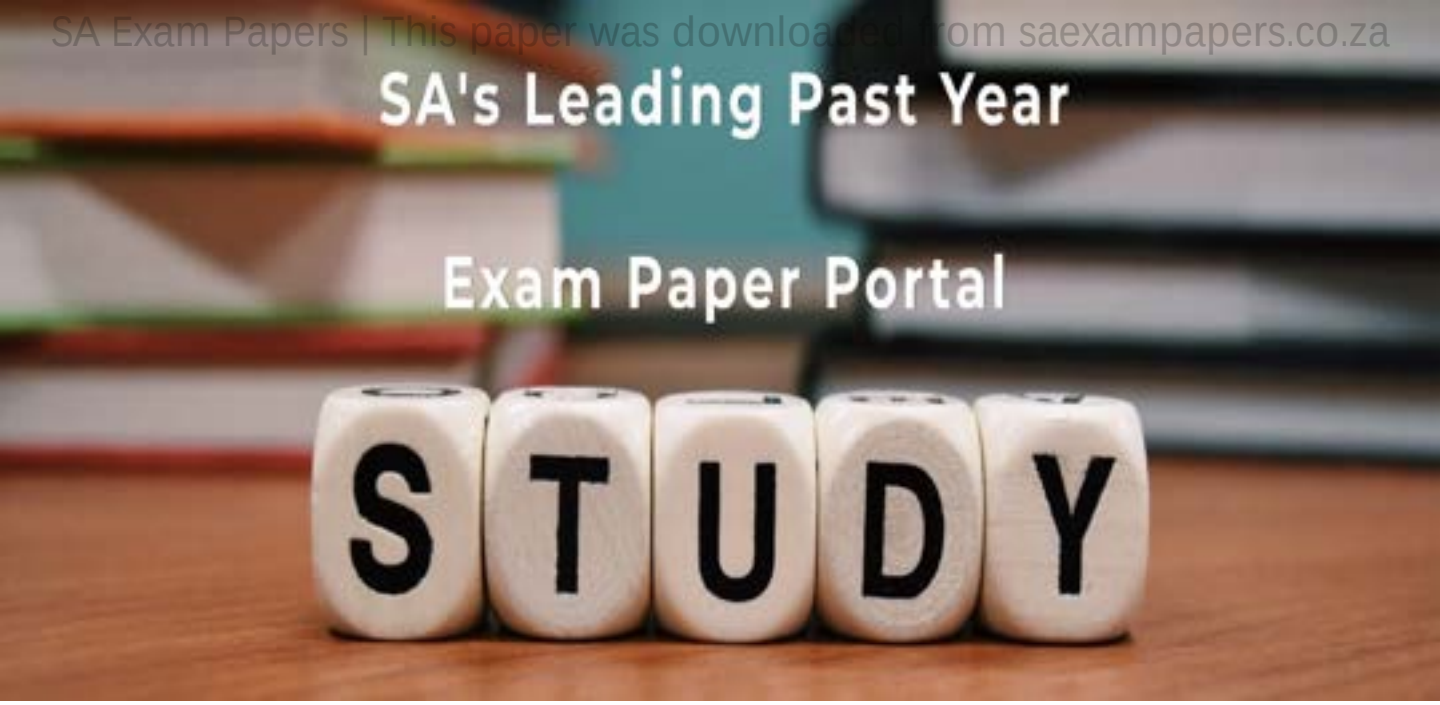


GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATIONS
VOORBEREIDENDE EKSAMEN
2023

MARKING GUIDELINES/
NASIENRIGLYNE

TECHNICAL MATHEMATICS P1/*TEGNIESE WISKUNDE V1*
(11091)

18 pages/*bladsye*

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*
F	Formula/F*ormule*
SF	Substitution in correct formula/*Vervanging in korrekte formule*
AO	Answer only/*Slegs antwoord*

NOTES:
- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out an attempt to answer a question and did not redo it, mark the crossed-out version.
- Consistent accuracy applies in all aspects of the marking guidelines where indicated.

