



# basic education

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

## **NATIONAL SENIOR CERTIFICATE NASIONALE SENIOR SETIFIKAAT**

**GRADE/GRAAD 12**

**MATHEMATICAL LITERACY P2/  
WISKUNDIGE GELETTEDHEID V2**

**NOVEMBER 2018**

**MARKING GUIDELINES/NASIENRIGLYNE**

**MARKS/PUNTE: 150**

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

**This marking guideline consists of 17 pages.  
Hierdie nasien riglyne bestaan uit 17 bladsye.**

<b>APPROVED ON 6 November 2018</b>	<b>External Moderators</b>	
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**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.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra incorrect item presented.

**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 nasienriglynetoegepas, 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 verkeerde item.

<b>QUESTION/VRAAG 1 [38 MARKS/PUNTE]</b>			
<b>Q/V</b>	<b>Solution/Oplissing</b>	<b>Explanation/Verduideliking</b>	<b>T&amp;L</b>
1.1.1	Discount percentage/Persentasie afslag $= \frac{R6140}{R160\,087,72} \times 100\%$ <p style="text-align: center;">✓ RT</p> <p style="text-align: right;">✓ MA</p> $= 3,835397... \approx 3,8\%$ <p style="text-align: right;">✓ A</p>	1RT numerator and denominator 1MA multiply correct values with 100 % 1A simplification rounded to one decimal place <b>AO</b> (3)	F L2
1.1.2	Sub Total/Subtotaal $= R160\,087,72 - R6\,140 + (2 \times R3\,500 + R4\,298,25 + R1\,315,79)$ $= R166\,561,76$ <p style="text-align: center;">✓ M                      ✓ RT                      ✓ MA</p>	1M subtracting discount 1RT all values 1MA adding accessories, on roads & transaction fee (3)	F L2
1.1.3	Safety reason/as a safety feature - protect against thieves / hijackers /sunlight / door against damages <i>Veiligheidsrede/as 'n veiligheidskenmerk - beskerm teen die we / kapers / sonlig / deur teen beskadiging</i>  <b>OR/OF</b> Beautification of the car / reduce sunlight <i>Verfraaiing van die motor/ sonlig te verminder</i>  <b>OR/OF</b> Longer lasting /Langdurend  <b>OR/OF</b> Convenience / Gemak  <b>OR/OF</b> For insurance purposes / Vir versekeringsdoeleindes	2O reason	F L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
1.1.4	<p>Interest Year 1/ <i>Jaar1 rente</i>  <math>= 6\% \times R\ 1\ 250\ 000 = R\ 75\ 000</math> ✓ MA</p> <p>Interest Year 2/ <i>Jaar2 rente</i>  <math>= 6\% \times (R\ 1\ 250\ 000 + R\ 75\ 000) = R\ 79\ 500</math> ✓ CA</p> <p>Interest rate 3 Months /<i>Rentekoers vir 3 maande</i> ✓ C  <math>= 6\% \div 4 = 1,5\%</math> or <math>6\% \times \frac{3}{12} = 1,5\%</math> ✓ M</p> <p>Interest 3 Months/<i>3 Maande rente</i>  <math>= 1,5\% \times (R\ 1\ 325\ 000 + R\ 79\ 500) = R\ 21\ 067,50</math> ✓ CA</p> <p>Interest earned/ <i>Rente verdien</i>  <math>= R\ 75\ 000 + R\ 79\ 500 + R\ 21\ 067,50 = R\ 175\ 567,50</math> ✓ CA</p> <p>Interest earned is not enough / not sufficient to cover the price of the <i>bakkie</i>. ✓ O  <i>Die rente verdien is nie genoeg om die aankoopprys te dek nie</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>27 months = 2 years and 3 months or <math>2\frac{1}{4}</math> years  <i>27 maande = 2 jaar en 3 maande of <math>2\frac{1}{4}</math> jaar</i> ✓ C</p> <p>1st year value/<i>Iste jaar waarde</i>  <math>= R\ 1\ 250\ 000 \times 6\% + R\ 1\ 250\ 000 = R\ 1\ 325\ 000</math> ✓ MA ✓ CA</p> <p>2<sup>nd</sup> year value/<i>2de jaar waarde</i>  <math>= R\ 1\ 325\ 000 \times 6\% + R\ 1\ 325\ 000 = R\ 1\ 404\ 500</math> ✓ CA</p> <p>Last 3 months/<i>Laaste 3 maande</i>  <math>= R\ 1\ 404\ 500 \times \frac{6\%}{4} + R\ 1\ 404\ 500 = R\ 1\ 425\ 567,50</math> ✓ M ✓ CA</p> <p>Difference/<i>Verskil</i>  <math>= R\ 1\ 425\ 567,50 - R\ 1\ 250\ 000 = R\ 175\ 567,50</math> ✓ MA ✓ CA</p> <p>It is not enough / not sufficient / <i>Dit is nie genoeg nie.</i> ✓ O</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Value the interest after 27 months/ <i>Rentewaarde na 27 maande</i>  <math>= R\ 1\ 250\ 000 \times 1,06 \times 1,06 \times 1,015 - R\ 1\ 250\ 000</math> ✓ M ✓ M ✓ CA ✓ C  <math>= R\ 1\ 425\ 567,50 - R\ 1\ 250\ 000</math> ✓ MA  <math>= R\ 175\ 567,50</math> ✓ CA</p> <p>Not enough / not sufficient / <i>Nie genoeg nie.</i> ✓ O</p>	<p>1MA calculating interest</p> <p>1CA 1<sup>st</sup> year value  1CA 2<sup>nd</sup> year interest  1C conversion to years (allocated since there are 3 periods)  1M dividing % value by 4 (or the interest by 4)</p> <p>1CA last 3 months interest</p> <p>1M adding the interest values  1CA available amount</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR /OF</b></p> <p>1C conversion to years</p> <p>1MA calculating interest  1CA 1<sup>st</sup> year value</p> <p>1CA 2<sup>nd</sup> year value</p> <p>1M dividing % value by 4  1CA last 3 months value</p> <p>1MA subtracting  1CA available amount</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>2M multiply the principal with 106 %  1M 2<sup>nd</sup> year value  2CA 3months rate and value  1C conversion to years  1MA subtracting  1CA available amount  1O conclusion (9)</p>	<p>F L3</p>

