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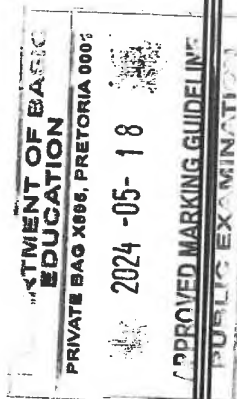


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**SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS
SENIORSERTIFIKAAT-EKSAMEN/
NASIONALE SENIORSERTIFIKAAT-EKSAMEN**

TECHNICAL MATHEMATICS P1/TEGNIESE WISKUNDE VI


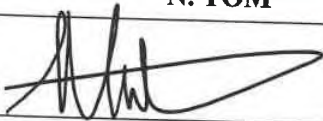

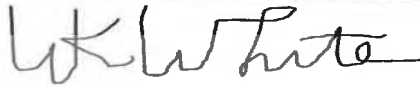
MAY/JUNE/MEI/JUNIE 2024

FINAL/FINALE MARKING GUIDELINES/NASIENRIGLYNE

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 Penaliserings vir Afronding nie
NPU	No Penalty for Units omitted/Geen Penaliserings vir Eenhede Weggelaat nie
S	Simplification/Vereenvoudiging
SF	Substitution in Correct Formula/Vervanging in Korrekte Formule

**These marking guidelines consist of 19 pages.
Hierdie nasienriglyne bestaan uit 19 bladsye.**

DATE APPROVED/DATUM GOEDGEKEUR	11 MAY 2024
EXTERNAL/EKSTERNE MODERATOR	INTERNAL //INTERNE MODERATORS
M.A. HENDRICKS	N. TOM
	
	W. WHITE
	

NOTE:

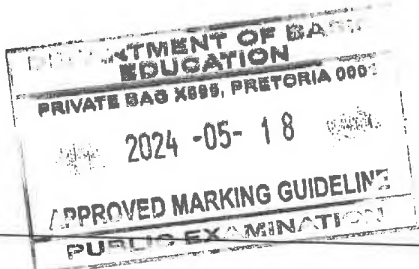
- If a candidate answers a question TWICE, mark only the FIRST attempt.
- Consistent accuracy applies in all aspects of the marking guidelines where indicated.
- # Shows questions where a Tolerance Range will be applied:
Q 2.2 ; Q 5.2.1 ; Q 6.1 & Q 9.2

LET WEL:

- Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.
- Volgehoue akkuraatheid is deurgaans op alle aspekte van die nasienriglyne soos aangedui.
- # Toon vrae waar Toleransie wydte (Verdraagsaamheids omvang) toegepas word:
V 2.2 ; V 5.2. ; V 6.1 & V 9.2

QUESTION/VRAAG 1

1.1.1	$x^2 - x - 12 = 0$ $(x - 4)(x + 3) = 0$ OR/OF $x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(-12)}}{2(1)}$ $x = 4$ or/of $x = -3$	✓ factors/formula faktore/formule ✓ both values of x beide waardes van x AO: Full Marks/Volpunte	A CA (2)
1.1.2	$x^2 - x - 12 \leq 0$ $(x - 4)(x + 3) \leq 0$ $-3 \leq x \leq 4$ OR/OF $x \in [-3 ; 4]$	✓ correct notation korrekte notasie ADDENDUM	CA (1)
1.1.3	$x^2 - x - 12 = -5$ $x^2 - x - 7 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $= \frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(-7)}}{2(1)}$ $x \approx -2,19$ or/of $x \approx 3,19$	✓ standard form /standaardvorm ✓ SF ✓ positive x -value Positiewe x -waarde ✓ negative value of x negatiewe waarde v x NPR AO: Full Marks/Volpunte	A CA CA CA (4)