NOTAS:
- *Indien 'n kandidaat 'n vraag TWEE keer beantwoord, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n poging om 'n vraag te beantwoord deurgehaal het en dit nie oorgedoen het nie, merk die deurgehaalde weergawe.*
- *Volgehoue akkuraatheid is deurgaans op alle aspekte van die nasienriglyne van toepassing, waar aangedui.*

QUESTION/*VRAAG* 1

				CL/KV
1.1	1.1.1	$x+3=2$ $x=-1$	✓$x+3=2$ A ✓ $x=-1$ A (2)	1E
	1.1.2	$x^3-16x=0$ $x(x^2-16)=0$ $x=0$ or/*of* $x^2-16=0$ $(x-4)(x+4)=0$ $x=4$ or/*of* $x=-4$	✓ $x(x^2-16)$ A ✓ $x=0$ A ✓ $x=4$ CA ✓ $x=-4$ CA (4)	2M
	1.1.3	$x^2=x+3$ $x^2-x-3=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $x=\frac{-(-1)\pm\sqrt{(-1)^2-4(1)(-3)}}{2(1)}$ $x=2,3$ or/*of* $x=-1,3$	✓ $x^2-x-3=0$ A ✓ SF CA ✓ $x=2,3$ CA ✓ $x=-1,3$ CA (4) AO:$\frac{2}{4}$ NPR	1D

	1.1.4	$-x-3 \geq x^2-5$ $0 \geq x^2+x-2$ $(x-1)(x+2) \leq 0$ $-2 \leq x \leq 1$ or/*of* $x\epsilon[-2;1]$ **OR/*OF*** $x+3 \leq -x^2+5$ $x^2+x-2 \leq 0$ $(x-1)(x+2) \leq 0$ $-2 \leq x \leq 1$ or/*of* $x\epsilon[-2;1]$	✓ $0 \geq x^2+x-2$ A ✓ $(x-1)(x+2)$ A ✓ End points/*Eindpunte* CA ✓ Notation/*Notasie* CA (4) **OR/*OF*** ✓ $0 \geq x^2+x-2$ A ✓ $(x-1)(x+2)$ A ✓ End points/*Eindpunte* CA ✓ Notation/*Notasie* CA (4) AO: $\frac{2}{4}$	3E
1.2	$2^y - 16^x = 0$ ..... 1 $y = x^2+4x-4$ ..... 2 $2^y = 16^x$ $2^y = 2^{4x}$ $y = 4x$ ..... 3 Eq. 3=Eq. 2 or/*of Verg. 3=Verg. 2* $x^2+4x-4 = 4x$ $x^2-4 = 0$ $(x-2)(x+2) = 0$ $x = 2$ or/*of* $x = -2$ If/*As x* = 2 then/*dan* $y = 4(2) = 8$ If/*As x* = - 2 then/*dan* $y = 4(-2) = -8$ **OR/*OF***	✓ $2^y = 2^{4x}$ A ✓ $y = 4x$ A ✓$x^2+2x+4 = 4x$ A ✓ $(x-2)(x+2)$ CA ✓ $x = 2$ and/*en* $x = -2$ CA ✓ $y = 8$ and/*en* $y = -8$ CA (6) **OR/*OF***	3M

	$2^y - 16^x = 0$ ..... 1 $y = x^2 + 4x - 4$ ..... 2 $2^y = 16^x$ $2^y = 2^{4x}$ $y = 4x$ $x = \frac{y}{4}$ ..... 3 Eq. 3 into Eq. 2 or/*of Verg. 3 in Verg. 2* $y = \left(\frac{y}{4}\right)^2 + 4\left(\frac{y}{4}\right) - 4$ $\frac{y^2}{16} = 6$ $y^2 = 64$ $y = \pm 8$ $x = \frac{8}{4} = 2$ $x = -\frac{8}{4} = -2$	✓ $2^y = 2^{4x}$ A ✓ $x = \frac{y}{4}$ A ✓ $y = \left(\frac{y}{4}\right)^2 + 4\left(\frac{y}{4}\right) - 4$ A ✓ $y^2 = 64$ CA ✓ $y = 8$ and/*en* $y = -8$ CA ✓ $x = 2$ and/*en* $x = -2$ CA (6)	
1.3	$x = 2_{10} = 10_2$ $y = 8_{10} = 1000_2$	✓10_2 CA ✓1000_2 CA (2) **P: 1 if one or more of the base numbers 2 is omitted.** ***P: 1 indien een of meer van die basis 2 uitgelaat word.***	1E
1.4	1.4.1 $KE = \frac{1}{2}mv^2$ $2KE = mv^2$ $\frac{2KE}{m} = v^2$ $\sqrt{\frac{2KE}{m}} = v$ **OR/*OF***	✓ $2KE = mv^2$ M ✓ $\frac{2KE}{m} = v^2$ M ✓ $\sqrt{\frac{2KE}{m}} = v$ A **OR/*OF***	2M

