basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

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

TECHNICAL MATHEMATICS P1/*TEGNIESE WISKUNDE V1*
MAY/JUNE/*MEI/JUNIE* 2025
FINAL MARKING GUIDELINES/*FINALE 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 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*
F	Use of correct Formula/*Gebruik van korrekte Formule*
AO	Answer Only/*Slegs antwoord*

DATE APPROVED/DATUM GOEDGEKEUR	**23 MAY 2025**
EXTERNAL/*EKSTERNE* MODERATORS	INTERNAL /*INTERNE* MODERATORS
M.A. HENDRICKS	**N. TOM**
MA HENDRICKS External Moderator UMALUSI	
B.J SHABANGU	

These marking guidelines consist of 22 pages.
Hierdie nasienriglyne bestaan uit 22 bladsye.

NOTE:

- If a candidate answers a question **TWICE**, only mark 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 3.1.3 ; Q 5.3 ; Q 6.5.3 & Q 7.4

LET WEL:

- *Indien 'n kandidaat 'n vraag **TWEE KEER** beantwoord, sien slegs die **EERSTE** poging*
- *Volgehoue akkuraatheid is deurgaans op alle aspekte van die nasienriglyne waar aangedui.*
- *# Toon vrae waar Toleransie wydte (Verdraagsaamheids omvang) toegepas word:*

V 3.1.3 ; V 5.3 ; V 6.5.3 & V 7.4

QUESTION/*VRAAG* 1

1.1.1	$(4x+1)(5-x)=0$ $x=5$ or/*of* $x=-\frac{1}{4}$ **OR / *OF*** $-0,25$	✓ $-\frac{1}{4}$ **A** ✓ 5 **A** (2)
1.1.2	$x(7x-9)-8=0$ $7x^2-9x-8=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $=\frac{-(-9)\pm\sqrt{(-9)^2-4(7)(-8)}}{2(7)}$ $=\frac{9\pm\sqrt{305}}{14}$ $\therefore x\approx 1,89$ or/*of* $x\approx -0,60$	✓ std form/*vorm* **A** ✓ **SF** **CA** ✓✓ each x-value/*elke x-waarde* **CA** **AO: Full marks/*Volpunte* NPR** (4)

1.1.3	$-x^2+5x+6>0$ $-(x-6)(x+1)>0$ **OR/*OF*** $x^2-5x-6<0$ $(x-6)(x+1)<0$ **OR/*OF*** $\frac{-(5)\pm\sqrt{(5)^2-4(-1)(6)}}{2(-1)}$ Critical values/*Kritiese waardes*: 6 and/*en* -1 $\therefore\ x\in(-1;6)$	✓ factors/*faktore*/**SF** **A** ✓ critical values/*kritieke waardes* **CA** ✓ correct notation/*korrekte notasie* **A** **AO: Full marks/*Volpunte*** (3)

1.2.1	$y=2x+1$	✓ subject/*onderwerp* **A** (1)
1.2.2	$y=2x+1$ $x^2-xy+y^2=7$ $x^2-x(2x+1)+(2x+1)^2=7$ $x^2-2x^2-x+4x^2+4x+1=7$ $3x^2+3x-6=0$ $x^2+x-2=0$ $(x+2)(x-1)=0$ **OR/*OF*** $x=\frac{-(1)\pm\sqrt{(1)^2-4(1)(-2)}}{2(1)}$ $\therefore\ x=-2$ or/*of* $x=1$ $\therefore\ y=2(-2)+1=-3$ or/*of* $y=2(1)+1=3$ **OR/*OF***	✓subst./*vervang.* **CA** ✓std form/*vorm* **CA** ✓ factors/*faktore*/**SF** **CA** ✓ both x-values/*beide x-wrdes* **CA** ✓both y-values/*beide y-wrdes* **CA** **OR/*OF***

MA HENDRICKS
External Moderator
UMALUSI

B.J Shabe

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025

	$x = \frac{y-1}{2}$ $x^2 - xy + y^2 = 7$ $\left(\frac{y-1}{2}\right)^2 - \left(\frac{y-1}{2}\right)y + y^2 = 7$ $\frac{y^2-2y+1}{4} - \frac{y^2-y}{2} + y^2 = 7$ $3y^2 - 27 = 0$ $y^2 - 9 = 0$ $(y+3)(y-3) = 0$ **OR/*OF*** $y = \pm\sqrt{9}$ $\therefore\ y = -3$ or/*of* $y = 3$ $\therefore\ x = -2$ or/*of* $x = 1$	✓subst./*vervang* **A** ✓std form/*vorm* **CA** ✓ factors/*faktore*/**SF** **CA** ✓ both *y*-values/*beide y-wrdes* **CA** ✓both *x*-values/*beide x-wrdes* **CA** (5)
1.3.1	$N_s = \frac{60 \times f}{P}$ $P = \frac{60 \times f}{N_s}$	✓ P subject/*onderwerp* **A** (1)
1.3.2	$P = \frac{60 \times f}{N_s}$ $= \frac{60 \times 63}{540} \times 60$ $= 7 \times 60 = 420$ poles / *pale* **OR/*OF*** $N_s = \frac{60 \times f}{P}$ $540 = \frac{60 \times 63}{P} \times 60$ $P = 7 \times 60 = 420$ poles / *pale* **Accept / *Aanvaar*** 7 poles / *pale*	✓ **SF** **CA** ✓**S** **CA** **OR/*OF*** ✓ **SF** **A** ✓**S** **CA** (2)