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
1.1.5	<p style="text-align: right;">✓ O</p> <p>Mistake: calc. 14% on original price AND an extra 1% on accumulated price  <i>Fout: bereken 14% op die oorspronklike EN tel 'n ekstra 1% by die totaal.</i></p> <p>Correct calculation should be 15% on original price  <i>Korrekte berekening sou wees om 15% by oorspronklike prys te tel</i></p> <p>New selling price / Nuwe verkoopsprys            = R160 087,72 + 15% of R160 087,72 ✓ MA            = R160 087,72 + R24 013,16 ✓ MA            = R184 100,88 ✓ CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>The dealer added 1% on the VAT inclusive price of ✓ O            R182 500 / Calculating VAT on VAT  <i>Die handelaar het 1% by die BTW insluitende prys van R182 500 getel/ Bereken BTW op BTW</i></p> <p>He should have calculated the 15% directly on the original selling price excluding VAT.  <i>Hy moet die 15% direk op die oorspronklike verkoopsprys sonder BTW tel</i></p> <p>New selling price incl. VAT/ Verkoopsprys BTW ingesluit            ✓ A            = 115% × R160 087,72 ✓ MA            = R184 100,88 ✓ CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Mistake is calculating the increased 1% on the VAT inculsive amount. ✓ O            The 1% must be added to the original price  <i>Die fout wat hy gemaak het is om die 1% op die prys wat reeds BTW bevat uit te werk</i></p> <p>Increased price incl. VAT / Verhoogde prys met BTW            ✓ MA            = R182 500 + R160 087,72 × 1% ✓ MA            = R184 100,88 ✓ CA</p>	<p>1O reason</p> <p>1MA calculating 15%            1MA adding            1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1O stating the error or the solution</p> <p>1A 115%            1MA multiplying            1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1O describing the error</p> <p>1MA calculating 1% on original amount            1MA adding to VAT incl. amount            1CA simplification</p> <p style="text-align: right;">(4)</p>	<p>F L4</p>

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
1.2.1 (a)	<p>Surface area of an open box/<i>Buite opp. van oopboks</i> ✓ SF  <math>= \text{Width} \times \text{length} + 2(\text{length} \times \text{height} + \text{width} \times \text{height})</math> ✓ A  <math>= 1,374 \text{ m} \times 1,807 \text{ m} + 2(1,807 \text{ m} \times 0,535 \text{ m} + 1,374 \text{ m} \times 0,535 \text{ m})</math></p> <p><math>= 2,482818 \text{ m}^2 + 2(1,701835 \text{ m}^2)</math> ✓ S</p> <p><math>= 5,886488 \text{ m}^2</math> ✓ CA</p> <p>Surface area of bin (bakkie)/<i>Opp. van bak</i>  <math>= 5,886488 \text{ m}^2 + 2\% \times 5,886488 \text{ m}^2</math> ✓ MCA  <math>= 5,886488 \text{ m}^2 + 0,11772976 \text{ m}^2</math>  <math>= 6,00421776 \text{ m}^2</math> ✓ CA</p> <p><b>Or/of</b>  <math>= 1,02 \times 5,886488 \text{ m}^2</math>  <math>= 6,00421776 \text{ m}^2</math></p> <p>Number of litres required/<i>Aantal liter benodig</i>  <math>= \frac{6,00421776 \text{ m}^2}{0,25 \text{ m}^2/\ell}</math> ✓ MA</p> <p><math>= 24,01687104 \approx 25 \ell</math> ✓ R</p>	<p>1SF Substitution 1A correct values used</p> <p>1S simplification</p> <p>1CA total area</p> <p>1MCA increasing by 2%</p> <p>1CA simplification</p> <p>1MA dividing with spread rate</p> <p>1R rounding up litres</p> <p>(8)</p>	M L3
1.2.1 (b)	<p>Cost = Number of 5 litre <math>\times</math> 2 coats <math>\times</math> Price per 5 litre  <i>Koste = Aantal 5 liters <math>\times</math> 2 lae <math>\times</math> prys per 5ℓ</i>  <math>= \frac{25}{5} \times 2 \times R549,00</math> ✓ CA  <math>= R5 490,00</math> ✓ CA</p> <p><b>OR/OF</b></p> <p>For two coats of paint = <math>25 \times 2 = 50</math> litres ✓ MCA</p> <p>Number of 5 litre tins = <math>\frac{50}{5} = 10</math> ✓ CA</p> <p>Cost = <math>10 \times R5 49 = R5 490</math> ✓ CA</p>	<p>CA from 1.2.1(a)</p> <p>1CA number of 5 litres 1MCA multiply 2 by price</p> <p>1CA cost for 10 litres</p> <p><b>OR/OF</b></p> <p>1MCA multiply by 2</p> <p>1CA number of 5 litres</p> <p>1CA cost <b>AO</b></p> <p>(3)</p>	F L2