		$\text{KE} = \frac{1}{2}mv^2$ $\frac{\text{KE}}{\frac{1}{2}} = mv^2$ $\frac{\text{KE}}{\frac{1}{2}m} = v^2$ $v = \sqrt{\frac{\text{KE}}{\frac{1}{2}m}}$	✓ $\frac{\text{KE}}{\frac{1}{2}} = mv^2$ M ✓ $\frac{\text{KE}}{\frac{1}{2}m} = v^2$ M ✓ $v = \sqrt{\frac{\text{KE}}{\frac{1}{2}m}}$ A (3)	
	1.4.2	$\sqrt{\frac{2\text{KE}}{m}} = v$ $\sqrt{\frac{2(411{,}675)}{55}} = v$ $v = 3{,}869108424$ $v = 3{,}9\ m/s$ **OR/*OF*** $v = \sqrt{\frac{\text{KE}}{\frac{1}{2}m}}$ $v = \sqrt{\frac{411{,}675}{\frac{1}{2}(55)}}$ $v = 3{,}869108424$ $v = 3{,}9\ m/s$ **OR/*OF***	✓ SF CA ✓ $v = 3{,}9\ m/s$ CA **OR/*OF*** ✓ SF CA ✓ $v = 3{,}9\ m/s$ CA **OR/*OF***	1M

		$\text{KE} = \frac{1}{2}mv^2$ $411{,}675 = \frac{1}{2}(55)v^2$ $411{,}675 = 27{,}5v^2$ $v^2 = 14{,}97$ $v = \sqrt{14{,}97}$ $v = 3{,}9\ m/s$	✓ SF CA ✓ $v = 3{,}9\ m/s$ CA (2) PR	
			[27]	

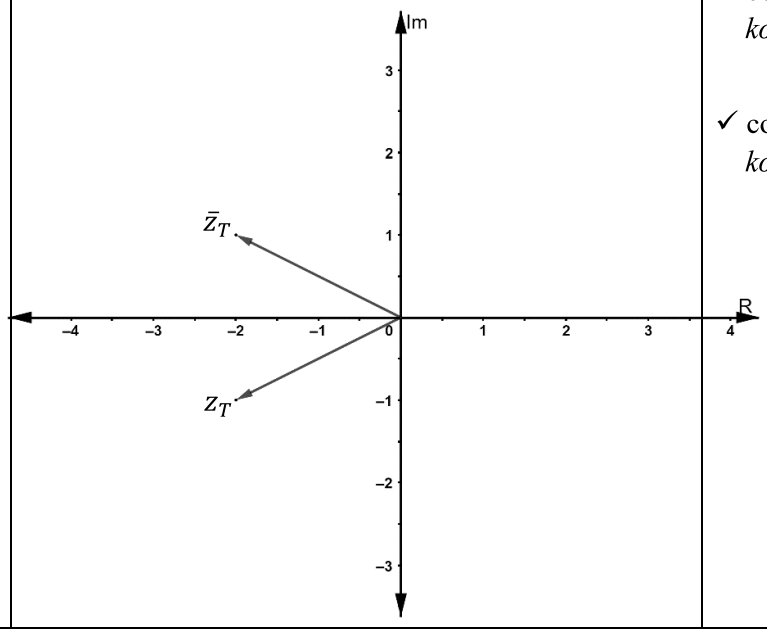
QUESTION/*VRAAG* 2

			CL/ *KV*
2.1	$3x^2 - 5x + 1 = 0$ $\Delta = b^2 - 4ac$ $\Delta = (-5)^2 - 4(3)(1)$ $\Delta = 13$ Roots are real, unequal, and irrational. *Wortels is reël, ongelyk en irrasionaal.*	✓ $\Delta = 13$ A ✓ Conclusion/*Gevolgtrekking* CA (2)	3E
2.2	$x^2 + (k+2)x + 3k = 2$ $x^2 + (k+2)x + 3k - 2 = 0$ $\Delta = b^2 - 4ac$ $= (k+2)^2 - 4(1)(3k-2)$ $= k^2 + 4k + 4 - 12k + 8$ $\therefore \Delta = k^2 - 8k + 12$ **For real roots/*Vir reële wortels*: $\Delta > 0$** $(k-6)(k-2) > 0$ $k < 2$ OR/*OF* $k > 6$	✓ Equation in standard form/ *Vergelyking in standaard vorm* $x^2 + (k+2)x + 3k - 2 = 0$ A ✓ $\Delta = k^2 - 8k + 12$ A ✓ $(k-6)(k-2) > 0$ CA ✓ $k < 2$ OR/*OF* CA ✓ $k > 6$ CA (5)	4M
		[7]	