MA HENDRICKS
External Moderator
UMALUSI

1.4	$R = 4\times15 = 60$ $= \frac{60}{110_2}$ $= \frac{111100_2}{110_2}$ $= 1010_2$ **OR/*OF*** $R = 4\times15 = 60$ $\frac{R}{110_2}$ $= \frac{60}{110_2}$ $= \frac{60}{6}$ $=10$ $= 1010_2$	✓$R = 60$ ✓ binary form/*binêre vorm* ✓ 1010_2 **OR/*OF*** ✓$R = 60$ ✓6 ✓ 1010_2 **AO: Full marks/*Volpunte***	**A** **CA** **CA** **A** **A** **CA** (3)
			[21]

QUESTION/*VRAAG* 2

2.1.1	$\Delta = b^2 - 4ac$ $=(0)^2 - 4(1)(-4)$ $=16$	✓**SF** ✓16	**A** **CA** (2)
2.1.2	Rational and unequal *Rasionaal en ongelyk*	✓ rational/*rasionaal* ✓unequal/*ongelyk*	**CA** **CA** (2)
2.2	$px^2 - 6x + 1 = 0$ $\Delta = 0$ $(-6)^2 - 4(p)(1) = 0$ $36 - 4p = 0$ $\therefore\ p = 9$	✓$\Delta = 0$ ✓**SF** ✓**S** ✓ value of/*waarde van* p	**A** **A** **CA** **CA** (4)
			[8]

QUESTION/*VRAAG* 3

3.1.1	$\log_2 2^b$ $= b$	✓ b	**A** (1)
3.1.2	$\frac{5^{3n}-5^{3n-1}}{5^{3n+1}}$ $= \frac{5^{3n}-5^{3n}\times 5^{-1}}{5^{3n}\times 5}$ **OR/*OF*** $\frac{5^{3n}}{5^{3n+1}}-\frac{5^{3n-1}}{5^{3n+1}}$ $= \frac{5^{3n}\left(1-5^{-1}\right)}{5^{3n}\times 5}$ **OR/*OF*** $5^{3n-3n-1}-5^{3n-1-3n-1}$ $= \frac{1-5^{-1}}{5}$ **OR/*OF*** $5^{-1}-5^{-2}$ $= \frac{4}{25}$ **OR/*OF*** $\frac{5^{3n}-5^{3n-1}}{5^{3n+1}}$ $= \frac{125^n-125^n\times\frac{1}{5}}{125^n\times 5}$ $= \frac{\frac{4}{5}\times 125^n}{5\times 125^n}$ $= \frac{4}{25}$	✓exp. property/*eks eienskap* **A** ✓**S** **CA** ✓ S **CA** **OR/*OF*** ✓exp. property/*eks eienskap* **A** ✓**S** **CA** ✓ S **CA** (3)
3.1.3 #	$\frac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{\sqrt[4]{625x^{12}}}\right)}{2x}$ $= \frac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{5x^3}\right)}{2x}$ $= \frac{\sqrt{100x^4}+\sqrt{900x^4}}{2x}$ $= \frac{10x^2+30x^2}{2x}$ **OR/*OF*** $= \frac{40x^2}{2x}$ $= 20x$ **OR/*OF***	✓$3\sqrt{5x^3}$ **A** ✓$\sqrt{100x^4}$ **A** ✓$\sqrt{900x^4}$ **CA** ✓**S** **CA** ✓ **S** **CA** **OR/*OF***

