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**NATIONAL
SENIOR CERTIFICATE /
NASIONALE
SENIORSERTIFIKAAT**

GRADE/GRAAD 12

SEPTEMBER 2024

**TECHNICAL MATHEMATICS P1/
TEGNIJSE WISKUNDE V1
MARKING GUIDELINE/NASIENRIGLYN**

MARKS/ PUNTE: 150

MARKING CODES/NASIENKODES	
A	Accuracy/Akkuraatheid
CA	Consistent accuracy/Volgehoue akkuraatheid
M	Method/Metode
R	Rounding/Afronding
NPR	No penalty for rounding/Geen penalisering vir afronding nie
NPU	No penalty for units omitted Geen penalisering vir eenhede weggelaat nie
S	Simplification/Vereenvoudiging
SF	Substitution in correct formula/Vervanging in korrekte formule

This marking guideline consist of 14 pages./
Hierdie nasienriglyn bestaan uit 14 bladsye.



NOTE:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- The method of consistent accuracy marking must be applied to all aspects of the marking guideline where applicable as indicated with the marking code **CA**.
- If a candidate strikes off a response to a question and does not attempt the question again, then the struck off question should be marked.

LET WEL:

- *Indien 'n kandidaat 'n vraag twee keer beantwoord, merk slegs die EERSTE poging.*
- *Die metode van volgehou akkuraatheidnasien moet toegepas word op alle aspekte van die nasienriglyn waar van toepassing soos aangedui met die nasiekode **CA**.*
- *Indien 'n kandidaat 'n antwoord op 'n vraag deurhaal en nie poog om die vraag nie, moet die vraag wat deur gehaal is, gemerk word.*

QUESTION/ VRAAG 1			
1.1.1	$-x(x+9)=0$ $x=0$ or $x=-9$	$\checkmark x=0$ A $\checkmark x=-9$ A (2)	
1.1.2	$x-\frac{2}{x}=0$ $x^2-2=0$ $x=\frac{-0\pm\sqrt{0^2-4(1)(-2)}}{2(1)}$ $x=\pm1,4$ OR/OF $x-\frac{2}{x}=0$ $x^2-2=0$ $x^2=2$ $x=\pm\sqrt{2}$ $x=\pm1,4$	$\checkmark$ Standard form/ <i>standaardvorm</i> A $\checkmark$ Substitution/ <i>vervanging</i> CA $\checkmark x=\pm1,4$ CA OF/OF $\checkmark$ Standard form/ <i>standaardvorm</i> $\checkmark$ Square Root (3)	
1.1.3	$2x^2+7\leq9x$ $2x^2-9x+7\leq0$ CVs/ <i>KWs</i> : $(x-1)(2x-7)=0$ or/of $x=\frac{-(-9)\pm\sqrt{(-9)^2-4(2)(7)}}{2(2)}$ $x=1$ and/en $x=\frac{7}{2}$ $1\leq x\leq\frac{7}{2}$	$\checkmark$ Standard form/ <i>standaardvorm</i> A $\checkmark$ Factorisation/ <i>Faktorisering</i> SF CA $\checkmark$ Both critical values/ <i>beide kritiese waardes</i> CA $\checkmark$ Correct notation / <i>korrekte notasie</i> A (4)	