QUESTION/*VRAAG* 3

					CL/ *KV*
3.1	3.1.1	$3\log 20 - \log 4 - \log 2$ $= 3\,[\log(2 \times 10)] - 2\log 2 - \log 2$ $= 3(\log 2 + \log 10) - 3\log 2$ $= 3(\log 2 + 1) - 3\log 2$ $= 3\log 2 + 3 - 3\log 2$ $= 3$ **OR / OF** $3\log 20 - \log 4 - \log 2$ $= \log 8000 - \log 4 - \log 2$ $= \log\left(\frac{8000}{4 \times 2}\right)$ $= \log 1000$ $= 3$	✓ $2\log 2$ ✓ $3\,(\log 2 + \log 10)$ ✓ $\log 10 = 1$ ✓ 3 (4) **OR / OF** ✓ $\log 8000$ ✓$\log\left(\frac{8000}{4\times 2}\right)$ ✓ $\log 1000$ ✓ 3 (4) AO: $\frac{1}{4}$	A A A CA A A A CA	2M
	3.1.2	$\frac{2i^8 - 3i^7 + 4i^6}{5i^9}$ $= \frac{2i^8}{5i^9} - \frac{3i^7}{5i^9} + \frac{4i^6}{5i^9}$ $= \frac{2}{5i} - \frac{3}{5i^2} + \frac{4}{5i^3}$ $= \frac{2}{5i} \times \frac{i}{i} - \frac{3}{5(-1)} + \frac{4}{5i(-1)}$ $= \frac{2i}{-5} + \frac{3}{5} - \frac{4}{5i} \times \frac{i}{i}$ $= -\frac{2}{5}i + \frac{3}{5} - \frac{4i}{5(-1)}$ $= -\frac{2}{5}i + \frac{3}{5} + \frac{4}{5}i$ $= \frac{3}{5} + \frac{2}{5}i$ **OR / OF**	✓ $\frac{2}{5i} - \frac{3}{5i^2} + \frac{4}{5i^3}$ ✓ $\frac{2}{5i} \times \frac{i}{i} - \frac{3}{5(-1)} + \frac{4}{5i(-1)}$ ✓ $\times \frac{i}{i}$ ✓ $i^2 = -1$ ✓ $\frac{3}{5} + \frac{2}{5}i$ (5) **OR / OF**	M S CA A CA	2D

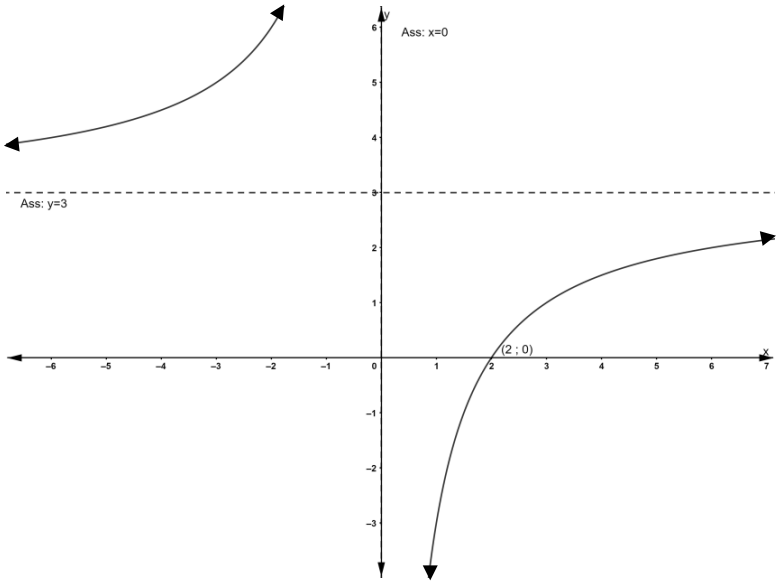
		$\frac{2i^8-3i^7+4i^6}{5i^9}$ $= \frac{i^6(2i^2-3i+4)}{5\,i^6.i^3}$ $= \frac{2i^2-3i+4}{5i^2.i}$ $= \frac{2(-1)-3i+4}{5(-1).i}$ $= \frac{-2-3i+4}{-5\,i}$ $= \frac{2-3i}{-5i}$ $= \frac{2-3i}{-5i} \times \frac{i}{i}$ $= \frac{2i-3i^2}{-5i^2}$ $= \frac{2i+3}{5}$ $= \frac{3}{5}+\frac{2}{5}i$	✓ $\frac{2(-1)-3i+4}{5(-1).i}$ M ✓ $\frac{-2-3i+4}{-5i}$ S ✓ $\times \frac{i}{i}$ CA ✓ $i^2 = -1$ A ✓ $\frac{3}{5}+\frac{2}{5}i$ CA (5)	
		OR/*OF* $= \frac{2(i^2)^4-3\,(i^2)^3 i+4(i^2)^3}{5(i^2)^4 i}$ $= \frac{2(-1)^4-3\,(-1)^3 i+4(-1)^3}{5(-1)^4 i}$ $= \frac{2+3i-4}{5i}$ $= \frac{-2+3i}{5i}$ $= \frac{-2+3i}{5i} \times \frac{i}{i}$ $= \frac{-2i+3i^2}{5i^2}$ $= \frac{-2i+3(-1)}{5(-1)}$ $= \frac{-2i}{-5}+\left(\frac{-3}{-5}\right)$ $= \frac{3}{5}+\frac{2}{5}i$	**OR/*OF*** ✓ $\frac{2(i^2)^4-3\,(i^2)^3 i+4(i^2)^3}{5(i^2)^4 i}$ M ✓$i^2 = -1$ A ✓$\times \frac{i}{i}$ CA ✓ $\frac{-2i+3(-1)}{5(-1)}$ CA ✓ $\frac{3}{5}+\frac{2}{5}i$ CA (5)	

