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**LIMPOPO**

PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
**EDUCATION**

**NATIONAL SENIOR CERTIFICATE /  
*NASIONALE SENIOR SERTIFIKAAT***

**GRADE/GRADE 12**

**MATHEMATICS P1/WISKUNDE V1  
MARKING GUIDELINES/NASIENRIGLYNE  
PRE – TRIAL EXAM 2025**

**MARKS/PUNTE: : 150**

**These marking guidelines consist of 16 pages/ *Hierdie nasienriglyne bestaan uit 16 bladsye***



**NOTE/NOTA:**

- If a candidate answers a question TWICE, only mark the FIRST attempt/ *As 'n kandidaat 'n vraag TWEE keer beantwoord, merk slegs die EERSTE poging*
- Consistent accuracy applies in ALL aspects of the marking guidelines/ *Konsekwente akkuraatheid is van toepassing in ALLE aspekte van die nasienriglyne*

**QUESTION 1 / VRAAG 1**

|     |       |                                                                                                                                                                 |                                                                                                                                                                                                                  |     |
|-----|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 1.1 | 1.1.1 | $x(x+3) = 0$<br>$x = 0$ or $x = -3$                                                                                                                             | $\checkmark x = 0$<br>$\checkmark x = -3$                                                                                                                                                                        | (2) |
|     | 1.1.2 | $3x^2 - 4x = 5$<br>$3x^2 - 4x - 5 = 0$<br>$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(-5)}}{2(3)}$<br>$x = \frac{4 \pm \sqrt{76}}{6}$<br>$x = 2,12$ or $x = -0,79$ | $\checkmark$ standard form/ <i>standaard vorm</i><br>$\checkmark$ substitution/ <i>vervanging</i><br>$\checkmark x = 2.12$<br>$\checkmark x = -0,79$                                                             | (4) |
|     | 1.1.3 | $\sqrt{5-x} = 1+x$<br>$(\sqrt{5-x})^2 = (1+x)^2$<br>$5-x = x^2 + 2x + 1$<br>$x^2 + 3x - 4 = 0$<br>$(x+4)(x-1) = 0$<br>$\therefore x \neq -4$ or $x = 1$         | $\checkmark$ squaring / <i>vierkant</i><br>$\checkmark$ simplification/ <i>vereenvoudig</i><br>$\checkmark$ standard form/ <i>standaard vorm</i><br>$\checkmark x - \text{values/waardes}$<br>$\checkmark x = 1$ | (5) |





|     |                                                                                                                                                                                                                                                       |                                                                                                                                                                                      |     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 1.3 | $\sqrt[3]{\frac{49^{1010} + 7^{2019}}{7^{2019}}}$ $= \sqrt[3]{\frac{7^{2(1010)} + 7^{2019}}{7^{2019}}}$ $= \sqrt[3]{\frac{7^{2020} + 7^{2019}}{7^{2019}}}$ $= \sqrt[3]{\frac{7^{2019}(7+1)}{7^{2019}}}$ $= \sqrt[3]{8}$ $= (2^3)^{\frac{1}{3}}$ $= 2$ | <p>✓ exponential<br/>form/<i>eksponensiale vorm</i></p> <p>✓ simplification/<br/><i>vereenvoudig</i></p> <p>✓ commonfactor/<i>gemeenskfaktor</i></p> <p>✓ answer/<i>antwoord</i></p> | (4) |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|



**QUESTION 2/VRAAG 2**

|     |       |                                                                                                                                                                                                                                                                        |                                                                                             |     |
|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----|
| 2.1 | 2.1.1 | $\begin{array}{ccccc} 16 & & 22 & & 28 \\ & \diagdown & & \diagup & \\ & 6 & & 6 & \end{array}$ $d = 6$ $T_n = a + (n-1)d$ $= 16 + (n-1)6$ $= 6n + 10$                                                                                                                 | ✓ $d = 6$<br><br>✓ substitution/ <i>vervang</i><br>✓ answer/ <i>antwoord</i>                | (3) |
|     | 2.1.2 | $T_n = 6n + 10$ $T_{100} = 6(100) + 10$ $= 610$                                                                                                                                                                                                                        | ✓ substitution/ <i>vervang</i><br>✓ answer/ <i>antwoord</i>                                 | (2) |
|     | 2.1.3 | $T_n = 310$ $6n + 10 = 310$ $6n = 300$ $n = 50$                                                                                                                                                                                                                        | ✓ equating/ <i>gelykstel</i><br>✓ substitution/ <i>vervang</i><br>✓ answer/ <i>antwoord</i> | (3) |
| 2.2 | 2.2.1 | $\begin{array}{ccccccc} 8 & & x & & -4 & & x-24 \\ & \diagdown & & \diagup & & \diagdown & \\ & x-8 & & -4-x & & x-20 & \\ & \diagdown & & \diagup & & \diagdown & \\ & 4-2x & & 2x-16 & & & \end{array}$ $-2x + 4 = 2x - 16$ $-2x - 2x = -16 - 4$ $-4x = -20$ $x = 5$ | ✓ second difference/ <i>2e verskil</i><br><br>✓ equating/ <i>gelykstel</i><br><br>✓ $x = 5$ | (3) |