1.2	$2x + 6y = -12 \dots\dots\dots(1)$ $-2xy + 4y^2 - 10 = 0 \dots\dots\dots(2)$ $x = -3y - 6 \dots\dots\dots(3)$ Substitute (3) into (2) <i>Vervang (3) in (2)</i> $-2(-3y - 6)y + 4y^2 - 10 = 0$ $6y^2 + 12y + 4y^2 - 10 = 0$ $10y^2 + 12y - 10 = 0$ $y = \frac{-(12) \pm \sqrt{(12)^2 - 4(10)(-10)}}{2(10)}$ $y = 0,57 \text{ or/of } y = -1,77$ Then/ <i>dan</i> : $x = -7,71 \text{ or/of } x = -0,69$ OR/OF $2x + 6y = -12 \dots\dots\dots(1)$ $-2xy + 4y^2 - 10 = 0 \dots\dots\dots(2)$ $y = -\frac{x}{3} - 2 \dots\dots\dots(3)$ Substitute (3) into (2): <i>Vervang (3) in (2)</i> $-2x\left(-\frac{x}{3} - 2\right) + 4\left(-\frac{x}{3} - 2\right)^2 - 10 = 0$ $\frac{2}{3}x^2 + 4x + 4\left(\frac{1}{9}x^2 + \frac{4}{3}x + 4\right) - 10 = 0$ $\frac{2}{3}x^2 + 4x + \frac{4}{9}x^2 + \frac{16}{3}x + 16 - 10 = 0$ $10x^2 + 84x + 54 = 0$ $x = \frac{-(84) \pm \sqrt{(84)^2 - 4(10)(54)}}{2(10)}$ $x = -0,70 \text{ or/of } x = -7,70$ $y = -\frac{(-0,70)}{3} - 2 \text{ and/en } y = -\frac{(-7,70)}{3} - 2$ $y = -1,77 \text{ and/en } y = 0,57$	✓ Equation/ <i>Vergelyking</i> (3) A ✓ Substitution/ <i>vervang</i> CA ✓ Correct standard form/ <i>korrekte standaardvorm</i> CA ✓ Factors/ <i>faktore</i> CA ✓ Both y-values/ <i>beide y-waardes</i> CA ✓ Both x-values/ <i>beide x-waardes</i> CA OR/OF ✓ Equation/ <i>Vergelyking</i> (3) A ✓ Substitution/ <i>vervang</i> CA ✓ Correct standard form/ <i>korrekte standaardvorm</i> CA ✓ Factors/Substitution/ <i>Faktore /Vervanging</i> CA ✓ Both x-values/ <i>beide x-waardes</i> CA ✓ Both y-values/ <i>beide y-waardes</i> CA NPR (6)
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1.3.1	$W = \frac{1}{2} kx^2$ $2W = kx^2$ $x^2 = \frac{2W}{k}$ $\therefore x = \sqrt{\frac{2W}{k}}$	$\checkmark x^2 = \frac{2W}{k} \quad \text{A}$ $\checkmark x = \sqrt{\frac{2W}{k}} \quad \text{CA}$ (2)																					
1.3.2	$250 = \frac{1}{2} (200) x^2$ $x^2 = \frac{250 \times 2}{200}$ $x = \sqrt{\frac{500}{200}}$ $x = 1,58 \text{ m}$ $x = \sqrt{\frac{2W}{K}}$ OR/OF $x = \sqrt{\frac{2 \times 250}{200}}$ $x = 1,58 \text{ m}$	$\checkmark \text{ Substitution/vervanging CA}$ $\checkmark x = 1,58 \text{ m} \quad \text{CA}$ NPU (2)																					
1.3.3	$1,58 \times 10^0$	$\checkmark 1,58 \times 10^0 \quad \text{CA}$ (1)																					
1.4.1	30	$\checkmark 30 \quad \text{A}$ (1)																					
1.4.2	<table border="1"> <thead> <tr> <th></th><th>30</th><th>Remain/Res</th></tr> </thead> <tbody> <tr> <td>2</td><td>15</td><td>0</td></tr> <tr> <td>2</td><td>7</td><td>1</td></tr> <tr> <td>2</td><td>3</td><td>1</td></tr> <tr> <td>2</td><td>1</td><td>1</td></tr> <tr> <td>2</td><td>0</td><td>1</td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table> $30 = 11110_2$		30	Remain/Res	2	15	0	2	7	1	2	3	1	2	1	1	2	0	1				$\checkmark \text{ Method/metode CA}$ $\checkmark \text{ Answer/antwoord CA}$ (2) AO: 2 Marks/ Punte
	30	Remain/Res																					
2	15	0																					
2	7	1																					
2	3	1																					
2	1	1																					
2	0	1																					
		[23]																					