	3.1.3	$\frac{\sqrt{75}-\sqrt{27}}{\sqrt{48}}$ $= \frac{\sqrt{3\times25}-\sqrt{3\times9}}{\sqrt{3\times16}}$ $= \frac{5\sqrt{3}-3\sqrt{3}}{4\sqrt{3}}$ $= \frac{2\sqrt{3}}{4\sqrt{3}}$ $= \frac{1}{2}$	✓ $\frac{5\sqrt{3}-3\sqrt{3}}{4\sqrt{3}}$ A ✓ $\frac{2\sqrt{3}}{4\sqrt{3}}$ A ✓ $\frac{1}{2}$ CA (3) AO: 1 mark/*punt*	2E
3.2	3.2.1	$z_T = -2 - i$	✓ -2 A ✓ $-i$ A (2) AO	2E
	3.2.2	$\bar{z}_T = -2 + i$	✓ $\bar{z}_T = -2 + i$ CA (1)	1E
	3.2.3		✓ correct quadrant of $\bar{z}_t$ *korrekte kwadrant van* $\bar{z}_t$ CA ✓ correct quadrant of z_t *korrekte kwadrant van* z_t CA (2)	1D
			[17]	

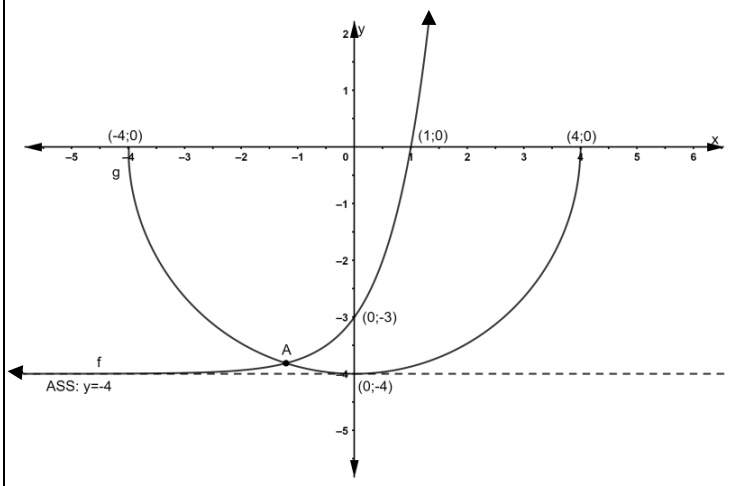
QUESTION/*VRAAG* 4

					CL/*KV*
4.1	4.1.1	$EF = 5 - (-7) = 5 + 7 = 12$	✓M ✓ $EF = 12$	A A (2) **AO: $\frac{2}{2}$**	1E
	4.1.2	For coordinate of/*Vir koördinaat van* D: D $(2\,;\,-3)$ For coordinate of/*Vir koördinaat van* C: $f(x) = -x^2 + 7x - 7$ $f'(x) = -2x + 7$ $0 = -2x + 7$ $2x = 7$ $x = \frac{7}{2}$ $f\left(\frac{7}{2}\right) = \frac{21}{4}$ $\therefore C\left(\frac{7}{2}\,;\,\frac{21}{4}\right)$	✓ 2 ✓ -3 ✓ M ✓ $x = \frac{7}{2}$ ✓ $y = \frac{21}{4}$	A A A A CA (5)	2D