|  |       |                                                                                                                                                                                                        |                                                                                                                                                        |     |
|--|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|  | 2.2.2 | $T_n = -6n + 3$<br><br>$s_n = \frac{n}{2}[-3 + (-6n + 3)]$<br><br>$-300 = -6n^2$<br><br>$-50 = -6n^2$<br><br>$7.07 = n$<br><br>$\therefore n > 0$<br><br>$\therefore s_n < 300 \quad \therefore n = 7$ | $\checkmark T_n = -6n + 3$<br><br>$\checkmark s_n = \frac{n}{2}[-3 + (-6n + 3)]$<br><br>$\checkmark -300 = -6n^2$<br><br>$\checkmark \therefore n = 7$ | (4) |
|--|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

**QUESTION 3/VRAAG 3**

|     |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                   |     |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----|
| 3.1 | $4 ; \frac{4}{5}x ; \frac{4}{25}x^2$                                                                                                                                                                                                                                                                                  | ✓ answer/antwoord                                                                                                                 | (1) |
| 3.2 | $-1 < r < 1$<br>$-1 < \frac{x}{5} < 1$<br>$-5 < x < 5$                                                                                                                                                                                                                                                                | ✓ substitution/vervangings<br>✓ answer/antwoord                                                                                   | (2) |
| 3.3 | $S_{\infty} = \frac{a}{1-r}$<br>$= \frac{4}{1-\frac{x}{5}}$<br>$= \frac{20}{5-x}$                                                                                                                                                                                                                                     | ✓ $\frac{x}{5}$<br>✓ substitution/vervangings<br>✓ answer/antwoord                                                                | (3) |
| 3.4 | $S_{\infty} - S_n < 0,0001$ $S_{\infty} = 5$ if $x = 1$<br>$5 - \frac{4 \left[ 1 - \left( \frac{1}{5} \right)^n \right]}{1 - \frac{1}{5}} < 0,0001$<br>$4 - 4 + 4(0,2)^n < 0,00008$<br>$\frac{4(0,2)^n}{4} < \frac{0,00008}{4}$<br>$(0,2)^n < 0,00002$<br>$n > \frac{\log 0,00002}{\log 0,2}$<br>The smallest $n > 7$ | ✓ method /metode<br>✓ substitution/vervangings<br>✓ simplification/<br>vereenvoudig<br>✓ $(0,2)^n < 0,00002$<br>✓ answer/antwoord | (5) |

**QUESTION 4/ VRAAG 4**

|     |       |                                                                                                                                                                                                       |                                                                                                                                                                                 |     |
|-----|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 4.1 | 4.1.1 | $g(x) = x^2 + 2x - 15 = 0$<br>$(x+5)(x-3) = 0$<br>$\therefore x = -5 \quad \text{or} \quad x = 3$<br>$A(-5; 0) \quad ; \quad B(3; 0)$<br>$f(x) = x + 5$<br>$= 0 + 5$<br>$= 5$<br>$\therefore K(0; 5)$ | $\checkmark$ factors/ <i>faktor</i><br>$\checkmark$ $x$ – values/ <i>waardes</i><br><br>$\checkmark$ $K(0; 5)$                                                                  | (3) |
|     | 4.1.2 | $g(x) = -x^2 - 2x + 15$<br>$g(0) = 15$<br>$D(0; 15)$                                                                                                                                                  | $\checkmark$ $D(0; 15)$                                                                                                                                                         | (1) |
|     | 4.1.3 | $x = \frac{-b}{2a} = \frac{-(-2)}{2(-1)}$<br>$= -1$<br>$g(-1) = -(-1)^2 - 2(-1) + 15$<br>$= 18$<br>$E(-1; 18)$                                                                                        | $\checkmark$ answer/ <i>antwoord</i><br>$\checkmark$ answer/ <i>antwoord</i><br><br>$\checkmark$ substitution/ <i>vervanging</i><br>$\checkmark$ answer/ <i>antwoord</i>        | (4) |
| 4.2 |       | $EL = -x^2 - 2x + 15 - (x + 5)$<br>$= -x^2 - 2x + 15 - x - 5$<br>$= -(-1)^2 - 3(-1) + 10$<br>$= 12 \text{ units}$                                                                                     | $\checkmark$ equating/ <i>gelykstel</i><br>$\checkmark$ substitution/ <i>vervanging</i><br>$\checkmark$ substitution/ <i>vervanging</i><br>$\checkmark$ answer/ <i>antwoord</i> | (4) |
| 4.3 |       | $y \leq 5; y \in R$                                                                                                                                                                                   | $\checkmark$ answer/ <i>antwoord</i>                                                                                                                                            | (1) |
| 4.4 |       | $-5 < x < 3$                                                                                                                                                                                          | $\checkmark \checkmark$ answer/ <i>antwoord</i>                                                                                                                                 | (2) |