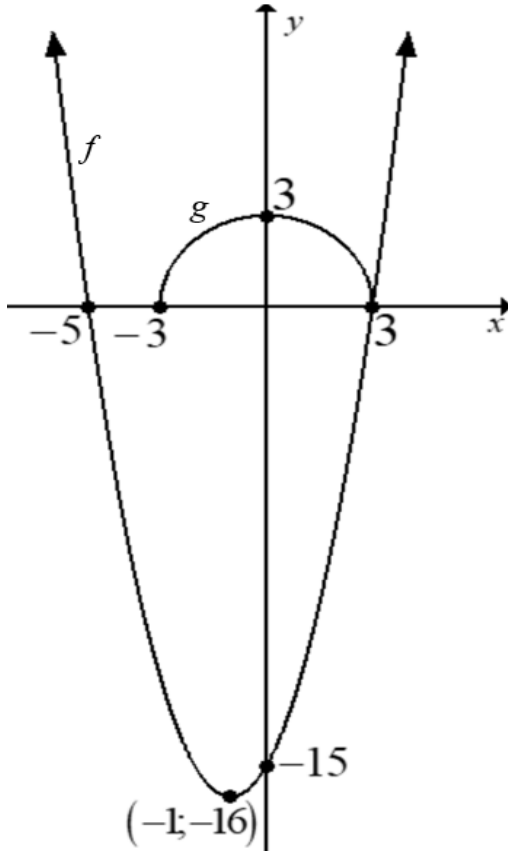


QUESTION / VRAAG 2			
2.1.1	$x + 9 = 0$ $x = -9$ AO: 2 Marks/ Punte	$\checkmark x + 9 = 0$ $\checkmark$ Answer/antwoord (2)	A CA
2.1.2	$-x + 3 < 0$ $x > 3$ AO: 2 Marks / Punte	$\checkmark -x + 3 < 0$ $\checkmark x > 3$ (2)	A CA
2.2	$b^2 - 4ac > 0$ $(2q)^2 - 4(-3)(-1) > 0$ $4q^2 - 12 > 0$ $q^2 > 3$ $q > \pm\sqrt{3}$ $\therefore q > \sqrt{3}$	$\checkmark \Delta > 0$ $\checkmark$ Substitution/Vervanging $\checkmark q > \sqrt{3}$ (3)	A A CA
			[7]
QUESTION / VRAAG 3			
3.1.1	$= \log_2 2^6$ $= 6 \log_2 2$ $= 6$ AO: NO MARK / GEEN PUNTE	$\checkmark \log_2 2^6$ $\checkmark$ Answer/antwoord (2)	A CA
3.1.2	$= \frac{2^{3x-3} \cdot 3^{-x-1}}{\left(\frac{1}{2^2}\right)^{-x} \cdot 2^{x-3} \cdot 3^{x-3} \cdot (3^2)^{-x+1}}$ $= \frac{2^{3x-3} \cdot 3^{-x-1}}{2^{2x} \cdot 2^{x-3} \cdot 3^{x-3} \cdot 3^{-2x+2}}$ $= 2^{3x-3-2x-x+3} \cdot 3^{-x-1-x+3+2x-2}$ $= 2^0 \cdot 3^0$ $= 1$	$\checkmark$ Prime factors/priemfaktore $\checkmark$ Simplification/vereenvoudiging $\checkmark$ Same base rule/dieselfde basis reël $\checkmark$ Simplification/vereenvoudiging $\checkmark 1$ (5)	A CA CA CA



