# NATIONAL SENIOR CERTIFICATE
## *NASIONALE SENIOR SETIFIKAAT*

## GRADE/*GRAAD* 12

### MATHEMATICAL LITERACY P2/ *WISKUNDIGE GELETTERDHEID V2*

### NOVEMBER 2018

### 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/graph/document/diagram/*Lees vanaf tabel/grafiek/dokument/diagram* |
| SF | Correct substitution in a formula/*Korrekte vervanging in 'n 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/RCA | Rounding off/*Afronding* /Rounding with CA/*Afronding met CA* |
| NPR | No penalty for rounding/*Geen penalisasie vir afronding nie* |
| AO | Answer only/*Slegs antwoord* |
| MCA | Method with constant accuracy/*Metode met volgehoue akkuraatheid* |

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

**NOTE:**
- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled) version.
- Consistent accuracy (CA) applies in ALL aspects of the marking guidelines; however it stops at the second calculation error.
- 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 vraagdoodtrek(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.*

## QUESTION/*VRAAG* 1 [38 MARKS/*PUNTE*]

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

| Q/*V* | Solution/*Oplossing* | Explanation/*Verduideliking* | T&L |
|---|---|---|---|
| | | | F L3 |
| 1.1.4 | Interest Year 1/ *Jaar1 rente* <br><br> = 6% × R 1 250 000 = R 75 000 ✓ MA <br><br> Interest Year 2/ *Jaar2 rente* <br> ✓ CA <br> = 6% × (R 1250 000 + R 75 000) = R 79 500 ✓ CA <br><br> Interest rate 3 Months /*Rentekoers vir 3 maande* ✓ C <br><br> = 6% ÷ 4 = 1,5% or 6% × $\frac{3}{12}$ = 1,5% ✓ M <br><br> Interest 3 Months/*3 Maande rente* <br><br> = 1,5% × (R 1 325 000 + R 79 500) = R 21 067,50 ✓ CA <br><br> Interest earned/ *Rente verdien* <br> ✓ M ✓ CA <br> = R 75 000+ R 79 500 + R 21 067,50 = R 175 567,50 <br><br> Interest earned is not enough / not sufficient to cover the price of the bakkie. ✓ O <br> *Die rente verdien is nie genoeg om die aankoopprys te dek nie* <br><br> **OR/*OF*** <br><br> 27 months = 2 years and 3 months **or** $2\frac{1}{4}$ years <br><br> *27 maande = 2 jaar en 3 maande of* $2\frac{1}{4}$*jaar* ✓ C <br><br> 1st year value/*1ste jaar waarde* <br> ✓ MA ✓ CA <br> = R1 250 000 × 6% + R1 250 000 = R1 325 000 <br><br> 2ⁿᵈ year value/*2de jaar waarde* <br> ✓ CA <br> = R1 325 000 × 6% + R1 325 000 = R1 404 500 <br><br> Last 3 months/*Laaste 3 maande* <br> 6% ✓ M ✓ CA <br> = R1 404 500 × $\frac{6\%}{4}$ + R1 404 500 = R1 425 567,50 <br><br> Difference/*Verskil* <br> ✓ MA ✓ CA <br> = R1 425 567,50 – R1 250 000 = R175 567,50 <br><br> It is not enough / not sufficient /*Dit is nie genoeg nie*. ✓ O <br><br> **OR/*OF*** <br> Value the interest after 27 months/ *Rentewaarde na 27 maande* <br> ✓✓M ✓ M ✓✓CA ✓ C <br> = R1 250 000 × 1,06 × 1,06 × 1,015 – R1 250 000 <br><br> = R1 425 567,50 – R1 250 000 ✓MA <br> ✓CA <br> = R175 567,50 <br><br> Not enough / not sufficient /*Nie genoeg nie*. ✓O | 1MA calculating interest <br><br> 1CA 1ˢᵗ year value <br> 1CA 2ⁿᵈ year interest <br> 1C conversion to years (allocated since there are 3 periods) <br> 1M dividing % value by 4 (or the interest by 4) <br><br> 1CA last 3 months interest <br><br> 1M adding the interest values <br> 1CA available amount <br><br> 1O conclusion <br><br> **OR /*OF*** <br><br> 1C conversion to years <br><br> 1MA calculating interest <br> 1CA 1ˢᵗ year value <br><br> 1CA 2ⁿᵈ year value <br><br> 1M dividing % value by 4 <br> 1CA last 3 months value <br><br> 1MA subtracting <br> 1CA available amount <br><br> 1O conclusion <br><br> **OR/*OF*** <br> 2M multiply the principal with 106 % <br> 1M 2ⁿᵈ year value <br> 2CA 3months rate and value <br> 1C conversion to years <br> 1MA subtracting <br> 1CA available amount <br> 1O conclusion (9) | |