Please turn over/Blaai om asseblief

MA HENDRICKS
External Moderator
UMALUSI

B.J. Shabe

$$\frac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{\sqrt[4]{625x^{12}}}\right)}{2x}$$

$$=\frac{\sqrt{5\times 4x}\left(\sqrt{5x^3}+3\sqrt{5x^3}\right)}{2x}$$ ✓$3\sqrt{5x^3}$ **A**

$$=\frac{2\sqrt{5x}\left(4\sqrt{5x^3}\right)}{2x}$$ ✓ $2\sqrt{5x}$ **A**

✓$4\sqrt{5x^3}$ **CA**

$$=\frac{40x^2}{2x}$$ ✓**S** **CA**

$$=20x$$ ✓ **S** **CA**

OR/*OF*

OR/*OF*

$$\frac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{\sqrt[4]{625x^{12}}}\right)}{2x}$$

$$=\frac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{5x^3}\right)}{2x}$$ ✓$3\sqrt{5x^3}$ **A**

$$=\frac{\sqrt{20}\,x^{\frac{1}{2}}\left(\sqrt{5}\,x^{\frac{3}{2}}+3\times\sqrt{5}\,x^{\frac{3}{2}}\right)}{2x}$$

$$=\frac{2\sqrt{5}\,x^{\frac{1}{2}}\left(4\sqrt{5}\,x^{\frac{3}{2}}\right)}{2x}$$ ✓ $2\sqrt{5}\,x^{\frac{1}{2}}$ **A**

✓$4\sqrt{5}\,x^{\frac{3}{2}}$ **CA**

$$=\frac{40x^2}{2x}$$ ✓**S** **CA**

$$=20x$$ ✓ **S** **CA**

OR/*OF*

OR/*OF*

$$\frac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{\sqrt[4]{625x^{12}}}\right)}{2x}$$

$$=\frac{\sqrt{4\cdot 5x}\left(\sqrt{5x\cdot x^2}+3\sqrt{5x\cdot x^2}\right)}{2x}$$ ✓$3\sqrt{5x\times x^2}$ **A**

$$=\frac{2\sqrt{5x}\left(x\sqrt{5x}+3x\sqrt{5x}\right)}{2x}$$

$$=\frac{2\sqrt{5x}\left(4x\sqrt{5x}\right)}{2x}$$ ✓ $2\sqrt{5x}$ **A**

✓$4x\sqrt{5x}$ **CA**

$$=4\times 5x$$ ✓**S** **CA**

$$=20x$$ ✓ **S** **CA**

OR/*OF*

OR/*OF*

MA HENDRICKS
External Moderator
UMALUSI

B.J Shabe

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025

	$\dfrac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{\sqrt[4]{625x^{12}}}\right)}{2x}$		
	$=\dfrac{\left(5\cdot 2^2 x\right)^{\frac{1}{2}}\left(\left(5x^3\right)^{\frac{1}{2}}+3\left(5^4x^{12}\right)^{\frac{1}{8}}\right)}{2x}$	✓ $3\left(5^4x^{12}\right)^{\frac{1}{8}}$	**A**
	$=\dfrac{5^{\frac{1}{2}}\cdot 2x^{\frac{1}{2}}\left(5^{\frac{1}{2}}x^{\frac{3}{2}}+3\cdot 5^{\frac{1}{2}}x^{\frac{3}{2}}\right)}{2x}$		
	$=\dfrac{2\cdot 5^{\frac{1}{2}}x^{\frac{1}{2}}\left(4\cdot 5^{\frac{1}{2}}x^{\frac{3}{2}}\right)}{2x}$	✓ $2\cdot 5^{\frac{1}{2}}x^{\frac{1}{2}}$ ✓ $4\cdot 5^{\frac{1}{2}}x^{\frac{3}{2}}$	**A** **CA**
	$=\dfrac{8\cdot 5\cdot x^2}{2x}$	✓**S**	**CA**
	$=20x$	✓ **S**	**CA**
	OR/*OF*	**OR/*OF***	
	$\dfrac{\sqrt{20x}\left(\sqrt{5x^3}+3\sqrt{\sqrt[4]{625x^{12}}}\right)}{2x}$		
	$=2\sqrt{5x}\left(\dfrac{\sqrt{5}x^{\frac{3}{2}}}{2x}+\dfrac{3\sqrt{5}x^{\frac{3}{2}}}{2x}\right)$	✓ $3\sqrt{5}x^{\frac{3}{2}}$	**A**
		✓ $2\sqrt{5x}$	**A**
	$=2\sqrt{5x}\left(\dfrac{\sqrt{5}}{2}x^{\frac{1}{2}}+\dfrac{3\sqrt{5}}{2}x^{\frac{1}{2}}\right)$	✓ $\dfrac{\sqrt{5}}{2}x^{\frac{1}{2}}+\dfrac{3\sqrt{5}}{2}x^{\frac{1}{2}}$	**CA**
	$=2\sqrt{5x}\left(2\sqrt{5x}\right)$	✓**S**	**CA**
	$=4\times 5x$		
	$=20x$	✓ **S**	**CA**
			(5)