|     |                                                                                                                                                                    |                                                                                                                                                                                       |     |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 4.5 | $-x^2 - 2x + 15 = x + 5$<br>$-x^2 - 3x + 10 = 0$<br>$x^2 + 3x - 10 = 0$<br>$(x + 5)(x - 2) = 0$<br>$x = -5 \quad \text{or} \quad x = 2$<br>$f(2) = 2 + 5$<br>$= 7$ | ✓ equating/ <i>gelykstel</i><br>✓ simplification/<br><i>vereenvoudig</i><br>✓ standard form/ <i>standaard vorm</i><br><br>✓ $x$ – values/ <i>waardes</i><br>✓ answer/ <i>antwoord</i> | (5) |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

**QUESTION 5/ VRAAG 5**

|     |                                                                                                                                                                                                                                                |                                                                                                                                         |                |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 5.1 | $k = 4$<br>$d = 5$<br>$p = 2$                                                                                                                                                                                                                  | ✓ $k = 4$<br>✓ $d = 5$<br>✓ $p = 2$                                                                                                     | (3)            |
| 5.2 | $y = \frac{5-x}{x-2}$<br>$\begin{array}{r} -1 \\ x-2 \overline{) -x+5} \\ \underline{-x+2} \\ 3 \end{array}$ $\therefore y = \frac{3}{x-2} - 1$<br><b>OR</b><br>$y = \frac{5-x}{x-2}$<br>$y = \frac{-(x-2)+3}{x-2}$<br>$y = \frac{3}{x-2} - 1$ | ✓ method / <i>metode</i><br><br>✓ answer/ <i>antwoord</i><br><br><b>OR</b><br><br>✓ method / <i>metode</i><br>✓ answer/ <i>antwoord</i> | (2)<br><br>(2) |



|     |                                                                                                                                                                                                                     |                                                                                                                                 |     |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----|
| 5.3 | $y = x - 3$ at $C(5; 0)$<br>for $x$ - value                      for $y$ - value<br>$y = 5 - 3$ $0 = x - 3$<br>$y = 2$ $x = 3$<br>$\therefore C'(3; 2)$<br><b>OR</b><br>$C'(0 + 3)(5 - 3)$<br>$\therefore C'(3; 2)$ | ✓ method / <i>metode</i><br>✓ answer/ <i>antwoord</i><br><br><b>OR</b><br>✓ method / <i>metode</i><br>✓ answer/ <i>antwoord</i> | (2) |
| 5.4 | $f(x) = -1$<br>$\log_4 x = -1$<br>$x = 4^{-1}$<br>$x = \frac{1}{4}$<br>$f(x) = 1$<br>$\log_4 x = 1$<br>$x = 4$<br>$\therefore \frac{1}{4} \leq x \leq 4$                                                            | ✓ $x = \frac{1}{4}$ and $x = 4$<br><br>✓ $\frac{1}{4} \leq x \leq 4$                                                            | (2) |
| 5.5 | $f(x) = \log_4 x$<br>$4^y = x$<br>$y = 4^x$<br>$\therefore f^{-1}(x) = 4^x$                                                                                                                                         | ✓ $4^y = x$<br>✓ answer/ <i>antwoord</i>                                                                                        | (2) |
| 5.6 | Domain of $f^{-1} : x \in R$                                                                                                                                                                                        | ✓ answer/ <i>antwoord</i>                                                                                                       | (1) |
| 5.7 | $1 \leq x < 2$ <b>OR</b> $[1; 2)$                                                                                                                                                                                   | ✓ answer/ <i>antwoord</i>                                                                                                       | (1) |