3.1.3	$\frac{\sqrt{9 \times 7} - 2\sqrt{16 \times 7}}{\sqrt{4 \times 7}} \quad \text{OR / OF} \quad \frac{\sqrt{3^2 \times 7} - 2\sqrt{2^2 \times 7}}{\sqrt{2^2 \times 7}}$ $= \frac{3\sqrt{7} - 8\sqrt{7}}{2\sqrt{7}} \quad \text{OR / OF} \quad \frac{\sqrt{7}(3-8)}{2\sqrt{7}}$ $= \frac{-5\sqrt{7}}{2\sqrt{7}}$ $= -\frac{5}{2}$	✓ Factors/ <i>Faktore</i> A ✓ S CA ✓ $-\frac{5}{2}$ CA (3)
3.2	$\log_2(x+1)(x-1) = 3$ $x^2 - 1 = 2^3$ $x^2 - 9 = 0$ $(x+3)(x-3) = 0$ $x = -3 \text{ or/of } x = 3$ $\therefore x = 3$	✓ Log property/ <i>eienskap</i> A ✓ Standard form / <i>standaardvorm</i> CA ✓ Factors/ <i>Faktore</i> /Substitution / <i>Vervanging</i> CA ✓ $x = 3$ CA (4)
3.3.1	$\frac{\pi}{3} \times \frac{180}{\pi} = 60^\circ$	✓ 60° A (1)
3.3.2	$z = 2\cos 60^\circ$ $z = 2\cos 60^\circ + i\sin 60^\circ$ $= 2\left(\frac{1}{2} + \frac{\sqrt{3}}{2}i\right)$ $z = 1 + \sqrt{3}i$	✓ $\frac{1}{2}$ CA ✓ $\frac{\sqrt{3}}{2}$ CA ✓ $z = 1 + \sqrt{3}i$ CA (3)
3.4	$p + 2qi - 3qi^2 = 5 - 14i$ $p + 2qi - 3q(-1) = 5 - 14i$ $p + 2qi + 3q = 5 - 14i$ $2qi = -14i$ $q = -7$ $p + 3q = 5$ $p + 3(-7) = 5$ $p = 26$	✓ Expand/ <i>Brei uit</i> A ✓ $i^2 = -1$ CA ✓ Equating/ <i>gelykstelling</i> CA ✓ $q = -7$ CA ✓ $p = 26$ CA (5)
		[23]



QUESTION / VRAAG 4				
4.1.1	$(-1; -16)$	$\checkmark x = -1$ $\checkmark y = -16$	A A (2)	
4.1.2	$x^2 + 2x - 15 = 0$ $(x + 5)(x - 3) = 0$ $x = -5$ or/of $x = 3$	$\checkmark$ Standard form/ <i>standaardvorm</i> $\checkmark$ Factors/ <i>Faktore</i> /Substitution <i>/Vervanging</i> $\checkmark$ Both x -values/ <i>Beide x-</i> <i>waardes</i>	A CA CA (3)	
4.1.3	Range/ <i>Waardevers</i> : $0 \leq y \leq 3$ OR/OF $y \in [0 ; 3]$	$\checkmark$ Correct notation/ <i>Korrekte</i> <i>notasie</i> $\checkmark$ Critical values/ <i>Kritiese</i> <i>waardes</i>	A A (2)	
4.1.4		$f(x)$: $\checkmark$ x -intercepts/ <i>afsnitte</i> $\checkmark$ y -intercept/ <i>afsnit</i> $\checkmark$ Turning points/ <i>draaipunte</i> $\checkmark$ Shape/ <i>vorm</i> $g(x)$: $\checkmark$ Intercepts / <i>afsnitte</i> $\checkmark$ Shape / <i>vorm</i>	CA CA CA CA CA CA (6)	



4.1.5	$x > -1$	✓ Critical value/ <i>Kritiese waardes</i> ✓ Notation/ <i>notasie</i>	CA A (2)
4.2.1	$(4 ; 0)$	✓ $y = 0$ ✓ $x = 4$	A A (2)
4.2.2	$x + p = 0$ $1 + p = 0$ $p = -1$ $q = 2$	✓ $p = -1$ ✓ $q = 2$	A A (2)
4.2.3	$k(x) = \frac{m}{x-1} + 2$ $0 = \frac{m}{-4-1} + 2$ $-2 = \frac{m}{-5}$ $m = 10$	✓ Substitution/ <i>vervanging</i> ✓ Simplification/ <i>vereenvoudiging</i> ✓ $m = 10$	A CA CA (3)
4.2.4	$f(x) = g(x)$ $\frac{10}{x-1} + 2 = 2x - 8$ $\frac{10}{x-1} = 2x - 10$ $(x-1)(2x-10) = 10$ $x^2 - 12x + 10 - 10 = 0$ $x^2 - 12x = 0$ $x(x - 12) = 0$ $x = 0$ or/ <i>of</i> $x = 12$	✓ Equating/ <i>gelykstelling</i> ✓ Simplification / <i>vereenvoudiging</i> ✓ Standard form/ <i>standaardvorm</i> ✓ Factors/ <i>Faktore</i> ✓ $x = 0$ ✓ $x = 12$	A CA A CA CA (5)