		OR/*OF*	**OR/*OF***	
		For coordinate of/*Vir koördinaat van* D: D $(2\ ;\ -3)$ For coordinate of/*Vir koördinaat van* C: $x = -\frac{b}{2a} = -\frac{7}{2(-1)} = \frac{7}{2}$ MAX./$MAKS. = -\frac{\Delta}{4a} = \frac{-[49-4(-1)(-7)]}{4(-1)} = \frac{21}{4}$ $\therefore$ C$\left(\frac{7}{2};\frac{21}{4}\right)$ ACCEPT/*AANVAAR*: $\left(3\frac{1}{2};5\frac{1}{4}\right)$ **OR/*OF*** (3,5; 5,25)	✓ 2 A ✓ -3 A ✓ $x = -\frac{b}{2a}$ M ✓ $\frac{7}{2}$ A ✓ $y = \frac{21}{4}$ CA (5)	
	4.1.3	$g(x) = 2x^2 - 8x + 5$ $g\left(\frac{5}{2}\right) = 2\left(\frac{5}{2}\right)^2 - 8\left(\frac{5}{2}\right) + 5$ $g\left(\frac{5}{2}\right) = -\frac{5}{2}$ $Q\left(\frac{5}{2}\ ;\ -\frac{5}{2}\right)$ **ACCEPT/*AANVAAR*:** $x = \frac{5}{2}$ and/*en* $y = -\frac{5}{2}$ $x = 2\frac{1}{2} = 2{,}5$ and/*en* $y = -2\frac{1}{2} = -2{,}5$	✓ $x = \frac{5}{2}$ A ✓ $g\left(\frac{5}{2}\right) = -\frac{5}{2}$ A✓ $Q\left(\frac{5}{2}\ ;\ -\frac{5}{2}\right)$ CA (3) **AO**	4E

4.2		✓Asymptotes/ *Asimptote* A ✓ Correct quadrants/ *korrekte kwadrante* A ✓ Correct x – int *korrekte x – afsn* A (3)	4M
		[13]	

QUESTION/*VRAAG* 5				
5.1	Exponential/*Eksponensieël*		✓ Answer/*Antwoord* A (1)	1E
5.2	5.2.1	$f(x) = 4^x - 4$ $0 = 4^x - 4$ $4 = 4^x$ $x = 1$	✓ $f(x) = 0$ A ✓ $4 = 4^x$ M ✓ $x = 1$ CA (3)	2E
	5.2.2	$f(x) = 4^x - 4$ $f(x) = 4^0 - 4$ $f(x) = -3$	✓ $x = 0$ A ✓ $y = -3$ CA (2)	2E
5.3	$y = -4$		✓ $y = -4$ A (1)	1E

5.4		**For graph of *f*/** ***Vir grafiek van f:*** ✓ *x*-intercepts *x-afsnitte* CA ✓ *y*-intercept *y-afsnit* CA ✓ Asymptote/*Asimptote* A ✓ Shape/*Vorm* A **For graph of *g*/** ***Vir grafiek van g*:** ✓ *x*-int./*afsn*. A ✓ *y*-int./*afsn.* A ✓ Shape/*Vorm* A (7)	2E
5.5	Indicated on the graph/*Aangedui op grafiek*	✓ Indicating A/ *Dui A aan* CA (1)	1E
5.6	$h(x) = 4^x - 4 + 5$ $h(x) = 4^x + 1$	✓$h(x) = 4^x + 1$ A (1)	4E
5.7	$-4 \leq y \leq 0$ **OR/*OF*** $y \in [-4; 0]$	✓ both y values/ *beide y waardes* A ✓ inequalities/ *ongelykhede* A (2)	4E
		[18]	

QUESTION/*VRAAG* 6

				CL/*KV*
6.1	$i_{eff} = \left(1 + \frac{i}{m}\right)^m - 1$ $= \left(1 + \frac{0{,}072}{2}\right)^2 - 1$ $= 0{,}073296$ $i = 7{,}33\%$		✓ F A ✓ $m = 2$ A ✓ 0,0732 ... CA ✓ 7,33 CA (4) NPR	2E
6.2	6.2.1	$A = P(1+i)^n$ $= 3\,400\left(1 + \frac{0{,}092}{365}\right)^{365}$ $= 3\,727{,}597$ $= R3\,728$	✓ F A ✓ SF A ✓ $\frac{0{,}092}{365}$ A ✓ R3 728 CA (4) NPR	2E
	6.2.2	No, it is not a fair interest rate./ *Nee, dit is nie 'n billike rentekoers nie.* **OR/*OF*** Yes, Gomolemo only pays R328 in interest without the need to go to a bank. *Ja, Gomolemo betaal net R328 aan rente sonder dat dit nodig is om na 'n bank toe te gaan.*	✓ ST ✓ RE (Yes/No must correlate to learner's reason). *(Ja/Nee moet ooreenstem met die leerder se rede)* Statement only $\frac{0}{2}$ *Slegs stelling* $\frac{0}{2}$ *(2)*	4E