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1.3.1	$T = \frac{12,5 D}{D + 4d}$ $T(D + 4d) = 12,5 D$ $(D + 4d) = \frac{12,5 D}{T}$ $d = \frac{\frac{12,5 D}{T} - D}{4} \quad \text{OR/OF} \quad d = \frac{12,5D}{4T} - \frac{D}{4}$ $\text{OR/OF} \quad d = \frac{12,5D - DT}{4T}$	<p>✓ multiplication/ vermenigvuldiging</p> <p>✓ division/ deling</p> <p>✓ subtraction and division/ aftrekking en deling</p>	<p>A</p> <p>A</p> <p>CA</p>
1.3.2	$d = \frac{\frac{12,5 D}{T} - D}{4}$ $= \frac{\frac{12,5(32)}{(10)} - (32)}{4}$ $d = 2$ <p style="text-align: center;">OR/OF</p> $d = \frac{12,5D}{4T} - \frac{D}{4}$ $= \frac{12,5(32)}{4(10)} - \frac{32}{4}$ $d = 2$ <p style="text-align: center;">OR/OF</p> $d = \frac{12,5D - DT}{4T}$ $= \frac{12,5(32) - (32)(10)}{4(10)}$ $d = 2$ <p style="text-align: center;">OR/OF</p> $T = \frac{12,5 D}{D + 4d}$ $10 = \frac{12,5 \times 32}{32 + 4d}$ $d = 2$	<p>✓ SF</p> <p>✓ value of /waarde van d</p> <p style="text-align: center;">OR/OF</p> <p>✓ SF</p> <p>✓ value of /waarde van d</p> <p style="text-align: center;">OR/OF</p> <p>✓ SF</p> <p>✓ value of /waarde van d</p> <p style="text-align: center;">OR/OF</p> <p>✓ SF</p> <p>✓ value of /waarde van d</p>	<p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>A</p> <p>CA</p> <p>(2)</p>

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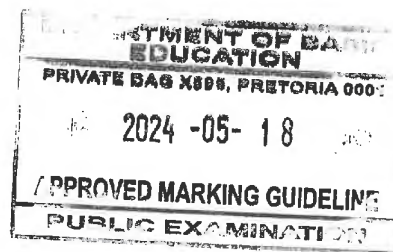


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1.4	111110 ₂																						
	<table border="1"> <tr> <td>2⁵</td> <td>2⁴</td> <td>2³</td> <td>2²</td> <td>2¹</td> <td>2⁰</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>32</td> <td>16</td> <td>8</td> <td>4</td> <td>2</td> <td>0</td> </tr> </table>	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰	1	1	1	1	1	0	32	16	8	4	2	0				
2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰																		
1	1	1	1	1	0																		
32	16	8	4	2	0																		
	$32 + 16 + 8 + 4 + 2 = 62$ $\therefore 2 (111110_2 + 38)$ $= 2 (62 + 38)$ $= 200$			✓ 62		A																	
				✓ 200		CA																	
				AO: Full Marks/Volpunte		(2)																	
						[20]																	



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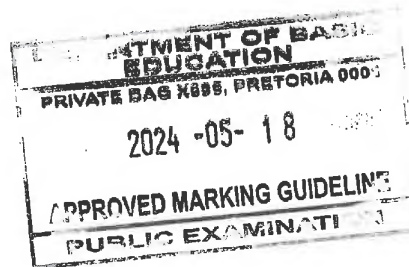
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QUESTION/VRAAG 2

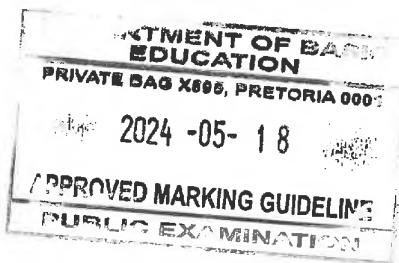
2.1.1	$b = 0$	✓ Value of/ waarde van b	A (1)
2.1.2	$b = \frac{2}{5}$ OR/OF 0,4	✓ Value of/ waarde van b	A (1)
2.2	$kx^2 = 35 - 2x$ # $kx^2 + 2x - 35 = 0$ $\Delta = b^2 - 4ac$ $= (2)^2 - 4(k)(-35)$ $= 4 + 140k$ For real roots / Vir reële wortels: $\Delta \geq 0$ $4 + 140k \geq 0$ $k \geq -\frac{1}{35}$ OR/OF $-0,03$	✓ standard form /standaardvorm ✓ SF ✓ S ✓ $\Delta \geq 0$ ✓ Values of /waardes van k ADDENDUM	A CA CA A CA (5)
			[7]