**QUESTION 6/ VRAAG 6**

|     |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                               |     |
|-----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 6.1 |       | $A = P(1+i)^n$ $650\,000 = P(1-0,15)^5$ $P = \frac{650\,000}{(1-0,15)^5}$ $= 1\,464\,936,26$                                                                                                                                                                                                                                                                                                                                                                  | ✓ substitution/vervangi<br>ng<br>✓ simplification/<br>vereenvoudig<br>✓ answer/antwoord                                                                                       | (3) |
| 6.2 |       | $A = P(1+i)^n \quad A = P(1+in)$ $x \left(1 + \frac{0,08}{12}\right)^{6 \times 12} = (90\,000 - x)(1 + 0,09 \times 6)$ $1,61350216x = 138\,600 - 1,54x$ $3,153502167x = 138\,600$ $x = R43\,951,14$ <p>R43 951,14 for compound interest and<br/>R46 048,86 for simple interest</p>                                                                                                                                                                            | ✓ substitution/vervangi<br>ng<br>✓ substitution/vervangi<br>ng<br>✓ simplification/<br>vereenvoudig<br>✓ answer/antwoord<br>✓ answer/antwoord                                 | (5) |
|     | 6.3.1 | $P = \frac{x \left[1 - (1+i)^{-n}\right]}{i}$ $5\,000\,000 = \frac{40\,000 \left[1 - \left(1 + \frac{0,085}{12}\right)^{-n}\right]}{\frac{0,085}{12}}$ $\frac{5\,000\,000}{40\,000} \times \frac{0,085}{12} = \left[1 - \left(1 + \frac{0,085}{12}\right)^{-n}\right]$ $\frac{11}{96} = \left(\frac{2417}{2400}\right)^{-n}$ $-n = \log_{\left(\frac{2417}{2400}\right)}\left(\frac{11}{96}\right)$ $-n = -306,9341289$ <p>He will be paid for 307 months</p> | ✓ $\frac{0,085}{12}$<br>✓ substitution/vervangi<br>ng<br>✓ simplification/<br>vereenvoudig<br><br>✓ correct use of logs/<br>korrekte gebruik van<br>logs<br>✓ answer/antwoord | (5) |

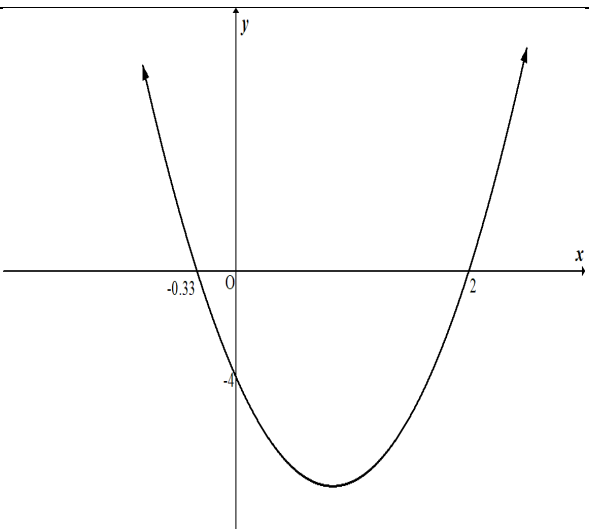
|  |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                  |     |
|--|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|  | 6.3.2 | $P_v = \frac{x \left[ 1 - (1+i)^{-n} \right]}{i}$ $= \frac{40\,000 \left[ 1 - \left( 1 + \frac{0,085}{12} \right)^{-0,9341289} \right]}{\frac{0,085}{12}}$ $= R37\,110,96$ <p><b>OR</b></p> $B = A - F_v$ $= P(1+i)^n - \left[ \frac{x \left[ (1+i)^n - 1 \right]}{i} \right]$ $= 5\,000\,000 \left( 1 + \frac{0,085}{12} \right)^{306} - \left[ \frac{40\,000 \left[ \left( 1 + \frac{0,085}{12} \right)^{306} - 1 \right]}{\frac{0,085}{12}} \right]$ $= R37\,110,96$ | <p>✓ value of <i>n/waarde van n</i></p> <p>✓ substitution/<i>vervangi</i>ng</p> <p>✓ answer/<i>antwoord</i></p> <p><b>OR</b></p> <p>✓ value of <i>n/waarde van n</i></p> <p>✓ substitution/<i>vervangi</i>ng</p> <p>✓ answer/<i>antwoord</i></p> | (3) |
|--|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|