4.3	$y = a^x + 1$ $4 = a^{-1} + 1$ $3 = \frac{1}{a}$ $a = 3^{-1}$ $\therefore y = 3^{-x} + 1$ OR/OF $y = \left(\frac{1}{3}\right)^x + 1$	$\checkmark q = 1$ A $\checkmark$ Substitution/ <i>vervang</i> A $\checkmark y = 3^{-x} + 1$ CA (3)
		[29]
QUESTION / VRAAG 5		
5.1	$i_{eff} = \left(1 + \frac{i_{nom}}{m}\right)^m - 1$ $0,0913 = \left(1 + \frac{i}{4}\right)^4 - 1$ $i_{nom} = \left(\sqrt[4]{1 + 0,0913} - 1\right) \times 4$ $i_{nom} = 0,088330$ $Rate_{nom} = 8,83\%$	$\checkmark$ Substitution/ <i>vervang</i> A $\checkmark$ Simplification/ <i>vereenvoudig</i> CA $\checkmark$ Rate/ <i>Koers</i> _{nom} = 8,83% CA AO: 1 MARK/PUNT (3)
5.2.1	Deposit/ <i>Deposito</i> = $\frac{20}{100} \times R24\ 000$ Balance/ <i>Balans</i> = $R24\ 000 - R4\ 800$ = R19 200 Interest over 24 months/ <i>Rente oor 24 maande</i> A = $R19\ 200 (1 + 0,12 \times 2)$ A = R23 808 = $\frac{23\ 808}{24}$ Monthly installments/ Maandelikse paalement = R992	$\checkmark$ R4 800 A $\checkmark$ R19 200 CA $\checkmark$ Correct formula/ <i>korrekte formule</i> A $\checkmark$ R23 808 CA $\checkmark$ R992 CA (5)
5.2.2	Total amount owed/ = R23 808 + R992 Totale bedrag verskuldig = R24 800	$\checkmark$ R24 800 CA (1)



5.3	$A = P(1+i)^n$ $6000 = 3000(1+i)^6$ $2 = (1+i)^6$ $1+i = \sqrt[6]{2}$ $i = \sqrt[6]{2} - 1$ Rate/Koers = 12,25%	✓ Substitution/vervanging A ✓ $1+i$ subject/onderwerp CA ✓ 12, 25% A
5.4	$A = P(1+i)^n$ $R155\ 000 = Rx \left(1 + \frac{0,12}{2}\right)^{2 \times 5} \left(1 + \frac{0,132}{12}\right)^{12 \times 5}$ $+ R15\ 000 \left(1 + \frac{0,12}{2}\right)^{1 \times 2} \left(1 + \frac{0,132}{12}\right)^{5 \times 12}$ $155\ 000 - R15\ 000 \left(1 + \frac{0,12}{2}\right)^2 \left(1 + \frac{0,132}{12}\right)^{60} = Rx \left(1 + \frac{0,12}{2}\right)^{10} \left(1 + \frac{0,132}{12}\right)^{60}$ $Rx = \frac{155\ 000 - R15\ 000 \left(1 + \frac{0,12}{2}\right)^2 \left(1 + \frac{0,132}{12}\right)^{60}}{\left(1 + \frac{0,12}{2}\right)^{10} \left(1 + \frac{0,132}{12}\right)^{60}}$ $Rx = R35\ 484,41$	✓ $\left(1 + \frac{0,12}{2}\right)^{2 \times 5} \left(1 + \frac{0,132}{12}\right)^{12 \times 5}$ A ✓ +R15 000 A ✓ $\left(1 + \frac{0,12}{2}\right)^{1 \times 2}$ A ✓ Simplification/ Vereenvoudiging CA ✓ $Rx = R35\ 484,41$ CA (5)
		[17]