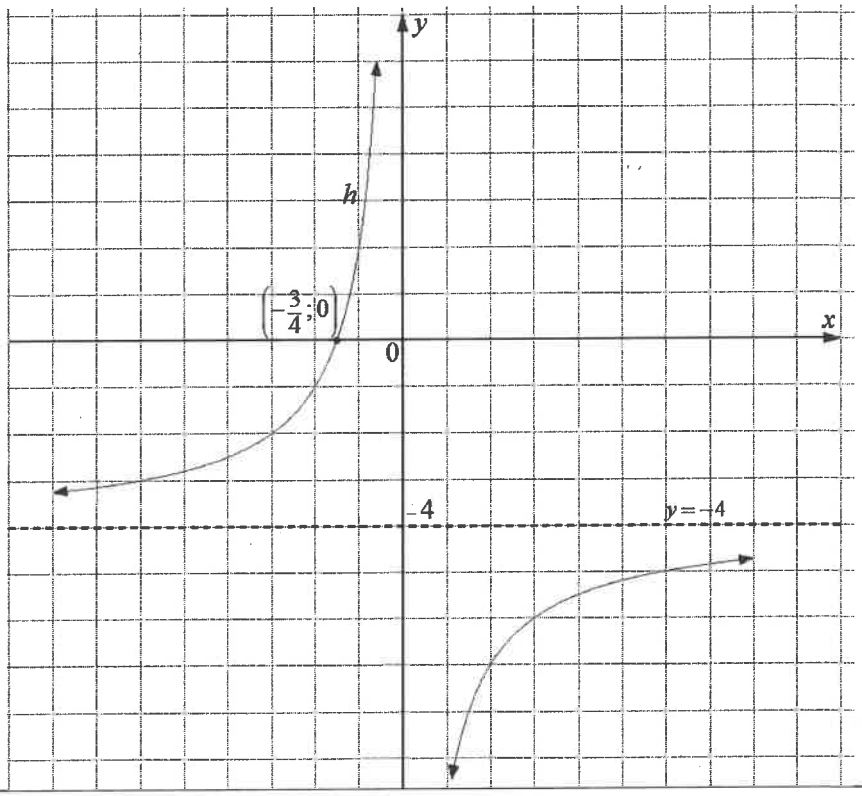
3.2	$\log(x+3) = 1 + \log x$	
	$\log(x+3) - \log x = 1$	
	$\log\frac{(x+3)}{x} = 1$	✓log prop/*eienskap* **A**
	$\log\frac{(x+3)}{x} = \log 10$ **OR/*OF*** $\frac{x+3}{x} = 10^1$	✓ log 10 **OR/*OF*** exponent prop/ *eksponent eienskap* **A**
	$10x = x+3$	✓ **S** **CA**
	$9x = 3$	✓**S** **CA**
	$x = \frac{1}{3}$	✓ **S** **CA**
	OR/*OF*	**OR/*OF***
	$\log(x+3) = 1 + \log x$	
	$\log(x+3) = \log 10 + \log x$	✓ log 10 **A**
	$\log(x+3) = \log 10x$	✓log prop/*eienskap* **CA**
	$x+3 = 10x$	✓ **S** **CA**
	$9x = 3$	✓**S** **CA**
	$x = \frac{1}{3}$	✓ **S** **CA**
	OR/*OF*	**OR/*OF***
	$\log(x+3) = 1 + \log x$	
	$-1 = \log x - \log(x+3)$	
	$-1 = \log\frac{x}{x+3}$	✓log prop/*eienskap* **A**
	$10^{-1} = \frac{x}{x+3}$	✓exponent prop/ *eksponent eienskap* **CA**
	$\frac{1}{10} = \frac{x}{x+3}$	
	$x+3 = 10x$	✓ **S** **CA**
	$9x = 3$	✓**S** **CA**
	$x = \frac{1}{3}$	✓ **S** **CA**
		(5)