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3.3	$5^{x+2} - 5^x = 600$ $5^x \cdot 5^2 - 5^x = 600$ $5^x (25 - 1) = 600$ $5^x = 25$ $5^x = 5^2 \text{ OR/OF } x = \log_5 25 \text{ OR/OF } \log 5^x = \log 5^2$ $x \log 5 = 2 \log 5$ $\therefore x = 2$	<p>✓ separating exp./skei eksp.</p> <p>✓ factors / faktore</p> <p>✓ S</p> <p>✓ exp or log. prop./eksp. of log eienskap</p> <p>✓ value of /waarde van x</p> <p>AO: Full Marks/Volpunte</p>	<p>A</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>(5)</p>
3.4.1	$-i \text{ OR/OF } 0 - i$	<p>✓ conjugate /gekojugeerde</p>	<p>A</p> <p>(1)</p>
3.4.2	$\frac{2+3i}{i}$ $= \frac{2+3i}{i} \times \frac{-i}{-i}$ $= \frac{-2i-3i^2}{-i^2} \text{ OR / OF } -\frac{2i}{-i^2} + 3$ $= \frac{-2i-3(-1)}{-(-1)} \text{ OR / OF } -\frac{2i}{-(-1)} + 3$ $= -2i + 3$	<p>✓ M</p> <p>✓ S</p> <p>✓ -1</p> <p>✓ S</p> <p>ADDENDUM</p>	<p>A</p> <p>CA</p> <p>A</p> <p>CA</p> <p>(4)</p>
3.5	$a + bi = -i - 14$ $\therefore a = -14 \text{ and / en } b = -1$	<p>✓ a-value/waarde</p> <p>✓ b-value/waarde</p>	<p>A</p> <p>A</p> <p>(2)</p>
			<p>[22]</p>



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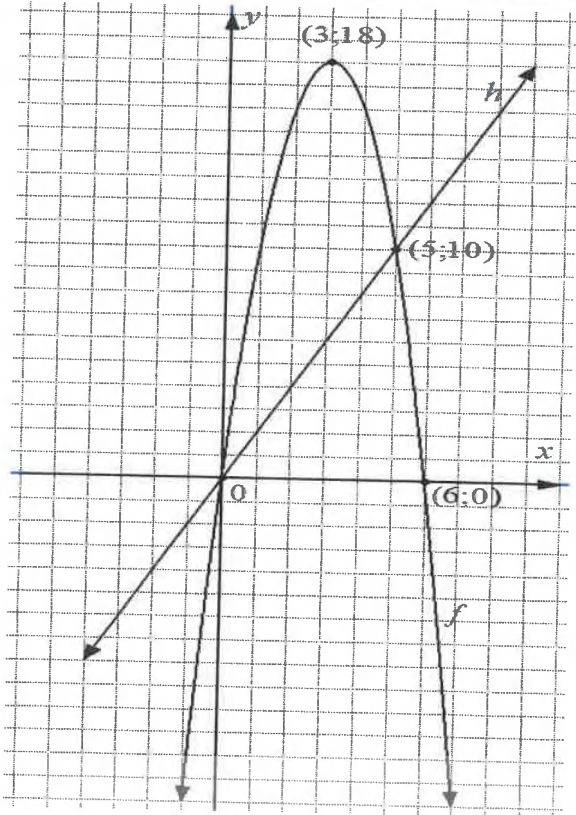
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QUESTION/VRAAG 4

4.1.1	(3;18)	<ul style="list-style-type: none"> ✓ 3 ✓ 18 	<p>A A (2)</p>
4.1.2	$-2(x-3)^2 + 18 = 0$ $-2(x^2 - 6x + 9) + 18 = 0$ $-2(x^2 - 6x + 9) + 18 = 0$ $-2x^2 + 12x = 0$ $-2x(x-6) = 0 \quad \text{OR/OF} \quad x = \frac{-(12) \pm \sqrt{(12)^2 - 4(-2)(0)}}{2(-2)}$ <p style="text-align: center;">$x = 0$ or / of $x = 6$</p> <p style="text-align: center;">OR/OF</p> $-2(x-3)^2 + 18 = 0$ $2(x-3)^2 = 18 \quad \text{OR/OF} \quad (x-3)^2 = 9$ $x - 3 = \pm 3$ $x = 0 \text{ or / of } x = 6$	<ul style="list-style-type: none"> ✓ = 0 ✓ Standard form standaard vorm ✓ factors/formula faktore/formule ✓ both values of x albei waardes van x <p style="text-align: center;">OR/OF</p> <ul style="list-style-type: none"> ✓ = 0 ✓ S ✓ S ✓ both x-values of /albei x-waardes 	<p>A CA CA CA CA CA (4)</p>
4.1.3 & 4.1.5		<p>4.1.3 f:</p> <ul style="list-style-type: none"> ✓ Turning point Draaipunt ✓ both x- int beide x-afsn. ✓ shape/vorm <p style="text-align: center;">ADDENDUM</p>	<p>CA CA CA (3)</p>
		<p>4.1.5 h:</p> <ul style="list-style-type: none"> ✓ x- int./afsn. & (5;10) ✓ increasing line/ toenemende lyn <p style="text-align: center;">ADDENDUM</p>	<p>CA CA (2)</p>