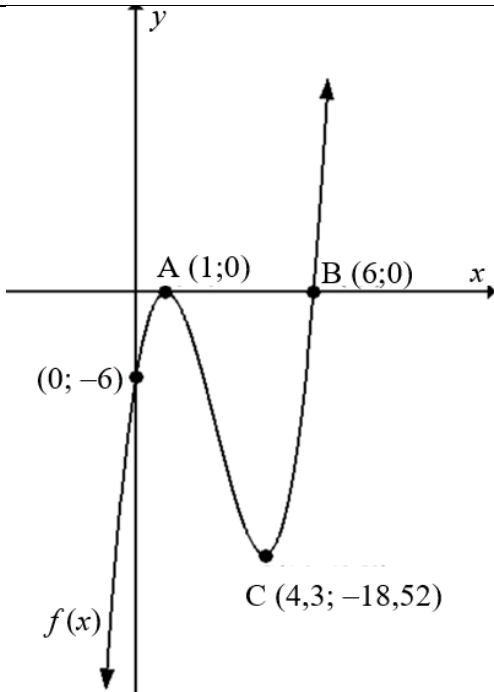


QUESTION / <i>VRAAG 6</i>		
6.1	$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{-\frac{1}{3}(x+h) - 4 - \left(-\frac{1}{3}x - 4\right)}{h}$ $= \lim_{h \rightarrow 0} \frac{-\frac{1}{3}x - \frac{1}{3}h - 4 + \frac{1}{3}x + 4}{h}$ $= \lim_{h \rightarrow 0} \frac{-\frac{1}{3}h}{h}$ $= \lim_{h \rightarrow 0} -\frac{1}{3}$ $f'(x) = -\frac{1}{3}$	✓ Definition/<i>Definisie</i> A ✓ Substitution/<i>Vervanging</i> A ✓ Simplification/ <i>vereenvoudiging</i> CA ✓ Further simplification/ <i>verdere vereenvoudiging</i> CA ✓ $f'(x) = -\frac{1}{3}$ CA (5)
6.2.1	$D_x \left[x^5 + \frac{1}{2}x^{-6} - x^{-1} \right]$ $= 5x^4 - 3x^{-7} + x^{-2}$	✓ $\frac{1}{2}x^{-6}$ A ✓ $-x^{-1}$ A ✓ $5x^4$ CA ✓ $-3x^7$ CA ✓ x^{-2} CA (5)
6.2.2	$f(x) = ax^4 + 2x^{\frac{1}{3}}$ $f'(x) = 4ax^3 + \frac{2}{3}x^{-\frac{2}{3}}$	✓ $2x^{\frac{1}{3}}$ A ✓ $4ax^3$ A ✓ $\frac{2}{3}x^{-\frac{2}{3}}$ CA (3)
6.3	$f(x) = kx^2 - 4x + 5$ $f'(x) = 2kx - 4$ $16 = 2k(-2) - 4$ $16 + 4 = -4k$ $k = -5$	✓ Derivative/<i>afgeleide</i> A ✓ Substitution/<i>vervanging</i> CA ✓ $k = -5$ CA (3)
		[16]



QUESTION / VRAAG 7		
7.1	$f(x) = x^3 - 7x^2 + 6x - x^2 + 7x - 6$ $f(x) = x^3 - 8x^2 + 13x - 6$	$\checkmark f(x) = x^3 - 8x^2 + 13x - 6$ A (1)
7.2	$f(x) = (x - 1)(x - 1)(x - 6)$ $(x - 1)(x - 1)(x - 6) = 0$ $x = 1$ or/of $x = 6$ OR/OF $(x - 1)$ or/of $x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(1)(6)}}{2(1)}$ $x = 1$ or/of $x = 6$	$\checkmark$ Factors/ <i>faktore</i> A $\checkmark x = 1$ CA $\checkmark x = 6$ CA OR/ OF $\checkmark$ Substitution/ <i>vervanging</i> A $\checkmark x = 1$ CA $\checkmark x = 6$ CA (3)
7.3	$f'(x) = 3x^2 - 16x + 13$ let/ <i>laat</i> $f'(x) = 0$ $3x^2 - 16x + 13 = 0$ $x = \frac{-(-16) \pm \sqrt{(-16)^2 - 4(3)(13)}}{2(3)}$ $x = \frac{13}{3}$ or/of $x = 1$ $y = (1)^3 - 7(1)^2 + 6(1) - 6$ $y = 0$ $y = \left(\frac{13}{3}\right)^3 - 7\left(\frac{13}{3}\right)^2 + 6\left(\frac{13}{3}\right) - 6$ $y = -18,52$	$\checkmark$ Derivative/ <i>afgeleide</i> A $\checkmark$ Derivate/ <i>Afgeleide</i> = 0 A $\checkmark$ Factors/ <i>Faktore</i> Substitution / <i>Vervanging</i> CA $\checkmark$ Both x values/ <i>Beide</i> x -waardes CA $\checkmark$ Both y values/ <i>Beide</i> y -waardes CA (5)