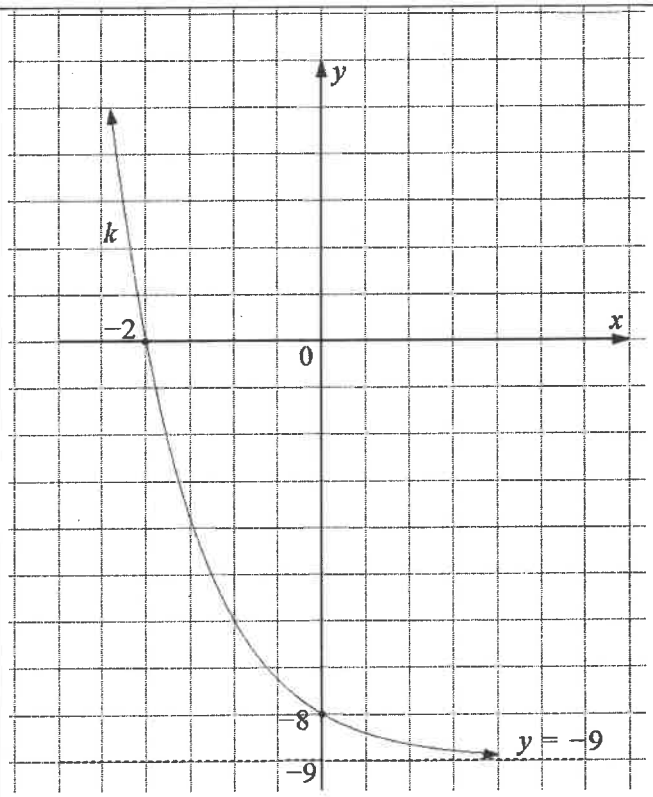
MA HENDRICKS
External Moderator
UMALUSI

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025

3.3	$\sqrt{-16}+3i^2$ $=4i+3(-1)$ $=-3+4i$	✓ -3 ✓ $4i$	**A** **A** (2)
3.4.1	$z=i^7+\sqrt{3}$ $=\sqrt{3}-i$	✓ $z=\sqrt{3}-i$	**A** (1)
3.4.2	$\text{modulus}=\sqrt{(\sqrt{3})^2+(-1)^2}=2$	✓ **SF** ✓ 2 **AO: Full marks/*Volpunte***	**A** **CA** (2)
3.4.3	$\tan\theta=\dfrac{-1}{\sqrt{3}}$ Ref. Angle / *Ver.Hoek* $=30°$ $\therefore\ \theta=360°-30°=330°$ $\therefore z=2cis330°$ **OR/*OF*** $z=2cis\dfrac{11}{6}\pi$ **OR/*OF*** $2\lfloor 330°$ **OR/*OF*** $z=2(\cos330°+i\cdot\sin330°)$ **OR/*OF*** $z=2\left(\cos\dfrac{11}{6}\pi+i\cdot\sin\dfrac{11}{6}\pi\right)$	✓ $\tan\theta=\dfrac{-1}{\sqrt{3}}$ ✓ $\theta=330°$ ✓polar form / *polêre vorm* **AO: Full marks/*Volpunte***	**CA** **CA** **CA** (3)
			[22]

QUESTION/*VRAAG* 4

4.1.1	$x = 0$ $y = -4$	✓ $x = 0$ ✓ $y = -4$	**A** **A** (2)
4.1.2	$-\frac{3}{x} - 4 = 0$ $-\frac{3}{x} = 4$ $4x = -3$ $x = -\frac{3}{4}$ **OR / *OF*** $-0,75$ **Accept/*Aanvaar*:** $\left(-\frac{3}{4}; 0\right)$	✓ $h(x) = 0$ ✓ x-value/*waarde*	**A** **CA** (2)
4.1.3			
		✓ shape/*vorm* ✓ x-intercept/*afsnit* ✓ horizontal asymptote/*horisontale asimptoot*	**A** **CA** **CA** (3)

4.2		✓ shape/*vorm* **A** ✓ *x*-intercept/*afsnit* **A** ✓ *y*-intercept/*afsnit* **A** ✓ asymptote/*asimptoot* **A** (4)
4.3.1	$C(0\,;-5)$	✓ 0 **A** ✓ −5 **A** (2)
4.3.2	$x^2 - 4x - 5 = 0$ $(x-5)(x+1) = 0$ $x = 5$ or/*of* $x = -1$ AB = 6 units / *eenhede*	✓ $f(x) = 0$ **A** ✓ factors/*faktore* **A** ✓ both/*beide x*-values/ *waardes* **CA** ✓ length of/*lengte van* AB **CA** **AO: Full marks/*Volpunte*** (4)
4.3.3	$x = -\frac{b}{2a}$ $x = -\frac{-4}{2(1)}$ **OR/*OF*** $x = \frac{5-1}{2}$ **OR/*OF*** $f'(x) = 2x - 4 = 0$ $\therefore x = 2$ $y = (2)^2 - 4(2) - 5$ **OR/*OF*** $y = \frac{4(1)(-5)-(-4)^2}{4(1)}$ $y = -9$ $\therefore$ D(2;−9)	✓ **SF/M** **A** ✓ *x*-value/*waarde* **CA** ✓ *y*-value/*waarde* **CA** **AO: Full marks/*Volpunte*** (3)

Please turn over/Blaai om asseblief

MA HENDRICKS
External Moderator
UMALUSI

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025

4.3.4	$y \geq -9$ **OR/*OF*** $y \in [-9\,;\infty)$ **OR/*OF*** $-9 \leq y < \infty$	✓range/*waardevers/terrein* **CA** (1)
4.3.5	$m = \dfrac{0+5}{5-0}$ $= 1$ $y = x - 5$	✓ **SF** **CA** ✓ value/*waarde* **CA** ✓ equation/*vergelyking* **CA** **AO: Full marks/*Volpunte*** (3)
4.3.6	$y_E = (2) - 5 = -3$ $\therefore$ ED = 6 units/*eenhede*	✓ *y*-coord. of E/*y-koör v E* **CA** ✓ length/*lengte* ED **CA** **AO: Full marks/*Volpunte*** (2)
		[26]