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
1.2.2	<p>To protect the cargo bin's surface from scratching/rusting/ being damaged. ✓✓ O <i>Om die vragbak te beskerm teen krappe/roes/beskadiging</i></p> <p style="text-align: center;"><b>OR</b></p> <p style="text-align: right;">✓✓ O</p> <p>Extend the life span of a bakkie's loading box <i>Om die vragbak se leeftyd te verleng</i></p> <p style="text-align: center;"><b>OR</b></p> <p style="text-align: right;">✓✓ O</p> <p>To stop goods from slipping/protection of goods/<i>Om te keer dat goedere gly/beskadig word.</i></p>	<p>20 reason</p> <p style="text-align: right;">(2)</p>	M L4
1.3	<p>Time: Apply = 20 min × 2 coats = 40 min Re-coat = 4 hours = 240 min ✓ C Drying time = 2 hours = 120 min <i>Tyd: Aanwend = 20 min × 2 lae = 40 min</i> <i>Wagtyd = 4 uur = 240 min</i> <i>Droogtyd = 2 uur = 120 min</i></p> <p>Total time needed/<i>totale tyd benodig</i> = 40 min + 240 min + 120 min = 400 min = 6 hours 40 min ✓ M ✓ CA</p> <p>Completion/<i>Voltooing</i> = 8 h 15 + 6 h 40 = 14 h 55 ∴ Time/<i>Tyd</i> 14:55 ✓ CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Apply 1<sup>st</sup> coat (20 min) 8:15 – 8:35 ✓ M <i>Wend 1<sup>ste</sup> laag aan (20 min) 8:15 – 8:35</i></p> <p>Waiting time (4 hours) 8:35 – 12:35 ✓ MCA <i>Wagtyd (4 uur) 8:35 – 12:35</i></p> <p>Apply 2<sup>nd</sup> coat (20 min) 12:35 – 12:55 ✓ MCA <i>Wend 2<sup>de</sup> laag aan (20 min) 12:35 – 12:55</i></p> <p>Drying time (2 hours) 12:55 – 14:55 <i>Droogtyd (2 uur) 12:55 – 14:55</i></p> <p>∴ Time 14:55 or 2:55 p.m. or five to three in the afternoon ✓ CA ∴ <i>Tyd 14:55 of 2:55 nm. of vyf minute voor drie die namiddag</i></p>	<p>1C converting</p> <p>1M adding times 1CA time needed</p> <p>1CA time</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1M adding times</p> <p>1MCA adding correct hours</p> <p>1MCA adding correct times</p> <p>1 CA time</p> <p><b>AO</b></p> <p style="text-align: right;">(4)</p>	M L2
			<b>[38]</b>

QUESTION/VRAAG 2 [38MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
2.1.1 (a)	$A = \frac{216\,329 - 227\,665}{227\,665} \times 100\%$ $= -4,979\%$ $\approx -5\%$	<p>1MA subtracting correct values 1A denominator 1A negative simplification</p> <p>1RCA value of A</p>	D L2
2.1.1 (b)	<p>-12 ; -5 ; -2 ; -1 ; 0 ; 2 ; 5 ; 10 ; 13 ; 13 ; 16 ; 18 ; 19 ; 40</p> $\text{Median/Mediaan} = \frac{5\% + 10\%}{2} = 7,5\%$	<p>CA from 2.1.1(a) 1MCA arranging 1M median concept 1CA median</p>	D L3
2.1.2	<p>As the year increased the value of the imports of make-up and skincare increased.</p> <p><i>Soos die jare aangaan, het die waarde van die invoere van grimering en versorg vermeerder.</i></p>	<p>1A year increased 1A value increased</p>	D L4
2.1.3	<p><b>Fr:</b> import share increased from 2013 to 2014, but decreased in 2015. <i>RW: invoer vermeerder in 2014 vanaf 2013, maar verminder in 2015</i></p> <p><b>Pf:</b> import share decreased from 2013 to 2014, but increased in 2015. <i>Pf: invoer verminder in 2014 vanaf 2013, maar vermeerder in 2015.</i></p>	<p>1A product 1O reasoning</p> <p>1A product 1O reasoning</p>	D L4
2.1.4	<p>No. Too many sectors and one pie chart cannot be used as different years need to be shown. <i>Nee. Teveel sektore om op een sirkeldiagram te toon omdat verskillende jare getoon moet word.</i></p> <p><b>OR/OF</b></p> <p>No. Too many sectors/columns; some are too small /negligible. <i>Nee. Te veel sektore/kolomme; sommige is te klein.</i></p> <p><b>OR/OF</b></p> <p>No. Negative values will be difficult to indicate. <i>Nee. Negatiewe waardes maak dit moeilik.</i></p> <p><b>OR/OF</b></p> <p>No. Percentages do not add up to 100%. <i>Nee. Persentasies tel nie op tot 100% nie.</i></p>	<p>1O No 1O reason</p>	D L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
2.1.5	<p style="text-align: center;"><b>Percentage imports and average growth of Personal Care and Cosmetics to Australia</b></p> <p style="text-align: center;"><b>Products</b></p> <p>1A first point                      1A last point                      3 × 1A Every other two points correctly plotted                      1A Joining</p>		D L3

(6)



Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
2.2.1	Total cost = Basefare + 10 × cost per mile <i>Totale koste = Basisfooi + 10 × koste per myl</i> $= \$20,00 + 10 \times \$5,00 \text{ per mile}$ $= \$70,00$	2RT using correct values 1CA value of B if only 1 value is incorrect (3)	F L2
2.2.2	Maximum distance (in miles)/ <i>Maksimum afstand(in myl)</i> $= \frac{\$4,65}{\$0,90}$ $= 5,166\dots$ $\approx 5$	1RT reading correct values from table 1M dividing 1CA simplification 1R rounding (4)	F L3
2.2.3	1 hour 9 minutes = 69 minutes <i>1 uur 9 minute = 69 minute</i> Post trip cost/ <i>Na-ritkoste</i> $= 69 \text{ min} \times \$0,45 / \text{min} + 29,73 \text{ mi} \times \$3,55 / \text{mi}$ $= \$31,05 + \$105,5415$ $= \$136,59$ Upfront cost/ <i>Vooruit koste</i> $= \$8 + 29,73 \text{ mi} \times \$3,55 / \text{mi}$ $= \$113,54$ Difference = \$136,59 – \$113,54 = \$23,05 The statement is correct/ <i>Die stelling is korrek.</i> <p style="text-align: center;"><b>OR/OF</b></p> Difference = Post trip cost – Upfront cost <i>Verskil = Na-ritkoste – Vooruit koste</i> $= 69 \text{ min} \times \$0,45 / \text{min} + 29,73 \text{ mi} \times \$3,55 / \text{mi} - (\$8 + 29,73 \text{ mi} \times \$3,55 / \text{mi})$ $= 69 \text{ min} \times \$0,45 / \text{min} - \$8$ $= \$23,05$ The statement is correct/ <i>Die stelling is korrek.</i>	1 C converting to minutes 1SF substituting correct values 1S simplification 1CA post trip cost 1SF substituting correct values 1CA upfront trip cost 1S difference 1O conclusion <p style="text-align: center;"><b>OR/OF</b></p> 1C time to minutes 1SF values into 1 <sup>st</sup> formula 1SF values into 2 <sup>nd</sup> formula 3S simplification 1CA difference 1O conclusion (8)	F L4

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
2.2.4	<p style="text-align: center;">✓✓ O</p> <p>To cover cost for idle/wasted time when a vehicle could have been used to assist someone when you cancel the booking.  <i>Om kostes te dek vir verlore tyd terwyl die voertuig gebruik kon word om iemand anders te help wanneer jy die bespreking kanselleer.</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Penalty for booking made if one does not finally use the vehicle (time wasting). ✓✓ O  <i>Boete vir'n bespreking wat gemaak is as jy aan die einde nie die voertuig gebruik nie (vermorsing van tyd)</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Prevent hoax calls/ Verhoed fopoproepe ✓✓ O</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>To cover petrol costs and wear and tear of the vehicle ✓✓ O  <i>Om petrol- en slytasieloste van die voertuig te dek.</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>For the company to make a profit / avoid losses ✓✓ O  <i>Vir die maatskappy om 'n wins te maak/ verhoed verliese</i></p>	<p style="text-align: center;">20 reasoning</p> <p style="text-align: right;">(2)</p>	<p>F L4</p>
		[38]	