6.3	$A = P(1+I)^n$ $= 20\,000\left(1+\frac{0,125}{12}\right)^{2\times12}$ $= 25\,647,32204$ $A = P(1+i)^n$ $= 25\,647,32204\left(1+\frac{0,098}{4}\right)^{4\times4}$ $= \text{R}37\,777,52$ **OR/*OF*** $A = 20\,000\left(1+\frac{\frac{12,5}{100}}{12}\right)^{24}.\left(1+\frac{\frac{9,8}{100}}{4}\right)^{16}$ $A = \text{R}37\,777,52$	✓ $\frac{0,125}{12}$ A ✓ 2×12 A ✓ 25 647,32 CA ✓ SF CA ✓ 37 777,52 CA (5) **OR/*OF*** ✓ $\frac{0,125}{12}$ A ✓ 24 A ✓ $\frac{\frac{9,8}{100}}{4}$ A ✓ 16 A ✓ 37 777,52 CA (5) **NPR**	3E
		[15]	

QUESTION/*VRAAG* 7

			CL/*KV*
7.1	$f(x) = 5 - 3x$ $f(x+h) = 5-3(x+h)$ $f(x+h) = 5-3x-3h$ $f'(x) = \lim_{h\to0}\frac{f(x+h)-f(x)}{h}$ $f'(x) = \lim_{h\to0}\frac{5-3x-3h-(5-3x)}{h}$ $f'(x) = \lim_{h\to0}\frac{5-3x-3h-5+3x}{h}$ $f'(x) = \lim_{h\to0}\frac{-3h}{h}$ $f'(x) = -3$	✓ Definition/*Definisie* A ✓ SF CA ✓ S $\frac{-3h}{h}$ CA ✓ -3 CA (4) AO: $\frac{0}{4}$	2M

7.2	7.2.1	$\lim\limits_{x\to -2}\dfrac{x^2+3x+2}{x+2}$ $=\lim\limits_{x\to -2}\dfrac{(x+2)(x+1)}{x+2}$ $=\lim\limits_{x\to -2}(x+1)$ $=-2+1$ $=-1$	✓ $(x+2)(x+1)$ A ✓ $(x+1)$ S A ✓ $-2+1$ CA ✓ -1 CA (4)	2D
	7.2.2	$\dfrac{d}{dx}[(x^2+1)(x^{-2}-1)]$ $=\dfrac{d}{dx}(1-x^2+x^{-2}-1)$ $=\dfrac{d}{dx}(-x^2+x^{-2})$ $=-2x-2x^{-3}$ $=-2x-\frac{2}{x^3}$	✓ 1 or/*of* x^0 A ✓ $-x^2+x^{-2}$ A ✓ $-2x$ CA ✓ $-\frac{2}{x^3}$ CA (4)	3E
7.3	$g(x)=4x-x^2$ $g'(x)=4-2x$ $m=g'(3)=4-2(3)=4-6=-2$ $g(3)=4(3)-(3)^2=12-9=3$ $(3;3)$ $y=mx+c$ $y=-2x+c$ $3=-2(3)+c$ $3=-6+c$ $9=c$ $y=-2x+9$	✓ $4-2x$ A ✓ -2 CA ✓ 3 CA ✓ SF CA ✓ $y=-2x+9$ CA (5)	3E
			[17]	

QUESTION/*VRAAG* 8

			CL/*KV*
8.1	$x-1$	✓ $x-1$ A (1)	1E
8.2	D(0 ; 37) **ACCEPT / AANVAAR: $x=0$ and/en $y=37$**	✓ (0 ; 37) A (1)	1E
8.3	$f(x)=2x^3-3x^2-36x+37$ $f'(x)=6x^2-6x-36$ $6x^2-6x-36=0$ $x^2-x-6=0$ $(x+2)(x-3)=0$ $x=-2$ or/*of* $x=3$ $f(-2)=81$ B(−2 ; 81)	✓$f'(x)$ A ✓ $f'(x)=0$ A ✓ factors/*faktore* CA ✓ both x-values *beide x-waardes* CA ✓ B(−2 ; 81) CA (5)	3E
8.4	$-2<x<3$ **OR/*OF*** $x\in(-2;3)$	✓ Notation/*Notasie* A ✓ Endpoints/*Eindpunte* CA (2)	4E
8.5	$f'(x)=6x^2-6x-36$ $f'(-1)=-24$ C(−1; 68) $y-y_c=m(x-x_c)$ $y-68=-24(x+1)$ Therefor the equation of the tangent is given by:/ *Dus is die vergelyking van die raaklyn:* $y=-24x+44$	✓ $m=-24$ CA (-24 has to be calculated / -24 moet bereken word) ✓ SF $x=-1$ A ✓ SF $y=68$ A (3)	4M
		[12]	