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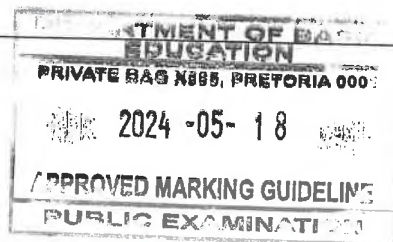
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4.1.4 (a)	$f(x) = -2(x-3)^2 + 18$ subst./verv. (5; t) $t = -2(5-3)^2 + 18$ $= 10$ OR/OF $f(x) = -2x^2 + 12x$ $t = -2(5)^2 + 12(5)$ $= 10$	✓ subst./verv ✓ value of /waarde van t OR/OF ✓ subst./verv ✓ value of /waarde van t AO: Full Marks/Volpunte	A CA CA CA (2)
4.1.4 (b)	$h(x) = 2x + c$ subst./verv (5; 10) $10 = 2(5) + c$ $c = 0$	✓ subst./verv ✓ c-value of /c-waarde	CA CA (2)
4.1.5	REFER TO DIAGRAM IN Q 4.1.3		
4.2.1 (a)	$x \in \square$; $x \neq 0$ OR/OF $x \in (-\infty; 0) \cup (0; \infty)$	✓ $x \neq 0$ OR/OF $x \in (-\infty; 0) \cup (0; \infty)$	A (1)
4.2.1 (b)	$y > -4$ OR/OF $y \in (-4; \infty)$	✓ Range/waarde versameling	A (1)
4.2.1 (c)	$q = -4$	✓ $q = -4$	A (1)
4.2.1 (d)	$D(0; -3)$	✓ $x = 0$ ✓ $y = -3$	A CA (2)
4.2.2	$0 = -\frac{8}{x} - 4$ $4 = -\frac{8}{x}$ $4x = -8$ $x = -2$ $C(-2; 0)$	✓ $y = 0$ ✓ S ✓ x-value /x-waarde AO: Full Marks/Volpunte	A CA CA (3)
4.2.3	$g(x) = a^x + q$ $g(x) = a^x - 4$ $0 = a^{-2} - 4$ subst./verv. (-2; 0) $4 = a^{-2}$ $a = \frac{1}{2}$	✓ subst./verv ✓ a-value /a-waarde	CA CA (2)



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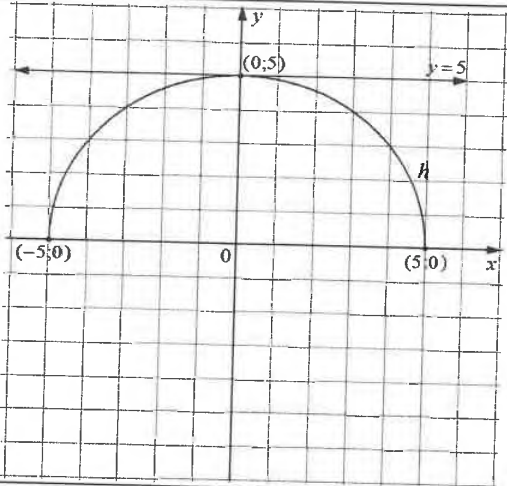


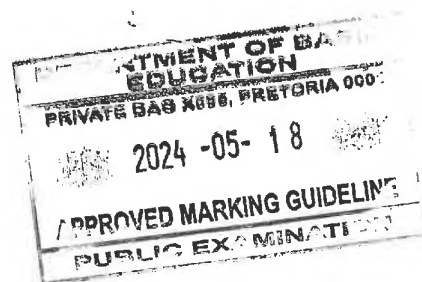
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4.3		<p><i>h</i>:</p> <ul style="list-style-type: none"> ✓ shape/vorm ✓ x-intercepts / afsnitte ✓ line/lyn $y = 5$ 	<p>A A CA (3)</p>
			[28]