QUESTION/VRAAG 3 [39MARKS/PUNTE]			
Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
3.1.1	$P_{(\text{Coke \& water})} = \left(\frac{4}{9}\right)^{\checkmark A}$ $= 0,44 \quad \checkmark CA$	1A numerator 1A denominator 1CA decimal number <b>NPR</b>	P L2
3.1.2	South East <b>OR</b> East of South <b>OR</b> SE. $\checkmark\checkmark A$ <i>Suidoos <b>OF</b> Oos van Suid <b>OF</b> SO</i>	2A direction	MP L2
3.1.3 (a)	The start is at 1 400 m $\checkmark A$ running to 1 565 m at the 5 km mark and then 1 708 m at the 10 km mark. $\checkmark A$ <i>Die begin is by 1 400m, by die 5km merk is dit 1 565 m en            dan 1 708 m by die 10km merk.</i>	1A for height 1 400 m 1 A for height 1 708 m  [Accept increase in height above sea level/altitude]	MP L4
3.1.3 (b)	Lowest point : highest point/ <i>Laagste punt: hoogste punt</i> $\checkmark RT \quad \checkmark RT$ $= 1\ 166\ m : 1\ 708\ m$ $= 1 : 1,464837... \quad \checkmark CA$ $\approx 1 : 1,46$ or $1 : 1,5$	2RT correct values  1CA ratio <b>NPR</b>	MP L2
3.1.4	To take struggling runners out of the race because they are not coping. $\checkmark\checkmark O$ <i>Om hardlopers wat sukkel uit die wedren te haal omdat hulle            nie die mas opkom nie.</i>  <b>OR</b>  Security reasons (guards and health personnel deployed in strategic sections along the race course during specific times). <i>Veiligheidsredes(wagte en noodhulppersoneel word ontplooi            in sekere gedeeltes van die wedren vir spesifieke tye)</i>  <b>OR/OF</b>  For runners to know whether they have a realistic chance of finishing race within the time allowed for the race. $\checkmark\checkmark O$ <i>Sodat deelnemers weet of hulle 'n realistiese kans het om die            wedren binne die toegelate tyd te voltooi.</i>  <b>OR/ OF</b>  Also helps organisers to plan appropriately for other scheduled events. $\checkmark\checkmark O$ <i>Dit help ook die organiseerders om te beplan vir ander            geskeduleerder items soos medalje- en perskonferensies.</i>  <b>OR/ OF</b>  If the road was closed it needs to be opened. $\checkmark\checkmark O$ <i>Indien die pad gesluit was, moet weer oopgestel word.</i>	2O understanding/reason	MP L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
3.1.5	<p>The average speed required to beat the cut-off 2:  <i>Die gemiddelde spoed nodig om afsny 2 te haal:</i></p> $\text{Speed/Spoed(marathon)} = \frac{31,5\text{km}}{5\text{h}15\text{min}} \quad \checkmark\text{RT}$ $= 6 \text{ km/h} \quad \checkmark\text{CA}$ $\text{Speed/Spoed}(1/2 \text{ marathon}) = \frac{16,5\text{km}}{5\text{h}} \quad \checkmark\text{MA}$ $= 3,3 \text{ km/h} \quad \checkmark\text{CA}$ <p><math>\checkmark\text{O}</math>  The claim is correct (<math>6 - 3,3 = 2,7 \text{ km/h}</math>).  <i>Die bewering is korrek.</i></p> <p style="text-align: center;"><b>OR/OF</b></p> $\text{Speed/Spoed}(1/2 \text{ marathon}) = 16,5 \text{ km} \div 5\text{h} = 3,3 \text{ km/h} \quad \checkmark\text{M}$ $\text{Increased speed for full marathon} = (3,3 + 2,7) \text{ km/h} = 6\text{km/h} \quad \checkmark\text{CA}$ $\text{Distance} = 6 \text{ km/h} \times 5,25\text{h} = 31,5 \text{ km} \quad \checkmark\text{MA}$ <p>Correct/<i>Korrek</i> <math>\checkmark\text{O}</math></p> <p style="text-align: center;"><b>OR/OF</b></p> $\text{Speed/Spoed}(1/2 \text{ marathon}) = 16,5 \text{ km} \div 5\text{h} = 3,3 \text{ km/h} \quad \checkmark\text{CA}$ $\text{Increased speed for full marathon} = (3,3 + 2,7) \text{ km/h} = 6\text{km/h} \quad \checkmark\text{MA}$ $\text{Time to cut-off} = \frac{31,5\text{km}}{6\text{km/h}} = 5,25 \text{ h} \quad \checkmark\text{MA}$ <p>Correct/<i>Korrek</i> <math>\checkmark\text{O}</math></p>	<p>1RT correct values (dist. &amp; time)  1M calculating speed / change the subject  1CA simplification</p> <p>1MA calculating speed</p> <p>1CA 2nd speed</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1M calculating speed / change the subject  1CA simplification  1MA calculating incr. speed  1MA calculating distance  1CA distance  1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1M calculating speed / change the subject  1CA simplification  1MA calculating incr. speed  1MA calculating time  1CA time  1O conclusion</p> <p style="text-align: right;">(6)</p>	<b>MP L4</b>
3.2.1	$20 \ell = 20 \times 1\,000 \text{ cm}^3 \quad \checkmark\text{C}$ <p>Inner diameter /<i>Binneste middellyn</i> = <math>31,2 \text{ cm} - 2 \times 0,2 \text{ cm}</math>  = <math>30,8 \text{ cm} \quad \checkmark\text{A}</math></p> $V = 3,142 \times (30,8\text{cm} \div 2)^2 \times \text{height/hoogte} \quad \checkmark\text{MCA}$ $20\,000 \text{ cm}^3 = 3,142 \times \left(\frac{30,8}{2} \text{ cm}\right)^2 \times \mathbf{H} \quad \checkmark\text{SF}$ $\mathbf{H} = \frac{20\,000 \text{ cm}^3}{3,142 \times 237,16\text{cm}^2} \quad \checkmark\text{M}$ $= \frac{20\,000}{745,15672} \text{ cm} \quad \checkmark\text{S}$ $= 26,84 \text{ cm} \quad \checkmark\text{CA}$	<p>1C conversion</p> <p>1A calculating inner diameter</p> <p>1MCA radius</p> <p>1SF correct values</p> <p>1M changing the subject</p> <p>1S simplification</p> <p>1CA height</p> <p style="text-align: right;">(7)</p>	<b>M L3</b>

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
3.2.2 (a)	<p>Area of base of 1 bucket/Oppervlakte van 1 emmer basis</p> $= 3,142 \times (15,6 \text{ cm})^2$ $= 764,63712 \text{ cm}^2 \quad \checkmark \text{ CA}$ <p>Area of base of 11 buckets/Oppervlakte van 11 emmers</p> $= 11 \times 764,63712 \text{ cm}^2 = 8\,411,00832 \text{ cm}^2 \quad \checkmark \text{ CA}$ <p>Area of base of pallet/Oppervlakte van palletbasis</p> $= 100 \text{ cm} \times 120 \text{ cm} = 12\,000 \text{ cm}^2 \quad \checkmark \text{ A}$ <p>Difference/Verskil = <math>12\,000 \text{ cm}^2 - 8\,411,00832 \text{ cm}^2</math></p> $= 3\,588,99168 \text{ cm}^2 \quad \checkmark \text{ CA}$	<p>1A radius</p> <p>1CA simplification</p> <p>1CA multiply by 11</p> <p>1SF correct values 1A rectangular area</p> <p>1CA area unused <b>NPR</b></p> <p>(6)</p>	M L3
3.2.2 (b)	$120 \text{ cm} = 31,2 \times 3 + C$ $C = 120 \text{ cm} - 31,2 \text{ cm} \times 3 \quad \checkmark \text{ M}$ $= 26,4 \text{ cm} \quad \checkmark \text{ CA}$	<p>1A 120 cm</p> <p>1M multiplying and subtracting 1CA finding C</p> <p>(3)</p>	M L4
3.2.3	<p>Length occupied by 4 buckets/Lengte van 4 emmerbasisse</p> $= 4 \times 31,2 \text{ cm} = 124,8 \text{ cm} \quad \checkmark \text{ MA} \quad \checkmark \text{ A}$ <p>Length should be increased by/Lengte moet vermeerder met</p> $= \frac{124,8 - 120}{120} \times 100\% \quad \checkmark \text{ CA} \quad \checkmark \text{ M}$ $= 4\% \quad \checkmark \text{ CA}$ <p style="text-align: center;"><b>OR/OF</b></p> <p>Length occupied by 4 buckets/Lengte van 4 emmerbasisse</p> $= 4 \times 31,2 \text{ cm} = 124,8 \text{ cm} \quad \checkmark \text{ MA} \quad \checkmark \text{ A}$ <p>120 cm is 100%</p> $124,8 \text{ cm is } \frac{124,8}{120} \times 100\% = 104\% \quad \checkmark \text{ M} \quad \checkmark \text{ CA}$ <p><math>\therefore</math> 4% increase <math>\checkmark \text{ CA}</math></p>	<p>1MA multiplying 1A correct length</p> <p>1CA substituting 1M % change</p> <p>1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1MA multiplying 1A correct length</p> <p>1M multiply with 100% 1CA simplification</p> <p>1CA simplification</p> <p>(5)</p>	MP L3
		[39]	