**QUESTION 7/ VRAAG 7**

|     |       |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                      |     |
|-----|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 7.1 |       | $f(x) = 5x^2$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{5(x+h)^2 - 5x^2}{h}$ $= \lim_{h \rightarrow 0} \frac{5(x^2 + 2xh + h^2) - 5x^2}{h}$ $= \lim_{h \rightarrow 0} \frac{5x^2 + 10xh + 5h^2 - 5x^2}{h}$ $= \lim_{h \rightarrow 0} \frac{h(10x + 5h)}{h}$ $= \lim_{h \rightarrow 0} 10x + 5h$ $= 10x$ | $\checkmark 5(x+h)^2$<br>$\checkmark$ simplification/<br><i>vereenvoudig</i><br>$\checkmark$ common factor/ <i>gemeensk</i><br><i>faktor</i><br>$\checkmark \lim_{h \rightarrow 0} 10x + 5h$<br>$\checkmark$ answer/ <i>antwoord</i> | (5) |
| 7.2 | 7.2.1 | $f(x) = 3x^3 - 5x + \sqrt{x^2}$ $f(x) = 3x^3 - 5x + x$ $f'(x) = 9x^2 - 4$                                                                                                                                                                                                                                                                              | $\checkmark x$<br>$\checkmark 9x^2$<br>$\checkmark -4$                                                                                                                                                                               | (3) |
|     | 7.2.2 | $y = \frac{x^2 - 2x - 8}{x - 4}$ $= \frac{(x-4)(x+2)}{x-4}$ $= x + 2$ $\frac{dy}{dx} = 1$                                                                                                                                                                                                                                                              | $\checkmark \frac{(x-4)(x+2)}{x-4}$<br>$\checkmark x + 2$<br>$\checkmark 1$                                                                                                                                                          | (3) |
|     | 7.2.3 | $f(x) = x^3 - \frac{3}{\sqrt[3]{x^2}}$ $= x^3 - 3x^{-\frac{2}{3}}$ $f'(x) = 3x^2 + \frac{2}{x^{\frac{5}{3}}}$                                                                                                                                                                                                                                          | $\checkmark \frac{3}{\sqrt[3]{x^2}}$<br>$\checkmark 3x^2$<br>$\checkmark \frac{2}{x^{\frac{5}{3}}}$                                                                                                                                  | (3) |

**QUESTION 8/ VRAAG 8**

|     |                                                                                                                                                                                                                                           |                                                                                                                                                                                                 |     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 8.1 | $f(x) = (2x-1)(x^2-2x-3)$<br>$= 2x^3 - 4x^2 - 6x - x^2 + 2x + 3$<br>$= 2x^3 - 5x^2 - 4x + 3$<br>$f'(x) = 6x^2 - 10x - 4$<br>$x = 2 \quad \text{or} \quad x \neq -\frac{1}{3}$<br>$y = 2(2)^3 - 5(2)^2 - 4(2) + 3$<br>$= -9$<br>$A(2; -9)$ | $\checkmark f(x) = 2x^3 - 5x^2 - 4x + 3$<br>$\checkmark f'(x) = 6x^2 - 10x - 4$<br>$\checkmark x = 2 \quad \text{or} \quad x \neq -\frac{1}{3}$<br>$\checkmark y = -9$<br>$\checkmark A(2; -9)$ | (5) |
| 8.2 | $f'(x) = 6x^2 - 10x - 4$<br>$f''(x) = 0$<br>$12x - 10 = 0$<br>$x = \frac{5}{6}$                                                                                                                                                           | $\checkmark 12x - 10 = 0$<br>$\checkmark \text{answer/antwoord}$                                                                                                                                | (2) |
| 8.3 |                                                                                                                                                         | $\checkmark \text{shape/vorm2}$<br>$\checkmark \text{intercepts / onderskep}$                                                                                                                   | (2) |
| 8.4 | $-\frac{1}{3} \leq x \leq 2$                                                                                                                                                                                                              | $\checkmark \checkmark \text{answer/antwoord}$                                                                                                                                                  | (2) |