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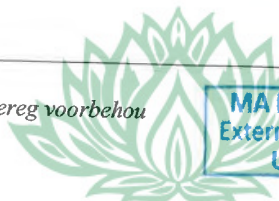
QUESTION/VRAAG 5

5.1.1	250	✓ 250	A (1)
5.1.2	$A = P(1 + i)^n$ $= 250(1 + 50\%)^{12}$ $\approx 32\,437$	✓ F ✓ SF ✓ S ADDENDUM	A CA CA (3)
5.1.3	$A = P(1 + i)^n$ $100\,000 = 250(1 + 50\%)^n$ $\frac{100\,000}{250} = (1,5)^n$ $n = \frac{\log\left(\frac{100\,000}{250}\right)}{\log(1,5)}$ OR/OR $n = \log_{1,5} \frac{100\,000}{250}$ $\therefore n \approx 15$ months/maande	✓ F ✓ SF ✓ log form/-vorm ✓ value of/waarde van n ADDENDUM	A CA CA CA (4)
5.2.1 #	Value of investment end of 3 years/ Waarde van belegging einde van 3 jaar: $A = P(1 + i)^n$ $= R15\,000 \left(1 + \frac{8,5\%}{4}\right)^{3 \times 4}$ $\approx R19\,305,28$ Value of investment end of 5 years/ Waarde van belegging einde van 5 jaar: $A = P(1 + i)^n$ $= R19\,305,28 \left(1 + \frac{6\%}{2}\right)^{2 \times 2}$ $\approx R21\,728,26$ $\therefore R21\,728,26 < R23\,000$ He will NOT have enough money/Hy sal NIE genoeg geld hê NIE.	✓ values of i and n/ waarde van i en n ✓ S ✓ values of i and n/ waarde van i en n ✓ R 21 728,26 ✓ conclusion/gevolgtrekking	A CA A CA CA

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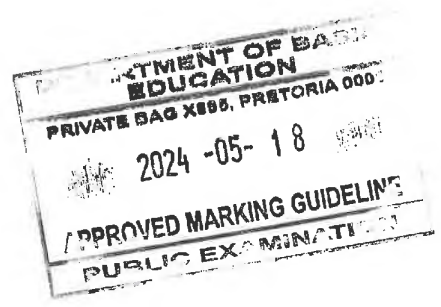


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	OR/OF	OR/OF	
	$A = P(1+i)^n$ $= R15000 \left(1 + \frac{8,5\%}{4}\right)^{3 \times 4} \times \left(1 + \frac{6\%}{2}\right)^{2 \times 2}$ $\approx R 21\,728,26$ $\therefore R 21\,728,26 < R 23\,000$ <p>He will NOT have enough money/<i>Hy sal NIE</i> <i>genoeg geld hê NIE</i></p>	✓ M ✓ values of <i>i</i> and <i>n</i> / <i>waarde van i en n</i> ✓ values of <i>i</i> and <i>n</i> / <i>waarde van i en n</i> ✓ R 21 728,26 ✓ conclusion/ <i>gevolgtrekking</i>	A A A CA CA (5)
5.2.2	$R 21\,728,26 - R 15\,000$ $= R 6\,728,26$	✓ M subtracting / <i>af trek</i> ✓ interest earned / <i>rente verdien</i>	A CA (2)
		ADDENDUM	
			[15]



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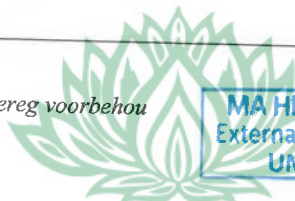
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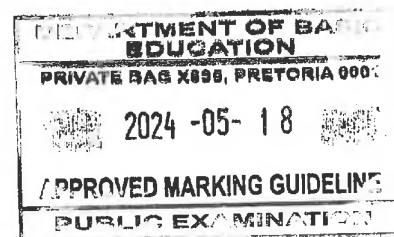
QUESTION/VRAAG 6

