = 314 960 \div 7,47 = €42 163,32 To rand = €42 163,32 \times R15,64 = R659 434,32 $\checkmark \text{A}$</p> <p>Percentage/ <i>Persentasie</i> = $\frac{\text{R659 434,32}}{\text{R1 256 224,98}} \times 100\%$ $\checkmark \text{M}$ = 52,493% = 52% $\checkmark \text{CA}$</p> <p>VALID/ <i>GELDIG</i> $\checkmark \text{O}$</p>	<p>1A total deductions 1M percentage calculation 1CA simplification 1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1A total deductions 1M percentage calculation 1CA simplification 1O conclusion</p> <p style="text-align: center;">OR/OF</p> <p>1A total deductions 1M percentage calculation 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	$\text{Rate per h/Tarief per uur} = \frac{\overset{\checkmark}{\text{MA}} \text{ R31 050}}{\overset{\checkmark}{\text{M}} 18} = \text{R1 725/h}$ $\text{Rate /Tarief per min} = \frac{\text{R1 725}}{60} = \text{R28,75/min} \quad \checkmark \text{CA}$ <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> $18 \text{ hours /uur} \times 60 = 1\,080 \text{ minutes/ minute} \quad \checkmark \text{MA}$ $\text{Solo rate/ alleenvlug tarief} = \frac{\overset{\checkmark}{\text{M}} \text{ 31 050}}{1\,080} = \text{R28,75/min} \quad \checkmark \text{CA}$	<p>1MA dividing by 18</p> <p>1M dividing by 60 1CA rate</p> <p style="text-align: center;">OR/OF</p> <p>1MA dividing by 60</p> <p>1M dividing by 18 1CA rate</p> <p style="text-align: center;">OR/OF</p> <p>1MA conversion to minutes</p> <p>1M dividing by 1 080 1CA rate AO</p> <p style="text-align: right;">(3)</p>	F L2
3.1.2	$\text{Cost/Koste} = 28 \times \overset{\checkmark}{\text{MA}} \text{ R2 050} + \overset{\checkmark}{\text{MA}} \text{ R31 050} + \frac{15}{3} \times \overset{\checkmark}{\text{MA}} \text{ R1 242} + \text{R700} + \text{R6 544} + 7 \times \overset{\checkmark}{\text{MA}} \text{ R190}$ $= \text{R57 400} + \text{R31 050} + \overset{\checkmark}{\text{M}} \text{ R6 210} + \text{R700} + \text{R6 544} + \text{R1 330}$ $= \text{R103 234} \quad \checkmark \text{CA}$	<p>1MA multiplying cost by hours</p> <p>1MA theory lesson cost</p> <p>1MA number of exams by cost</p> <p>1M adding ALL values</p> <p>1CA simplification</p> <p style="text-align: right;">(5)</p>	F L3
3.2	$\text{Interest 1}^{\text{st}} \text{ year/Rente 1}^{\text{ste}} \text{ jaar} = \text{R90 000} \times \overset{\checkmark}{\text{MA}} 8,5\% = \text{R7 650} \quad \checkmark \text{A}$ $\text{Balance year 1/Balans jaar 1} = \text{R90 000} + \text{R7 650} = \text{R97 650} \quad \checkmark \text{CA}$ $\text{Interest 2}^{\text{nd}} \text{ year/Rente 2}^{\text{de}} \text{ jaar} = \text{R97 650} \times 8,5\% = \text{R8 300,25} \quad \checkmark \text{CA}$ $\text{Balance at end of 2}^{\text{nd}} \text{ year/Balans teen einde 2}^{\text{de}} \text{ jaar} = \text{R97 650} + \text{R8 300,25} = \text{R105 950,25} \quad \checkmark \text{CA}$ <p>The amount is ENOUGH/Die bedrag is <i>GENOEG</i> $\checkmark \text{O}$</p>	<p>1MA multiplying by the % 1A 1st year interest</p> <p>1CA 1st year balance</p> <p>1CA 2nd year interest</p> <p>1CA 2nd year balance</p> <p>1O conclusion CA from 3.1.2</p>	F L4

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
	<p>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 $= R90\,000 \times 108,5\% \times 108,5\%$ $= R105\,950,25$ ✓ 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>(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 $D = 96 - 67 = 29$ ✓ 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; margin-top: 10px;"> <p>Or/of $67 \div 70\% = 95,7 \approx 96$ $D = 96 - 67 = 29$</p> </div>	<p>1MA multiplying by 4 1A value of A</p> <p>1CA value of B</p> <p>1CA value of C [accept 95] 1CA value of D [accept 28]</p> <p>1CA total [accept 52]</p>	D L3