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

| Q/*V* | Solution/*Oplossing* | Explanation/*Verduideliking* | T&L |
|---|---|---|---|
| 1.2.1 (a) | Surface area of an open box/*Buite opp. van oopboks* ✓ SF<br>= Width × length + 2(length × height + width × height) ✓A<br>= 1,374 m × 1,807 m + 2(1,807 m × 0,535 m +1,374 m × 0,535 m)<br><br>= 2,482818 m² + 2 (1,701835 m²)    ✓ S<br><br>= 5,886488m²    ✓CA<br><br>Surface area of bin (bakkie)/*Opp. van bak*<br>   ✓MCA<br>= 5,886488 m² + 2% × 5,886488 m²<br>= 5,886488 m² + 0,11772976 m²<br>= 6, 00421776 m²  ✓CA<br><br>**Or/of**<br>= 1,02 × 5,886488 m²<br>= 6, 00421776 m²<br><br><br>Number of litres required/*Aantal liter benodig*<br>$= \dfrac{6,00421776 \text{ m}^2}{0,25 \text{ m}^2/\ell}$    ✓MA<br><br>= 24,01687104 ≈ 25 ℓ  ✓R | 1SF Substitution<br>1A correct values used<br><br><br>1S simplification<br><br>1CA total area<br><br><br><br>1MCA increasing by 2%<br><br><br>1CA simplification<br><br><br><br><br><br><br><br>1MA dividing with spread rate<br><br><br>1R rounding up litres<br><div align="right">(8)</div> | M<br>L3 |
| 1.2.1 (b) | Cost = Number of 5 litre × 2 coats × Price per 5 litre<br>*Koste = Aantal 5 liters × 2 lae × prys per 5ℓ*<br>    ✓ CA<br>$= \dfrac{25}{5} × 2 × R549,00$  ✓MCA<br>= R5 490,00 ✓ CA<br><div align="center">**OR/OF**</div><br>    ✓MCA<br>For two coats of paint = 25 × 2 = 50 litres<br><br>Number of 5 litre tins $= \dfrac{50}{5} = 10$  ✓ CA<br><br>Cost = 10 × R5 49 = R5 490    ✓ CA | CA from 1.2.1(a)<br><br>1CA number of 5 litres<br>1MCA multiply 2 by price<br><br>1CA cost for 10 litres<br><div align="center">**OR/OF**</div><br>1MCA multiply by 2<br><br>1CA number of 5 litres<br><br>1CA cost<br>**AO**<br><div align="right">(3)</div> | F<br>L2 |