<p>6.1 #</p>	$f(x) = 11 + 7x$ $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{11 + 7(x+h) - (11 + 7x)}{h}$ $= \lim_{h \rightarrow 0} \frac{11 + 7x + 7h - 11 - 7x}{h}$ $= \lim_{h \rightarrow 0} \frac{7h}{h}$ $= \lim_{h \rightarrow 0} (7)$ $\therefore f'(x) = 7$	<p>✓ definition/definisie</p> <p>✓ SF</p> <p>✓ S (only if the given expression is used)/ (slegs as die gegewe uitdrukking gebruik is.)</p> <p>✓ S</p> <p>✓ 7</p> <p>Penalty: 1 mark for incorrect notation/ Penaliseer : 1 punt vir foutive notasie</p> <p>AO : 1 mark/ punt</p> <p>ADDENDUM</p>	<p>A</p> <p>A</p> <p>CA</p> <p>CA</p> <p>CA</p> <p>(5)</p>
<p>6.2.1</p>	$y = x^8$ $\therefore \frac{dy}{dx} = 8x^7$	<p>✓ $8x^7$</p>	<p>A</p> <p>(1)</p>
<p>6.2.2</p>	$f(x) = \sqrt[3]{x^4}$ $= x^{\frac{4}{3}}$ $\therefore f'(x) = \frac{4}{3}x^{\frac{1}{3}} \text{ OR / OF } f'(x) = \frac{4}{3}\sqrt[3]{x}$	<p>✓ $x^{\frac{4}{3}}$</p> <p>✓ $\frac{4}{3}x^{\frac{1}{3}}$ OR / OF</p> <p>$\frac{4}{3}\sqrt[3]{x}$</p>	<p>A</p> <p>CA</p> <p>(2)</p>
<p>6.2.3</p>	$D_x \left[\frac{x^2 - 16}{4 - x} \right]$ $= D_x \left[\frac{(x+4)(x-4)}{-(x-4)} \right] \text{ OR / OF } = D_x \left[\frac{-(x+4)(4-x)}{(4-x)} \right]$ $= D_x [-x - 4]$ $= -1$	<p>✓✓ factors /faktore</p> <p>✓ S</p> <p>✓ -1</p>	<p>A</p> <p>A</p> <p>CA</p> <p>CA</p> <p>(4)</p>

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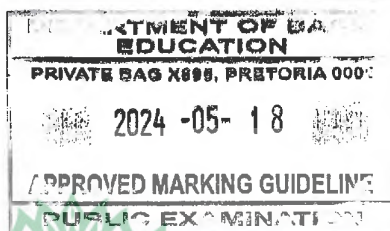


6.3	$g(x) = -\frac{9}{x}$ $g(-3) = -\frac{9}{(-3)} = 3$ $g(-1) = -\frac{9}{(-1)} = 9$ $\text{Av./Gemid. Gradient} = \frac{g(x_2) - g(x_1)}{x_2 - x_1}$ $= \frac{3 - 9}{-3 - (-1)} \quad \text{OR/OF} \quad = \frac{9 - 3}{-1 - (-3)}$ $= 3$	<p>✓ both $g(x)$-values beide $g(x)$-waardes</p> <p>✓ F</p> <p>✓ 3</p>	<p>A</p> <p>A</p> <p>CA (3)</p>
6.4.1	$f(x) = mx^3 + mx - 4$ $\therefore f'(x) = 3mx^2 + m + 0$	<p>✓ $3mx^2$</p> <p>✓ $m + 0$ OR/OF $m - 0$</p>	<p>A</p> <p>A (2)</p>
6.4.2	$f'(2) = 3m(2)^2 + m = 13m$	<p>✓ $13m$</p>	<p>CA (1)</p>
6.4.3	$f'(2) = 39$ $13m = 39$ $m = 3$	<p>✓ Equating derivative to 39/ Stel afgeleide gelyk aan 39</p> <p>✓ Value of / waarde van m</p>	<p>CA</p> <p>CA (2)</p>
			[20]