<b>QUESTION/VRAAG 4 [35 MARKS/PUNTE]</b>			
<b>Q/V</b>	<b>Solution/Oplissing</b>	<b>Explanation/Verduideliking</b>	<b>T&amp;L</b>
4.1.1	<p>Total for these capsules/<i>totaal vir hierdie kapsules</i></p> $= 23 \times \overset{\checkmark}{\text{MA}} \text{£}27 + 5 \times \overset{\checkmark}{\text{MA}} \text{£}27 \times 90\% + 8 \times \overset{\checkmark}{\text{MA}} \text{£}22 + 7 \times \overset{\checkmark}{\text{MA}} \text{£}25,50$ $= \text{£}621 + \text{£}121,50 + \text{£}176 + \text{£}178,50$ $= \text{£}1\,097 \quad \checkmark \text{CA}$ <p>Rand value/<i>waarde</i> = <math>\text{£}1\,097 \times \text{R}16,58/\text{£}</math></p> $= \text{R}18\,188,26 \quad \checkmark \text{C}$ <p><math>\therefore</math> the statement is not correct/<i>die opmerking is nie korrek nie</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Without discount for 5/<i>sonder afslag vir 5</i></p> $= 28 \times \overset{\checkmark}{\text{MA}} \text{£}27 + 8 \times \overset{\checkmark}{\text{MA}} \text{£}22 + 7 \times \overset{\checkmark}{\text{MA}} \text{£}25,50 \quad \checkmark \text{MA}$ $= \text{£}756 + \text{£}176 + \text{£}178,50$ $= \text{£}1\,110,50 \quad \checkmark \text{CA}$ <p>Discount for 5/<i>Afslag vir 5</i> = <math>5 \times \text{£}27 \times 10\%</math></p> $= \text{£}13,50 \quad \checkmark \text{A}$ <p>Total ticket price/<i>Totale kaartjie prys</i></p> $= \text{£}1\,110,50 - \text{£}13,50 = \text{£}1\,097 \quad \checkmark \text{CA}$ <p>Rand value/<i>waarde</i></p> $= \text{£}1\,097 \times \text{R}16,58/\text{£} = \text{R}18\,188,26 \quad \checkmark \text{C}$ <p>NOT correct/<i>NIE korrek NIE</i> <math>\checkmark \text{O}</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Cost of Capsule 24 + Cost of Capsule 30 – Discount for 5</p> <p>Adults</p> $(18 \times \overset{\checkmark}{\text{MA}} \text{£}27 + 7 \times \overset{\checkmark}{\text{MA}} \text{£}22 + 2 \times \overset{\checkmark}{\text{MA}} \text{£}25,50) + \overset{\checkmark}{\text{M}}$ $(10 \times \overset{\checkmark}{\text{MA}} \text{£}27 + 1 \times \overset{\checkmark}{\text{MA}} \text{£}22 + 5 \times \overset{\checkmark}{\text{MA}} \text{£}25,50) - 5 \times \overset{\checkmark}{\text{A}} \text{£}27 \times 10\% =$ $\text{£}691 + \text{£}419,5 - \overset{\checkmark}{\text{CA}} \text{£}13,5 = \text{£}1\,097 \quad \checkmark \text{CA}$ <p>Rand value/<i>waarde</i></p> $= \text{£}1\,097 \times \text{R}16,58/\text{£} = \text{R}18\,188,26 \quad \checkmark \text{C}$ <p>NOT correct/<i>NIE korrek NIE</i> <math>\checkmark \text{O}</math></p>	<p>3MA multiply tickets by price</p> <p>2MA discount for 5</p> <p>1CA total for 2 capsules</p> <p>1C pounds to rand</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>3MA multiply tickets by price</p> <p>1CA simplification</p> <p>1A discount</p> <p>1CA total</p> <p>1C pounds to rand</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>2MA multiply tickets by price</p> <p>1M adding costs</p> <p>1A discount</p> <p>1CA simplification</p> <p>1CA total</p> <p>1C pounds to rand</p> <p>1O conclusion</p>	F L4