Q/V	Solution/Oplossing	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> <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</p> $= 26\,000 \div 24 = 1083,333\ldots \quad \checkmark \text{M}$ <p>Number of hours/aantal ure = $0,333\ldots \times 24 = 8 \quad \checkmark \text{CA}$</p> <p>Number of weeks/aantal weke</p> $= 1083 \div 7 = 154,7142857\ldots \quad \checkmark \text{M}$ <p>Number of days/Aantal dae = $0,71428\ldots \times 7 = 5 \quad \checkmark \text{CA}$</p> <p>154 weeks/weke 5 days/dae 8 hours/uur</p> <p>VALID/ GELDIG $\checkmark \text{O}$</p> <p>OR/OF</p> $\text{Hours per week /Uur per week} = 24 \times 7 = 168 \quad \checkmark \text{M}$ $\text{Weeks / Weke} = \frac{26\,000}{168} = 154,7619047619$ $\text{Days/Dae} = 0,7619047619 \text{ weeks/ weke} \times 7$ $= 5,333\ldots \text{ days/dae} = 5 \quad \checkmark \text{CA}$ $\text{Hours/Uur} = 0,333\ldots \text{ days} \times 24 = 8 \quad \checkmark \text{M}$ <p>\square 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 <i>Keer die sitplek om op die grond.</i> Attach the bench leg/s to the bench seat. <i>Heg die bank se pote aan die banksitplek.</i></p> <p>Attach the long panel to bench leg/s. ✓✓A <i>Voeg die langpaneel in tussen beide pote van die bank</i></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 <i>Lig die bank se pote, kry dit gelyk met die gate in die banksitplek en druk dit in.</i></p> <p>Insert the long panel./ <i>Voeg lang paneel in.</i> ✓✓A</p> <p style="text-align: center;">OR/OF</p> <p>Insert the dowels of the bench leg into the seat, ✓✓A <i>Druk die tappe van die bank se pote in die sitplek.</i></p> <p>Connect the long panel with the bench leg. ✓✓A <i>Verbind die langpaneel met die bank se pote.</i></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 <i>Dit hou die bank stewig /bestendig/sterk/veilig</i> 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/Oplossing	Explanation/Verduideliking	T&L
4.1.1	<p>Percentage increase/<i>Persentasie verhoging</i></p> $= \frac{14,5 \text{ million} - 10,8 \text{ million}}{10,8 \text{ million}} \times 100\% \quad \checkmark M$ $\approx 34,26\% \quad \checkmark CA$ <p style="text-align: center;">OR/OF</p> <p>Percentage increase/<i>Persentasie verhoging</i></p> $= \frac{14,5 \text{ million}}{10,8 \text{ million}} \times 100\% - 100\% \quad \checkmark M$ $\approx 34,26\% \quad \checkmark CA$	<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> = $33\% \times 10,8 \text{ million}$ $\checkmark MA$ = 3,564 million/<i>miljoen</i> $\checkmark CA$</p> <p>2011: Number of households/<i>Aantal huishoudings</i> = $25\% \times 14,5 \text{ million}$ $\checkmark MA$ = 3,625 million/<i>miljoen</i> $\checkmark CA$</p> <p>Increase/<i>Toename</i> = 3,625 mil – 3,564 mil = 0,061 million/<i>miljoen</i></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: center;">$\checkmark\checkmark O$</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 mil + 3,2 mil = 8,6 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 OR/OF 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 $\frac{R276\,000}{365} + \frac{R541\,500}{365}$ $= R756,16 + R1\,483,56$ $= R2\,239,72$ $\approx R2\,239,73$ \checkmark CA 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 total income 1A family size 1SF substitution 1CA annual per capita 1MCA dividing annual per capita by 365 1CA daily per capita OR/OF 1A total household income 1MCA dividing by 365 1CA daily income 1A family size 1SF correct substitution 1CA daily per capita	F L3

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>daaglikse 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> = 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/Oplossing	Explanation/Verduideliking	T&L
	<p style="text-align: center;">OR/OF</p> <p>Elec/<i>Elek</i> = $R125 \times 12,2 \text{ mil} = R1\,525 \text{ mil}$ Total for the year / <i>Totaal vir die jaar</i> = $R1\,525 \text{ million/miljoen} \times 12$ = $R18\,300 \text{ million/miljoen}$ ✓ MA</p> <p>Water = $R98 \times 10,6 \text{ mil} = R1\,038,8 \text{ mil}$ Total for the year / <i>Totaal vir die jaar</i> = $R1\,038,8 \text{ million/miljoen} \times 12$ = $R12\,465,6 \text{ million/miljoen}$ ✓ 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> = $R125 \times 12 = R1\,500$ Total electricity / <i>Totaal elektrisiteit</i> = $R1\,500 \times 12,2 \text{ million} = R18\,300 \text{ million/miljoen}$ ✓ MA Annual cost for tap water/ <i>Jaarlikse water koste</i> = $R98 \times 12 = R1\,176$ Total / <i>Totaal</i> :water = $R1\,176 \times 10,6 \text{ million/miljoen}$ = $R12\,465,6 \text{ million/miljoen}$ ✓ MA</p> <p>Total spent on electricity and tap water <i>Totaal aan water en elektrisiteit gespandeer:</i> = $R18\,300 \text{ million} + R12\,465,6 \text{ million}$ ✓ M = $R30\,765,6 \text{ million/miljoen} = R30\,765\,600\,000$ ✓ 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 intervale 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			