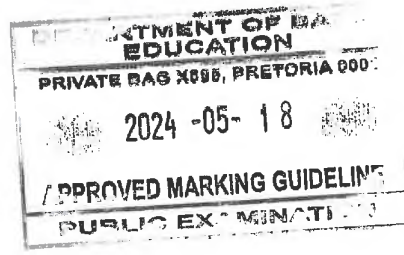


QUESTION/VRAAG 7

7.1	$F(0; -2)$	<ul style="list-style-type: none"> ✓ 0 ✓ -2 	<ul style="list-style-type: none"> A A <p>(2)</p>
7.2	$2^3 + p(2)^2 + 9(2) - 2 = 0$ $8 + 4p + 18 - 2 = 0$ OR/OF $4p = -24$ $p = -6$	<ul style="list-style-type: none"> ✓ Subst./verv. (2; 0) ✓ S 	<ul style="list-style-type: none"> A A <p>(2)</p>
7.3	<p><i>x</i> - intercepts/<i>afsnitte</i>, $y = 0$</p> $(x - 2)(x^2 - 4x + 1) = 0$ $\therefore x = 2$ or/of $x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(1)}}{2(1)}$ $\therefore x_B = 2$ and / en $x_A = 2 - \sqrt{3}$ and / en $x_C = 2 + \sqrt{3}$ $\therefore BC = \sqrt{3}$	<ul style="list-style-type: none"> ✓ = 0 ✓ quadratic factor <i>kwadratiese faktor</i> ✓ SF ✓ values of/waardes van <i>x</i> ✓ length of / lengte van BC <p>AO: Full Marks/Volpunte</p> <p>ADDENDUM</p>	<ul style="list-style-type: none"> A A <p>CA</p> <p>CA</p> <p>CA</p> <p>(5)</p>
7.4	$h'(x) = 3x^2 - 12x + 9 = 0$ $3(x - 1)(x - 3) = 0$ OR/OF $x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(3)(9)}}{2(3)}$ $\therefore x = 1$ or/of $x = 3$ $h(1) = (1)^3 - 6(1)^2 + 9(1) - 2 = 2$ $h(3) = (3)^3 - 6(3)^2 + 9(3) - 2 = -2$ $\therefore D(1; 2)$ and / en $E(3; -2)$	<ul style="list-style-type: none"> ✓ derivative/<i>afgeleide</i> ✓ derivative = 0 <i>afgeleide = 0</i> ✓ factors/formula <i>faktore/formule</i> ✓ both <i>x</i>-values <i>beide x-waardes</i> ✓ both <i>y</i>-values <i>beide y-waardes</i> <p>AO: Full Marks/Volpunte</p> <p>ADDENDUM</p>	<ul style="list-style-type: none"> A A <p>CA</p> <p>CA</p> <p>CA</p> <p>(5)</p>



7.5	$2 < x < 3$ or / of $x > 2 + \sqrt{3}$	<ul style="list-style-type: none"> ✓ critical values <i>kritiese waardes</i> ✓ correct notation <i>korrekte notasie</i> ✓ $x > 2 + \sqrt{3}$ 	CA
	OR/OF	OR/OF	
	$x \in (2; 3)$ or / of $x \in (2 + \sqrt{3}; \infty)$	<ul style="list-style-type: none"> ✓ critical values <i>kritiese waardes</i> ✓ correct notation <i>korrekte notasie</i> ✓ $x \in (2 + \sqrt{3}; \infty)$ 	CA
	OR/OF	OR/OF	
	$x > 2$ and /en $x < 3$ or / of $x > 2 + \sqrt{3}$	<ul style="list-style-type: none"> ✓ critical values <i>kritiese waardes</i> ✓ correct notation <i>korrekte notasie</i> ✓ $x > 2 + \sqrt{3}$ 	CA
			(3)
			[17]



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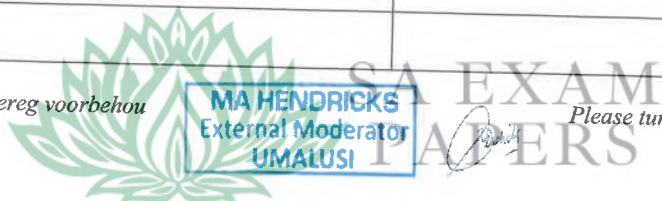
01