QUESTION/*VRAAG* 5

5.1.1	$A = R464,48 \times 24 + R1\,000$ $= R12\,147,52$	✓ value / *waarde*	**A** (1)
5.1.2	$A = P(1 + ni)$ $11\,147,52 = 9\,063(1+2i)$ $\therefore 1+2i \approx 1,2300...$ $\therefore 2i \approx 0,23...$ $\therefore i \approx 0,115$ **OR/*OF*** $r \approx 11,50\%$ **OR/*OF*** Simple interest $= Pni$ $2\,084,52 = 9\,063 \times 2 \times i$ $\therefore i \approx 0,115$ **OR/*OF*** $r \approx 11,50\%$ **OR/*OF*** $n \times \text{Interest}\% = \frac{V_{final} - V_{initial}}{V_{initial}} \times 100\%$ $2r = \frac{11\,147,52 - 9\,063}{9\,063} \times 100\%$ $r \approx 11,50\%$	✓**F** ✓11 147,52 ✓9 063 ✓ value of/*waarde van i* **OR/*OF*** ✓**F** ✓2 084,52 ✓9 063 ✓ value of/*waarde van i* **OR/*OF*** ✓**F** ✓11 147,52 ✓9 063 ✓ value of/*waarde van r* **NPR**	**A** **A** **A** **CA** **OR/*OF*** **A** **A** **A** **CA** **OR/*OF*** **A** **A** **A** **CA** **NPR** (4)
5.2	$A = P(1 - i)^n$ $= R\,220\,000\,(1 - 0,23)^3$ $= R100\,437,26$ **OR/*OF*** Year/*Jaar* 1 : $220\,000 - 0,23 \times 220\,000 = R169\,400$ Year/*Jaar* 2 : $169\,400 - 0,23 \times 169\,400 = R130\,438$ Year/*Jaar* 3 : $130\,438 - 0,23 \times 130\,438 = R100\,437,26$	✓**F** ✓**SF** ✓ value/*waarde* **OR/*OF*** ✓R169 400 ✓R130 438 ✓ R100 437,26 **NPR**	**A** **A** **CA** **OR/*OF*** **A** **CA** **CA** (3)

Please turn over/Blaai om asseblief

MA HENDRICKS
External Moderator
UMALUSI

B.J Thabe

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025

5.3 #	Value of investment at end of 4 years / *Waarde van die belegging aan die einde van 4 jaar:* $A = R40\,000\left(1+\frac{6{,}5\%}{4}\right)^{16}$ $\approx R\,51\,768{,}90$	✓ $40000\left(1+\frac{6{,}5\%}{4}\right)^{16}$ **A** ✓ R 51 768,90 **CA**
	Value of investment at end of 7 years/ *Waarde van die belegging aan die einde van 7 jaar* $A = R51\,768{,}90\left(1+\frac{8\%}{2}\right)^{6}$ $\approx R\,65\,504{,}17$	✓ $51768{,}90\left(1+\frac{8\%}{2}\right)^{6}$ **CA** ✓ R 65 504,17 **CA**
	∴ Interest / *Rente* ≈ R25 504,17	✓ R25 504,17 **CA**
	∴ $R\,25\,504{,}17 > \frac{1}{2}(R\,40\,000)$	
	∴ The interest earned was **NOT** less than half the original amount. */Die rente verdien was **NIE** minder as die helfte van die oorspronklike bedrag **NIE***	✓ conclusion/*gevolgtrekking* **CA**
	OR/*OF*	**OR/*OF***
	$A = R40\,000\left(1+\frac{6{,}5\%}{4}\right)^{16}\times\left(1+\frac{8\%}{2}\right)^{6}$ $\approx R\,65\,504{,}17$	✓ $40000\left(1+\frac{6{,}5\%}{4}\right)^{16}$ **A** ✓**M** ✓ $\times\left(1+\frac{8\%}{2}\right)^{6}$ **A** ✓ R65 504,17 **CA**
	∴ Interest / *Rente* ≈ R25 504,17	✓ R25 504,17 **CA**
	∴ $R\,25\,504{,}17 > \frac{1}{2}(R\,40\,000)$	
	∴ The interest earned was **NOT** less than half the original amount./*Die rente verdien was **NIE** minder as die helfte van die oorspronklike bedrag **NIE***	✓ conclusion/*gevolgtrekking* **CA** (6) **NPR** **[14]**