QUESTION/*VRAAG* 9

				CL/*KV*
9.1	$P = 2x + 2y + \frac{2\pi r}{2}$ $6 = 2x + 2y + \pi r$ $2y = 6 - 2x - \pi r$ $y = 3 - x - \frac{\pi r}{2}$	✓ M ✓ S	A A (2)	3E
9.2	$L(x) = \frac{lb}{2} + \frac{\pi r^2}{2}$ $L(x) = \frac{y.2x}{2} + \frac{\pi r^2}{2}$ $L(x) = xy + \frac{\pi r^2}{2}$ $L(x) = x\left(3 - x - \frac{\pi x}{2}\right) + \frac{\pi x^2}{2}$ $L(x) = 3x - x^2 - \frac{\pi x^2}{2} + \frac{\pi x^2}{2}$ $L(x) = 3x - x^2$	✓ M ✓ SF ✓ $r = x$ ✓ S ✓ S	A A A A A (5)	3D
9.3	$L(x) = 3x - x^2$ $L'(x) = 3 - 2x$ $0 = 3 - 2x$ $2x = 3$ $x = \frac{3}{2}$ $y = 3 - \frac{3}{2} - \frac{\pi r}{2}$ $y = \frac{3}{2} - \frac{\pi\left(\frac{3}{2}\right)}{2}$ $y = \frac{3}{2} - \frac{3}{4}\pi$	✓ $0 = 3 - 2x$ ✓ $x = \frac{3}{2}$ ✓ $y = \frac{3}{2} - \frac{3}{4}\pi$	A CA CA (3)	3E

9.4	$L(x) = 3x - x^2$ $L\left(\frac{3}{2}\right) = 3\left(\frac{3}{2}\right) - \left(\frac{3}{2}\right)^2$ $L\left(\frac{3}{2}\right) = \frac{9}{2} - \frac{9}{4}$ $L\left(\frac{3}{2}\right) = \frac{18-9}{4} = \frac{9}{4}$ **ACCEPT/*AANVAAR*:** $2\frac{1}{4}$ or/*of* 2,25	✓ SF CA ✓ $L\left(\frac{3}{2}\right) = \frac{9}{4}$ CA (2)	3M
		[12]	

QUESTION/*VRAAG* 10

					CL/*KV*
10.1	10.1.1	$\int(4 + 2^{3x})\,dx$ $= 4x + \frac{2^{3x}}{3ln2} + C$	✓ $4x$ A ✓ $\frac{2^{3x}}{3ln2}$ A ✓ C A (3)		2M
	10.1.2	$\int\left(\sqrt{x} + 6x^2 - \frac{8}{x}\right)dx$ $\int\left(x^{\frac{1}{2}} + 6x^2 - \frac{8}{x}\right)dx$ $= \frac{2}{3}x^{\frac{3}{2}} + 2x^3 - 8lnx + C$	✓ $x^{\frac{1}{2}}$ A ✓ $\frac{2}{3}x^{\frac{3}{2}}$ A ✓ $2x^3$ CA ✓ $-8lnx + c$ CA (4)		2D
10.2	A/*Opp* $= \int_1^4(-x^3 + 6x^2)dx$ A/*Opp* $= [-\frac{1}{4}x^4 + 2x^3]_1^4$ A/*Opp* $= \left[-\frac{1}{4}(4)^4 + 2(4)^3\right] - \left[-\frac{1}{4}(1)^4 + 2(1)^3\right]$ A/*Opp* $= 64 - \frac{7}{4}$ A/*Opp* $= 62\frac{1}{4}\ unit^2$ **which is less than $62\frac{1}{2}$ sq. units./** $eenheid^2$ ***wat minder as $62\frac{1}{2}$ eenhede is.***	✓ F A ✓ M A ✓ SF CA ✓ S CA ✓ $62\frac{1}{4}$ CA (5)		3M
			[12]		
		TOTAL/*TOTAAL*:	**150**		