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

| Q/*V* | Solution/*Oplossing* | Explanation/*Verduideliking* | T&L |
|---|---|---|---|
| 2.1.1 (a) | $A = \dfrac{216\,329 \; \checkmark^{MA} - 227\,665}{227\,665 \; \checkmark A} \times 100\%$  $= -4{,}979\% \; \checkmark A$  $\approx -5\% \quad \checkmark RCA$ | 1MA subtracting correct values 1A denominator 1A negative simplification  1RCA value of **A** (4) | D L2 |
| 2.1.1 (b) | $-12 \; ;-5 \; ;-2 \; ;-1 \; ; 0 \; ; 2 \; ; 5 \; ; 10 \; ; 13 \; ; 13 \; ; 16 \; ; 18 \; ; 19 \; ;^{\checkmark MCA} 40$  Median/*Mediaan* $= \dfrac{5\% + 10\%}{2} \quad \checkmark M$  $= 7{,}5\% \qquad \checkmark CA$ | CA from 2.1.1(a) 1MCA arranging  1M median concept  1CA median (3) | D L3 |
| 2.1.2 | $\checkmark A$ As the year increased the value of the imports of make-up and skincare increased. $\checkmark A$ *Soos die jare aangaan, het die waarde van die invoere van grimering en versorg vermeerder.* | 1A year increased 1A value increased  (2) | D L4 |
| 2.1.3 | $\checkmark A$ **Fr:** import share increased from 2013 to 2014 $^{\checkmark O}$, but decreased in 2015. *RW:invoer vermeerder in 2014 vanaf 2013, maar verminder in 2015*  $\checkmark A$ **Pf:** import share decreased from 2013 to 2014, but increased $^{\checkmark O}$ in 2015. *Pf:invoer verminder in 2014 vanaf 2013, maar vermeerder in 2015.* | 1A product 1O reasoning    1A product 1O reasoning   (4) | D L4 |
| 2.1.4 | $\checkmark O$ No. Too many sectors and one pie chart cannot be used as $^{\checkmark O}$ different years need to be shown. *Nee. Teveel sektore om op een sirkeldiagram te toon omdat verskillende jare getoon moet word.*  **OR/*OF*** $\checkmark O \qquad\qquad\qquad \checkmark O$ No. Too many sectors/columns; some are too small /negligible. *Nee. Te veel sektore/kolomme; sommige is te klein.*  **OR/*OF*** $\checkmark O \qquad\qquad \checkmark O$ No. Negative values will be difficult to indicate. *Nee. Negatiewe waardes maak dit moeilik.*  $\checkmark O$ **OR/*OF*** $\checkmark O$ No. Percentages do not add up to 100%. *Nee. Persentasies tel nie op tot 100% nie.* | 1O No 1O reason    (2) | D L4 |

| Q/*V* | Solution/*Oplossing* | Explanation/*Verduideliking* | T&L |
|---|---|---|---|
| 2.1.5 | **Percentage imports and average growth of Personal Care and Cosmetics to Australia**<br><br><br><br>1A first point<br>1A last point<br>3 × 1A Every other two points correctly plotted<br>1A Joining | | D<br>L3 |
|  |  |  | (6) |

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

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

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

| Q/*V* | Solution/*Oplossing* | Explanation/*Verduideliking* | T&L |
|---|---|---|---|
| 3.1.5 | The average speed required to beat the cut-off 2:<br>*Die gemiddelde spoed nodig om afsny 2 te haal:*<br><br>Speed/Spoed(marathon) $= \dfrac{31,5\text{km}}{5\text{h}15\text{min}}$ ✓RT ✓M<br><br>$= 6$ km/h ✓CA<br><br><br>Speed/*Spoed*(½ marathon) $= \dfrac{16,5\text{km}}{5\text{h}}$ ✓MA<br><br>$= 3,3$ km/h ✓CA<br><br>✓O<br>The claim is correct $(6 - 3,3 = 2,7$ km/h).<br>*Die bewering is korrek.*<br><div align="center">**OR/*OF***</div><br>✓M<br>Speed/*Spoed*(½ marathon) $= 16,5$ km $\div 5$h $= 3,3$ km/h ✓CA<br>Increased speed for full marathon $= (3,3 + 2,7)$ km/h $= 6$km/h ✓MA<br>✓MA<br>Distance $= 6$ km/h $\times 5,25$h $= 31,5$ km ✓CA<br>Correct/*Korrek* ✓O<br><div align="center">**OR/OF**</div><br>✓M<br>Speed/*Spoed*(½ marathon) $= 16,5$ km $\div 5$h $= 3,3$ km/h ✓CA<br>✓MA<br>Increased speed for full marathon $= (3,3 + 2,7)$ km/h $= 6$km/h<br>✓MA<br>Time to cut-off $= \dfrac{31,5\text{km}}{6\text{km/h}} = 5,25$ h ✓CA<br>Correct/*Korrek* ✓O | 1RT correct values (dist. & time)<br>1M calculating speed / change the subject<br>1CA simplification<br><br><br>1MA calculating speed<br><br>1CA 2nd speed<br><br>1O conclusion<br><br><div align="center">**OR/*OF***</div><br>1M calculating speed / change the subject<br>1CA simplification<br>1MA calculating incr. speed<br>1MA calculating distance<br>1CA distance<br>1O conclusion<br><div align="center">**OR/*OF***</div><br>1M calculating speed / change the subject<br>1CA simplification<br>1MA calculating incr. speed<br>1MA calculating time<br>1CA time<br>1O conclusion<br><div align="right">(6)</div> | **MP**<br>**L4** |
| 3.2.1 | $20\ \ell = 20 \times 1\,000\ \text{cm}^3$ ✓ C<br><br>Inner diameter /*Binneste middellyn* $= 31,2$ cm $- 2 \times 0,2$ cm<br>$= 30,8$ cm ✓A<br><br>✓ MCA<br>$V = 3,142 \times (30,8\text{cm} \div 2)^2 \times$ height/*hoogte*<br><br>✓SF<br>$20\,000\ \text{cm}^3 = 3,142 \times \left(\dfrac{30,8}{2}\text{cm}\right)^2 \times \mathbf{H}$<br><br>$H = \dfrac{20\,000\ \text{cm}^3}{3,142 \times\ 237,16\text{cm}^2}$ ✓ M<br><br>$= \dfrac{20\,000}{745,15672}$ cm ✓ S<br><br>$= 26,84$ cm ✓ CA | 1C conversion<br><br>1A calculating inner diameter<br><br><br>1MCA radius<br><br>1SF correct values<br><br><br>1M changing the subject<br><br>1S simplification<br><br>1CA height<br><div align="right">(7)</div> | M<br>L3 |