QUESTION/*VRAAG* 6

6.1	$f(x) = -8x$ $f'(x) = \lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$ $= \lim_{h\to 0}\frac{-8(x+h)-(-8x)}{h}$ $= \lim_{h\to 0}\frac{-8x-8h+8x}{h}$ $= \lim_{h\to 0}\frac{-8h}{h}$ $= \lim_{h\to 0}(-8)$ $\therefore f'(x) = -8$	✓definition/*definisie* ✓ **SF** ✓ **S** ✓**S** ✓ -8 **Penalty: 1 mark for incorrect notation/** ***Penaliseer : 1 punt vir foutiewe notasie*** **AO: only 1 mark/** ***slegs 1 punt***	**A** **A** **CA** **CA** **CA** (5)
6.2	$D_x[-2]$ $= 0$	✓ 0	**A** (1)
6.3	$f(x) = x^{\frac{3}{2}} - 4x^{-7}$ $f'(x) = \frac{3}{2}x^{\frac{1}{2}} + 28x^{-8}$	✓ $\frac{3}{2}x^{\frac{1}{2}}$ ✓ $28x^{-8}$	**A** **A** (2)
6.4.1	$y - yx = x^2 - 1$ $y(1-x) = (x-1)(x+1)$ $y = \frac{(x-1)(x+1)}{-(x-1)}$ $y = -x-1$ **OR/*OF*** $y - yx = x^2 - 1$ $-y(x-1) = (x-1)(x+1)$ $-y = \frac{(x-1)(x+1)}{(x-1)}$ $-y = x+1$ $y = -x-1$	✓ factor LHS/*faktor LK* ✓ factors RHS/*faktore RK* ✓ divide by /*deel deur* $(1-x)$ ✓ **S** **OR/*OF*** ✓ factor LHS/*faktor LK* ✓ factors RHS/*faktore RK* ✓ divide by /*deel deur* $(x-1)$ ✓ **S**	**A** **A** **CA** **CA** **A** **A** **CA** **CA** (4)
6.4.2	$\frac{dy}{dx} = -1$	✓ -1	**CA** (1)

Please turn over/Blaai om asseblief

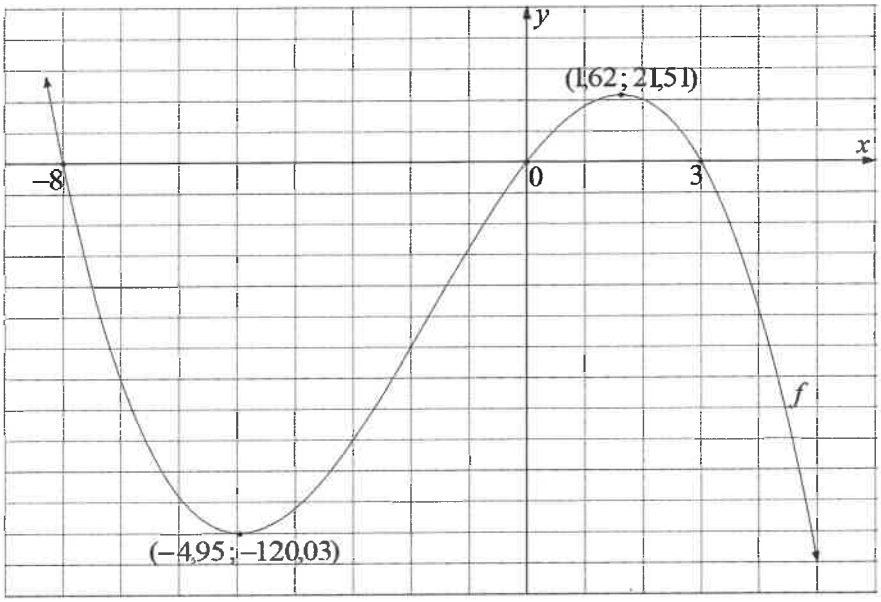
MA HENDRICKS
External Moderator
UMALUSI

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025

6.5.1	$g'(x) = 6x + 5$	✓ $6x$ ✓ 5	**A** **A** (2)
6.5.2	$g'(-4) = 6(-4) + 5 = -19$	✓grad value/*waarde*	**CA** (1)
6.5.3 #	$g(-4) = 3(-4)^2 + 5(-4) = 28$ $y = -19x + c$ **OR/*OF*** $y - y_1 = -19(x - x_1)$ $28 = -19(-4) + c$ $y - 28 = -19[x - (-4)]$ $-48 = c$ $y - 28 = -19x - 76$ $y = -19x - 48$	✓ 28 ✓ **SF** ✓ Eqn of tangent/*vergl van raaklyn*	**A** **CA** **CA** (3)
6.6	Av. Grad./ *Gemid.grad.* $= \frac{y_2 - y_1}{x_2 - x_1}$ $5 = \frac{k - 3 - (-6)}{k - 1}$ **OR/*OF*** $5 = \frac{-6 - (k - 3)}{1 - k}$ $5k - 5 = k + 3$ $5 - 5k = -3 - k$ $4k = 8$ $-4k = -8$ $\therefore k = 2$	✓ **SF** ✓ **S** ✓value of/ waarde van k	**A** **CA** **CA** (3)
			[22]