Q/V	Solution/Oplissing	Explanation/Verduideliking	T&L
	<p style="text-align: center;"><b>OR/OF</b></p> <p>Ticket price in rand:            Adult: <math>27 \times 16,58 = R447,66</math>            Children: <math>22 \times 16,58 = R364,76</math>            Senior citizens: <math>25,5 \times 16,58 = R422,79</math></p> <p>Discount adult = <math>R44,77</math>            Online ticket price = <math>R402,89</math></p> <p>Total price = <math>(23 \times R447,66) + (5 \times R402,89) +</math>  <math>(8 \times R364,76) + (7 \times R422,79)</math>  <math>= R18\ 188,24</math></p> <p>NOT correct/NIE korrek NIE</p>	<p style="text-align: center;"><b>OR/OF</b></p> <p>1C conversion</p> <p>1A discount</p> <p>4×1MA multiply tickets by price</p> <p>1CA total</p> <p>1O conclusion</p> <p style="text-align: right;">(8)</p>	
4.1.2 (a)	<p>Circumference of the wheel/Omtrek van die wiel  <math>= 2 \times \pi \times \text{radius}</math>  <math>= 2 \times 3,142 \times 197</math>  <math>= 1\ 237,948 \text{ feet/voet}</math></p>	<p>1SF correct values</p> <p>1CA circumference  <b>NPR</b></p> <p style="text-align: right;">(2)</p>	M L2
4.1.2 (b)	<p>Distance/Afstand = <math>\frac{1\ 237,948}{32} \text{ feet/voet}</math>  <math>= 38,685875 \text{ feet/voet}</math>  <math>= \frac{38,685875}{3,28} \text{ m}</math>  <math>= 11,794\dots \text{m} \approx 11 \text{ m}</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Circumference in metre/Omtrek in meter  <math>= \frac{1\ 237,948}{3,28} = 377,4231707 \text{ m}</math>            Distance apart/afstand tussen kapsules  <math>= \frac{377,4231707}{32}</math>  <math>= 11,794\dots \text{m}</math>  <math>\approx 11 \text{ m}</math></p>	<p>CA from 4.1.2(a)            1MA dividing by 32</p> <p>1C conversion</p> <p>1R rounded distance            [also accept 12m]</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1C conversion</p> <p>1MA dividing by 32</p> <p>1R rounded distance</p> <p style="text-align: right;">(3)</p>	M L2
4.2.1	<p>Difference/Verskil = <math>624\ 000 - 312\ 600</math>  <math>= 311\ 400</math> or/of 311,4 thousand/duisend</p>	<p>1RT correct values            1M subtraction            1CA difference in <b>thousands</b></p> <p style="text-align: right;">(3)</p>	D L2

Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
4.2.2	$P(\text{Midlands West \& East}) = \frac{609\,600 + 295\,000}{7\,146\,600} \times 100\% \quad \checkmark \text{RT}$ $= \frac{904\,600}{7\,146\,600} \times 100\% \quad \checkmark \text{M}$ $= 12,65776\dots\%$ $\approx 12,66\% \quad \checkmark \text{CA}$	<p>1RT numerator &amp; denominator</p> <p>1S simplification 1M multiply by 100%</p> <p>1CA probability <b>NPR</b> <b>AO</b></p> <p>(4)</p>	P L3
4.2.3	$\text{Ratio/Verhouding} = \frac{1\,157,0}{378,3} \quad \checkmark \text{RT}$ $= 3,0584 \quad \checkmark \text{CA}$ <p>∴ The statement is valid/Die bewering is geldig. <math>\checkmark \text{O}</math></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Number of business visitors = 378,3 thousand And holiday visitors = 1 157 thousand</p> $378,3 \text{ thousand} \times 3 = 1\,134,9 \text{ thousand} \quad \checkmark \text{RT} \quad \checkmark \text{CA}$ $378,3 \text{ duisend} \times 3 = 1\,134,9 \text{ duisend}$ <p>∴ The statement is valid/Die bewering is geldig. <math>\checkmark \text{O}</math></p> <p style="text-align: center;"><b>OR/OF</b></p> $1\,157\,000 \div 3 \approx 385\,667 \quad \checkmark \text{RT} \quad \checkmark \text{CA}$ <p>∴ The statement is valid/Die bewering is geldig. <math>\checkmark \text{O}</math></p>	<p>1RT values</p> <p>1CA simplification</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1RT values</p> <p>1CA simplification</p> <p>1O conclusion</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1RT values</p> <p>1CA simplification</p> <p>1O conclusion [No penalty for omitting thousand]</p> <p>(3)</p>	D L4
4.2.4	<p>175,1    324,8    <b>405,7</b>    480,5    562,7    <b>600,8</b></p> <p style="text-align: right;"><math>\checkmark \text{MA}</math></p> <p>762,6    806,8    <b>856,2</b>    1594,0    3 556,0</p> <p><math>Q_1/K_1 = 405,7 \quad \checkmark \text{A}</math>    <math>Q_3/K_3 = 856,2 \quad \checkmark \text{A}</math></p> <p><math>IQR/IKO = (856,2 - 405,7) \times 1\,000 \quad \checkmark \text{M}</math></p> <p><math>= 450,5 \times 1000</math></p> <p><math>= 450\,500 \quad \checkmark \text{CA}</math></p>	<p>1MA order, ascending or descending</p> <p>2A <math>Q_1</math> and <math>Q_3</math></p> <p>1M subtracting quartiles</p> <p>1CA IQR value [No penalty for omitting thousand]</p> <p>(5)</p>	D L3