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

**QUESTION/*VRAAG* 4 [35 MARKS/*PUNTE*]**

| Q/*V* | Solution/*Oplossing* | Explanation/*Verduideliking* | T&L |
|---|---|---|---|
| 4.1.1 | Total for these capsules/*totaal vir hierdie kapsules*<br><br>$\overset{\checkmark MA}{=23\times}\ \overset{\checkmark\checkmark MA}{£27+5\times £27\times 90\%}+\overset{\checkmark MA}{8\times £22}+\overset{\checkmark MA}{7\times £25,50}$<br><br>$= £621 + £121,50 + £176 + £178,50$<br><br>$= £1\ 097$ ✓ CA<br><br>Rand value/*waarde* $= £1\ 097 \times R16,58/ £$<br><br>$\qquad = R18\ 188,26$ ✓ C<br><br>∴ the statement is not correct/*die opmerking is nie korrek nie* ✓O<br><br>**OR/OF**<br><br>Without discount for 5/*sonder afslag vir 5*<br>$\overset{\checkmark MA}{=28\times £27}+\overset{\checkmark MA}{8\times £22}+7\times £25,50$ ✓ MA<br><br>$= £756 + £176 + £178,50$<br><br>$= £1\ 110,50$ ✓ CA<br><br>Discount for 5/*Afslag vir 5* $= 5 \times £27 \times 10\%$<br>$\qquad\qquad\qquad = £13,50$ ✓ A<br><br>Total ticket price/*Totale kaartjie prys*<br><br>$= £1\ 110,50 – £13,50 = £1\ 097$ ✓ CA<br><br>Rand value/*waarde*<br>$= £1\ 097 \times R16,58 /£ = R18\ 188,26$ ✓ C<br><br>NOT correct/*NIE korrek NIE* ✓ O<br>**OR/OF**<br>Cost of Capsule 24 + Cost of Capsule 30 – Discount for 5 Adults<br>$\overset{\checkmark MA}{(18\times £27+7\times £22}+2\times £25,50)+$ ✓ M<br>$\overset{\checkmark MA}{(10\times £27+1\times £22}+5\times £25,50)-\overset{\checkmark A}{5\times £27\times 10\%}=$<br>$£691 + £419,5 – \overset{\checkmark CA}{£13,5} = £1097$ ✓ CA<br><br>Rand value/*waarde*<br>$= £1\ 097 \times R16,58 /£ = R18\ 188,26$ ✓ C<br>NOT correct/*NIE korrek NIE* ✓ O | 3MA multiply tickets by price<br>2MA discount for 5<br><br><br>1CA total for 2 capsules<br><br><br>1C pounds to rand<br><br><br>1O conclusion<br><br><br><br>**OR/OF**<br><br><br>3MA multiply tickets by price<br><br><br><br>1CA simplification<br><br><br><br>1A discount<br><br><br><br><br>1CA total<br><br><br>1C pounds to rand<br><br><br>1O conclusion<br>**OR/OF**<br><br>2MA multiply tickets by price<br>1M adding costs<br>1A discount<br><br>1CA simplification<br>1CA total<br><br><br>1C pounds to rand<br><br>1O conclusion | F<br>L4 |