7.4		✓ x -intercepts/ <i>afsnitte</i> CA ✓ y -intercept/ <i>afsnit</i> CA ✓ Turning points/ <i>draaipunte</i> CA ✓ Shape/ <i>vorm</i> CA
		(4)
7.5	$x = 1$ or/of $x \geq 6$	✓ $x = 1$ A ✓ $x \geq 6$ A
		(2)
		[15]
QUESTION / VRAAG 8		
8.1	$h(0) = -2(0)^2 + 9,2(0) + 2$ $= 2 \text{ } ^\circ\text{C}$	✓ $2 \text{ } ^\circ\text{C}$ A
		(1)
8.2	$\frac{d(T)}{dt} = -4t + 9,2$ $= -4(3) + 9,2$ $= -2,8 \text{ } ^\circ\text{C}$	✓ Derivative/ <i>Afgeleide</i> A ✓ Substitution/ <i>vervang</i> CA ✓ $-2,8 \text{ } ^\circ\text{C}$ CA
		(3)
8.3	Let/Laat $\frac{d(T)}{dt} = 0$ $-4t + 9,2 = 0$ $t = \frac{9,2}{4}$ $t = 2,3 \text{ seconds/sekondes}$	✓ Derivative/ <i>Afgeleide</i> = 0 A ✓ $t = 2,3 \text{ sec/sek}$ CA
		(2)
8.4	$T(2,3) = 12,58 \text{ } ^\circ\text{C}$	✓ $T(2,3) = 12,58 \text{ } ^\circ\text{C}$ CA
		(1)
		[7]



QUESTION / <i>VRAAG 9</i>			
9.1.1	$\int -4^{2t} dt = \frac{-4^{2t}}{2\ln 2} + c$	$\checkmark \frac{-4^{2t}}{2\ln 2}$ $\checkmark c$	A A (2)
9.1.2	$= \int 2 + \frac{3}{x} dx$ $= 2x + 3\ln x + c$	$\checkmark 2$ $\checkmark \frac{3}{x}$ $\checkmark 2x$ $\checkmark 3\ln x$	A A CA CA (4)
9.2	$A = \int x^2 - 6x + 5 dx$ $A_1 = \int_0^1 x^2 - 6x + 5 dx$ $= \left[\frac{1}{3}x^3 - 3x^2 + 5x \right]_0^1$ $= \left[\frac{1}{3}(1)^3 - 3(1)^2 + 5(1) \right] - \left[\frac{1}{3}(0)^3 - 3(0)^2 + 5(0) \right]$ $= \frac{7}{3}$ $A_2 = - \left[\frac{1}{3}x^3 - 3x^2 + 5x \right]_1^3$ $= - \left[\frac{1}{3}(3)^3 - 3(3)^2 + 5(3) \right] - \left[\frac{1}{3}(1)^3 - 3(1)^2 + 5(1) \right]$ $= - \left(-3 - \frac{7}{3} \right)$ $= \frac{16}{3}$ $A_{total} = A_1 + A_2$ $= \frac{7}{3} + \frac{16}{3}$ $= \frac{23}{3} \text{ unit}^2 / \text{eenhede}^2$	$\checkmark$ Area notation/ <i>notasie</i> $\checkmark$ Integral/ <i>integraal</i> $\checkmark$ Substitution/ <i>vervang</i> $\checkmark \frac{7}{3}$ $\checkmark$ Substitution by 1&3/ <i>Vervang deur 1 & 3</i> $\checkmark \frac{16}{3}$ $\checkmark \frac{23}{3}$	A A CA CA CA CA CA (7) [13]
		TOTAL/ TOTAAL: 150	