Q/V	Solution/Oplossing	Explanation/Verduideliking	T&L
4.2.5	<p>Tourism boosts the economy (selling and buying) of the country. ✓✓ O</p> <p><i>Toerismeversterk die ekonomie (koop en verkoop) van die land.</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Tourism assists people to know the places they want to visit and be prepared/ exposes the goods and services of a country ✓✓ O</p> <p><i>Toerisme help mense om die plekke wat hulle besoekte ken en om voor te berei/land se goedere en dienste kry blootstelling</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Brings income to the country and more tourist stimulate the economy. / GDP grows. ✓✓ O</p> <p><i>Dit bring ekstra inkomste na die land en meer toeriste stimuleer die ekonomie./ BBP groei.</i></p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Help to promote Social and Cultural interaction. ✓✓ O</p> <p><i>Bevorder sosiale en kulturele interaksie.</i></p>	<p>2O reason financial</p> <p>2O environmental reason</p> <p>2O economic reason</p> <p>2O humanitarian reason (2)</p>	<p>D L4</p>
4.2.6	<p style="text-align: center;">✓ M</p> <p>Total = <math>162\ 666,5455 \times 11 \approx 1\ 789\ 332</math> ✓ R</p> <p>Known data total = <math>471\ 928 + 170\ 113 + 119\ 639 + 107\ 230 + 76\ 496 + 120\ 343 + 179\ 450 + 226\ 003 + 172\ 282 = 1\ 643\ 484</math> ✓ A</p> <p>Wales = NE + 30 440</p> <p>NE + NE + 30 440 + 1 643 484 = 1 789 332 ✓ MA</p> <p>2NE = 115 408</p> <p>NE = 57 704 ✓ CA</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>Mean value/Gemiddelde waarde</p> $= \frac{\text{North East/Noordoos} + \text{Wales/Wallis} + \text{other} / \text{ander}}{11} \quad \checkmark M$ $\frac{\text{NE} + \text{NE} + 30\ 440 + 1\ 643\ 484}{11} = 162\ 666,5455 \quad \checkmark MA$ $2\text{NE} + 1\ 673\ 924 = 1\ 789\ 332,001 \quad \checkmark S$ $\frac{2\text{NE}}{2} = \frac{115\ 408,001}{2} \quad \checkmark M$ <p>NE = 57 704,00025</p> <p>Direct employment of North East = 57 704 ✓ R</p> <p><i>Direkte werkseleenthede van Noordooste = 57 704</i></p>	<p>1M multiplying with 11</p> <p>1R rounding</p> <p>1A known total</p> <p>1MA two unknowns</p> <p>1CA simplification</p> <p style="text-align: center;"><b>OR/OF</b></p> <p>1M concept of mean</p> <p>1MA two unknowns</p> <p>1S simplification</p> <p>1M dividing by 2</p> <p>1R rounding (5)</p>	<p>D L4</p>
		<b>[35]</b>	
		<b>TOTAL/TOTAAL:150</b>	

Notes to the Marking Guideline Mathematical Literacy P2 November 2018

Note: In any verification/opinion question, some form of calculation must be shown in order to give a mark for conclusion.

1.1.1	If the values are swapped, give only 1 mark
1.1.2	If the candidate starts with R153 947,72 and not show how it was calculated, Max 2 marks If they start with R189 880,76 and do a reverse VAT calculation, 0 marks.
1.1.5	Only calculation done and no explanation, Max 3 marks
1.2.1 (a)	Early rounding leading to a surface area of 6 and the litres required 24, Max 6 marks
1.2.1 (a)	Changing the formula by replacing a + with a ×, max 6
1.3	14:35 is worth 3 marks showing calculations; 18:55 is worth 3 marks with calculations. No calculations shown for these answers, 0 marks.
2.1.1 (b)	Omitting the value of A, max 2 marks provided it is arranged. Using the % share columns' data is a break-down, 0 marks, since not all data is shown.
2.1.2	"constantly increasing" is worth 1 mark.
2.1.3	"Both Pf and Fr fluctuate", max 3 marks.
2.1.5	One or two points plotted wrong, max 5 marks. Three or four plotted wrong, max 4 marks etc.
2.2.1	Adding the costs on the table is a break-down, 0 marks. Wrong formula, 0 marks
2.2.2	Wrong formula, 0 marks. Two wrong values, 0 marks. Incorrect order, max 1 mark.
2.2.3	Converting mark must be given if it is substituted without showing the time conversion.
2.2.3	After calculating both Post and Upfront costs the difference need not be shown, then the conclusion carries 2 marks.
3.1.1	Written as 4:9 or 4 out of 9, give 2 marks,
3.1.3 (b)	If ratio values are swapped, max 2 marks.
3.1.5	If they use 42km and 7 hours or 25,5 km and 4h15min, max 4 marks.
3.2.1	If both thicknesses not subtracted, $H = 26,156$ cm, max 6 marks
3.2.2(a)	Max of 4 marks if only one bucket's area is subtracted from pallet's area.
3.2.2(b)	No unit was specified, answer can be in mm or cm, thus 264mm is accepted. $C = 120 \text{ cm} - 100 \text{ cm} = 20 \text{ cm}$ , 3 marks.
4.1.1	Calculating discount on senior citizen, max 7 marks. Calculation: Adults 1 mark Discounted adults 2 marks Children 1 mark Senior citizens 1 mark Adding 1 mark Currency conversion 1 mark Conclusion 1 mark
4.2.1	If the values are swapped and the answer is negative, max 2 marks
4.2.2	With only 1 value in the numerator, max 2 marks.
4.2.4	VFR -not ordered: $1594,0 - 762,6 = 831,4$ thousand, 2 marks Business ordered: $609,6 - 273,0 = 336,6$ thousand, 3 marks Holiday ordered: $1\ 157,0 - 273,0 = 884$ thousand, 3 marks Wrong column used and not ordered, 0 marks

The following tolerance range was agreed upon during marking guideline discussions:

Questions 1.1.4, 1.2.1, 3.2.1, 4.1.1 (1 mark each)