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

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

| Q/*V* | Solution/*Oplossing* | Explanation/*Verduideliking* | T&L |
|---|---|---|---|
| 4.2.5 | Tourism boosts the economy (selling and buying) $\checkmark\checkmark$O of the country.<br>*Toerismeversterk die ekonomie (koop en verkoop) van die land.*<br><br>**OR/*OF*** | 2O reason financial | D<br>L4 |
| | Tourism assists people to know the places they want to visit and be prepared/ exposes the goods and services of a country                                     $\checkmark\checkmark$ O<br>*Toerisme help mense om die plekke wat hulle besoekte ken en om voor te berei/land se goedere en dienste kry blootstelling*<br><br>**OR/*OF*** | 2O environmental reason | |
| | Brings income to the country and more tourist stimulate the economy. / GDP grows.                         $\checkmark\checkmark$ O<br>*Dit bring ekstra inkomste na die land en meer toeriste stimuleer die ekonomie./ BBP groei.*<br><br>**OR/*OF*** | 2O economic reason | |
| | Help to promote  Social and Cultural interaction.     $\checkmark\checkmark$ O<br>*Bevorder sosiale en kulturele interaksie.* | 2O humanitarian  reason<br><div align="right">(2)</div> | |
| 4.2.6 | $\overset{\checkmark \ \ M}{\text{Total}} = 162\ 666{,}5455 \times 11 \approx 1\ 789\ 332$   $\checkmark$ R<br><br>Known data total = 471 928 + 170 113 + 119 639 + 107 230 + 76 496 + 120 343 + 179 450 + 226 003 + 172 282<br>          = 1 643 484   $\checkmark$ A<br>Wales = NE + 30 440<br>NE + NE + 30 440 + 1 643 484 = 1 789 332     $\checkmark$ MA<br>2NE = 115 408<br>NE = 57 704    $\checkmark$ CA<br><br>**OR/*OF***<br>Mean value/*Gemiddelde waarde*<br>$= \dfrac{\text{North East/}\textit{Noordoos} + \text{Wales/}\textit{Wallis} + \text{other / }\textit{ander}}{11}$ $\overset{\checkmark \ M}{\phantom{x}}$<br><br>$\dfrac{\overset{\checkmark \ MA}{NE + NE + 30\ 440 + 1\ 643\ 484}}{11} = 162\ 666{,}5455$<br><br>$2NE + 1\ 673924   =  1\ 789\ 332{,}001$ $\overset{\checkmark \ S}{\phantom{x}}$<br><br>$\dfrac{2NE}{2}  = \dfrac{115\ 408{,}001}{2}$   $\checkmark$ M<br><br>NE= 57 704,00025<br><br>Direct employment of North East = 57 704     $\checkmark$ R<br>*Direkte werksgeleenthede van Noordooste = 57 704* | 1M multiplying with 11<br>1R rounding<br><br><br>1A known total<br><br><br><br>1MA two unknowns<br><br>1CA simplification<br><br>**OR/*OF***<br><br>1M concept of mean<br><br><br><br>1MA two unknowns<br><br>1S simplification<br><br><br>1M dividing by 2<br><br><br><br>1R rounding<br><div align="right">(5)</div> | D<br>L4 |
| | | **[35]** | |
| | | **TOTAL/*TOTAAL*:150** | |