QUESTION/VRAAG 8

8.1	$h(0) = -(0)^2 + 6(0) + 1,62$ $= 1,62 \text{ m}$	$\checkmark 1,62 \text{ m}$	<p>A NPU (1)</p>
8.2	$h'(t) = -2t + 6$	$\checkmark -2t + 6$	<p>A (1)</p>
8.3	$h'(t) = 0 \quad \text{OR/OF} \quad t = -\frac{b}{2a}$ $\therefore -2t + 6 = 0 \quad t = -\frac{(6)}{2(-1)}$ $t = 3 \text{ s}$ $h(3) = -(3)^2 + 6(3) + 1,62$ $= 10,62 \text{ m}$ <p style="text-align: center;">OR/OF</p> $h = \frac{4ac - b^2}{4a}$ $h = \frac{4(-1)(1,62) - (6)^2}{4(-1)}$ $= 10,62 \text{ m}$	\checkmark derivative/ afgeleide = 0 OR/OF using/ gebruik $-\frac{b}{2a}$ \checkmark t-value / waarde \checkmark Subst. t-value/waarde \checkmark Maximum height/ maks hoogte <p style="text-align: center;">OR/OF</p> \checkmark F $\checkmark\checkmark$ subst/verv. a,b and/en c value/ waarde \checkmark Maximum height/ maks hoogte	<p>A CA CA CA NPU</p> <p style="text-align: center;">OR/OF</p> <p>A A A CA NPU (4)</p> <p>CA CA CA NPU (3)</p> <p>[9]</p>
8.4	$-2t + 6 = 3$ $t = 1,5 \text{ s}$ $\therefore h(1,5) = -(1,5)^2 + 6(1,5) + 1,62$ $\approx 8,37 \text{ m}$ <p style="text-align: center;">OR/OF</p> $-2t + 6 = -3$ $t = 4,5 \text{ s}$ $\therefore h(4,5) = -(4,5)^2 + 6(4,5) + 1,62$ $\approx 8,37 \text{ m}$	\checkmark derivative / afgeleide = 3 \checkmark t-value / waarde \checkmark height / hoogte <p style="text-align: center;">OR/OF</p> \checkmark derivative / afgeleide = -3 \checkmark t-value / waarde \checkmark height / hoogte	<p>CA CA CA NPU</p> <p>CA CA CA NPU (3)</p>

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101

QUESTION/VRAAG 9

9.1.1	$\int x^4 dx$ $= \frac{x^5}{5} + C$	$\checkmark \frac{x^5}{5}$ $\checkmark C$	<p>A</p> <p>A</p> <p>(2)</p>
9.1.2	$\int \left(2\pi + \frac{4}{x} \right) dx$ $= 2\pi x + 4 \ln x + C$	$\checkmark 2\pi x$ $\checkmark 4 \ln x + C$ <p>No Penalty if C omitted/ Geen penalisering indien C weggelaat</p>	<p>A</p> <p>A</p> <p>(2)</p>
9.1.3	$\int (2x^{-3})^3 dx$ $\int 8x^{-9} dx$ $= -x^{-8} + C \quad \text{OR/OF} \quad = -\frac{1}{x^8} + C$	$\checkmark 8x^{-9}$ $\checkmark -x^{-8} + C$ <p>No Penalty if C omitted/ Geen penalisering indien C weggelaat</p>	<p>A</p> <p>CA</p> <p>(2)</p>
9.2 #	$A = \int_{-1}^3 g(x) dx$ $= \int_{-1}^3 (2^x + 2) dx$ $= \left[\frac{2^x}{\ln 2} + 2x \right]_{-1}^3$ $= \left[\frac{(2)^3}{\ln 2} + 2(3) \right] - \left[\frac{(2)^{-1}}{\ln 2} + 2(-1) \right]$ $\approx 18,82 \text{ units}^2 / \text{eenhede}^2$ <p>OR/OF</p> $= 8 + \frac{15}{2 \ln 2} \text{ units}^2 / \text{eenhede}^2$ <div data-bbox="375 1602 760 1833" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">DEPARTMENT OF BASIC EDUCATION PRIVATE BAG X895, PRETORIA 0001</p> <p style="text-align: center;">2024 -05- 18</p> <p style="text-align: center;">APPROVED MARKING GUIDELINES PUBLIC EXAMINATION</p> </div>	\checkmark Area notation using integrals/ Oppervlak-notasie met gebruik van integrale $\checkmark \frac{2^x}{\ln 2}$ $\checkmark + 2x$ $\checkmark \checkmark \text{ SF}$ $\checkmark \text{ area /oppervl}$ <p>AO: 1 mark/ 1 punt NPU</p> <p>No substitution or simplification marks to be allocated if there is no integration/ Geen vervangings- of vereenvoudigingspunte moet toegeken word as daar geen integrasie is nie.</p> <p>ADDENDUM</p>	<p>M</p> <p>A</p> <p>A</p> <p>CA</p> <p>CA</p> <p>(6)</p>
			[12]

TOTAL/TOTAAL: 150

Wkwi

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