|     |                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                |     |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 8.5 | $PQ = 3x + 1 - (2x^3 - 5x^2 - 4x + 3)$<br>$= 3x + 1 - 2x^3 + 5x^2 + 4x - 3$<br>$= -2x^3 + 5x^2 + 7x - 2$<br>$PQ'(x) = 0$<br>$-6x^2 + 10x + 7 = 0$<br>$6x^2 - 10x - 7 = 0$<br>$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(6)(-7)}}{12}$<br>$x = 2,2 \quad \text{or} \quad x \neq -0,53$ | $\checkmark PQ = 3x + 1 - (2x^3 - 5x^2 - 4x + 3)$<br><br>$\checkmark PQ'(x) = -6x^2 + 10x + 7$<br><br>$\checkmark x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(6)(-7)}}{12}$<br>$\checkmark x = 2,2$ | (4) |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|

**QUESTION 9/ VRAAG 9**

|     |                                                                                                                                  |                                                                                                                                      |     |
|-----|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|
| 9.1 | $V(x) = x(40 - 2x)(60 - 2x)$<br>$= x(2400 - 120x - 80x + 4x^2)$<br>$= 4x^3 - 200x^2 + 2400x$                                     | $\checkmark x(40 - 2x)(60 - 2x)$<br>$\checkmark$ simplification/<br><i>vereenvoudig</i>                                              | (2) |
| 9.2 | $V'(x) = 12x^2 - 400x + 2400$<br>$12x^2 - 400x + 2400 = 0$<br>$x = 25,49 \quad \text{or} \quad x = 7,85$<br>maximum : $x = 7,85$ | $\checkmark 12x^2 - 400x + 2400$<br>$\checkmark V'(x) = 0$<br>$\checkmark x - \text{values/waardes}$<br>$\checkmark$ answer/antwoord | (4) |

**QUESTION 10/ VRAAG 10**

|      |        |                                                                                                                                                                                                                                                              |                                                                                                                                        |     |
|------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----|
| 10.1 |        | <p>Choosing between motorcycle and a bicycle are mutually exclusive events<br/>i.e. <math>P(M \text{ and } B) = 0</math></p> <p><math>P(M \text{ or } B) = P(M) + P(B)</math><br/> <math>= 0,44 + 0,55</math><br/> <math>= 0,99</math></p>                   | <p>✓ <math>P(M \text{ and } B) = 0</math></p> <p>✓ answer/antwoord</p>                                                                 | (2) |
| 10.2 | 10.2.1 | $P(EM) = 0,35$                                                                                                                                                                                                                                               | ✓ answer/antwoord                                                                                                                      | (1) |
|      | 10.2.2 | $P(SB) = 0,75$                                                                                                                                                                                                                                               | ✓ answer/antwoord                                                                                                                      | (1) |
|      | 10.2.3 | <p><math>P(EM \text{ and } SB) = P(EM) \times P(SB)</math><br/> <math>0,2 = 0,35 \times 0,75</math><br/> <math>0,2 = 0,26</math><br/> <math>0,2 \neq 0,3</math></p> <p>Therefore, classmate excellence in Maths is NOT independent of being a bystander.</p> | <p>✓ substitution/vervangings</p> <p>✓ <math>0,2 \neq 0,3</math></p> <p>✓ reasoning/redenasie</p>                                      | (3) |
| 10.3 | 10.3.1 | <p><math>= \frac{11!}{2! \times 3! \times 2!}</math></p> <p><math>= 1\,663\,200</math></p>                                                                                                                                                                   | <p>✓ <math>\frac{11!}{2! \times 3! \times 2!}</math></p> <p>✓ answer/antwoord</p>                                                      | (2) |
|      | 10.3.2 | <p><math>= 2 \left( \frac{9!}{3! \times 2!} \right) + \frac{9!}{2! \times 2!}</math></p> <p><math>= 60\,480 + 90\,720</math></p> <p><math>= 151\,200</math></p>                                                                                              | <p>✓✓ <math>2 \left( \frac{9!}{3! \times 2!} \right)</math></p> <p>✓ <math>\frac{9!}{2! \times 2!}</math></p> <p>✓ answer/antwoord</p> | (4) |
| 10.4 |        | <p><math>= 11 \times 10 \times 9 \times 27 \times 26</math></p> <p><math>= 694\,980</math></p>                                                                                                                                                               | <p>✓ <math>11 \times 10 \times 9</math></p> <p>✓ <math>27 \times 26</math></p> <p>✓ answer/antwoord</p>                                | (3) |