QUESTION/*VRAAG* 7

7.1	$y = 0$ **OR/*OF*** $(0;0)$	✓ *y*- intercept/*afsnit* **A** (1)
7.2	$g(x) = -x^3 - 5x^2 + 24x$ $= -x(x^2 + 5x - 24)$ $= -x(x+8)(x-3)$ **OR/*OF*** $g(x) = -x^3 - 5x^2 + 24x$ $= x(-x^2 - 5x + 24)$ $= x(-x-8)(x-3)$ **OR/*OF*** $= x(x+8)(-x+3)$	✓ common factor/*gemene faktor* **A** ✓ further factorisation/*verdere faktorisering* **CA** **OR/*OF*** ✓ common factor/*gemene faktor* **A** ✓ further factorisation/*verdere faktorisering* **CA** (2)
7.3	$x = 0$ or/*of* $x = -8$ or/*of* $x = 3$	✓ all 3 *x*-intercepts/ al 3 *afsnitte* **CA** (1)
7.4 #	$f'(x) = -3x^2 - 10x + 24 = 0$ $x = \dfrac{-(-10) \pm \sqrt{(-10)^2 - 4(-3)(24)}}{2(-3)}$ $\therefore x \approx 1,62$ or/*of* $x \approx -4,95$ $f(1,62) = -(1,62)^3 - 5(1,62)^2 + 24(1,62) \approx 21,51$ $f(-4,95) = -(-4,95)^3 - 5(-4,95)^2 + 24(-4,95) \approx -120,03$ $\therefore (1,62\ ;\ 21,51)$ and/*en* $(-4,95\ ;\ -120,03)$	✓derivative/*afgeleide* **A** ✓ $f'(x) = 0$ **A** ✓**SF** **CA** ✓both values of/*beide waardes van x* **CA** ✓ both values of/*beide waardes van y* **CA** **AO: Full marks/*Volpunte*** **NPR** (5)

7.5		✓ shape/*vorm* **A** ✓ *x*- and *y*-intercepts/*x*- en *y-afsnitte* **CA** ✓ both turning points/*beide draaipunte* **CA** (3)
7.6	$x < -4,95$ or/*of* $0 < x < 1,62$ **OR/*OF*** $x \in (-\infty ; -4,95) \cup (0 ; 1,62)$ **OR/*OF*** $x < -4,95$ or/*of* $x > 0$ and/*en* $x < 1,62$	✓ $x < -4,95$ **CA** ✓✓ $0 < x < 1,62$ **CA** **OR/*OF*** ✓ $x \in (-\infty ; -4,95)$ **CA** ✓✓ $\cup (0 ; 1,62)$ **CA** **OR/*OF*** ✓ $x < -4,95$ **CA** ✓✓ $x > 0$ and/*en* $x < 1,62$ **CA** (3) **[15]**

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

MA HENDRICKS
External Moderator
UMALUSI

QUESTION/*VRAAG* 8

8.1	$x+1$ Accept/ *Aanvaar*: $\frac{2x+2}{2}$ **OR/*OF*** $\frac{1}{2}(2x+2)$	✓ height/*hoogte* **A** (1)
8.2	$V(x)=(10-2x)(2x+2)(x+1)$ $=(10-2x)(2x^2+4x+2)$ **OR/*OF*** $(2x+2)(-2x^2+8x+10)$ **OR/*OF*** $(x+1)(-4x^2+16x+20)$ $\therefore V(x)=-4x^3+12x^2+36x+20$	✓ **SF** **CA** ✓trinomial/*drieterm* **CA** (2)
8.3	$V'(x)=-12x^2+24x+36$	✓ derivative/*afgeleide* **A** (1)
8.4	For maximum/*Vir maksimum*: $V'(x)=0$ $-12x^2+24x+36=0$ $-x^2+2x+3=0$ **OR/*OF*** $x^2-2x-3=0$ $-(x-3)(x+1)=0$ **OR/*OF*** $(x-3)(x+1)=0$ **OR/*OF*** $x=\frac{-(2)\pm\sqrt{(2)^2-4(-1)(3)}}{2(-1)}$ **OR/*OF*** $x=\frac{-(-2)\pm\sqrt{(-2)^2-4(1)(-3)}}{2(1)}$ $\therefore\ x=3$ or/*of* $x=-1$ $\therefore\ x=3$	✓ equating derivative to/*stel afgeleide aan* 0 **A** ✓factors/*faktore*/**SF** **CA** ✓both values of/*beide waardes van* x **CA** ✓ applicable value of/ *toepaslike waarde van* x **CA** (4) **[8]**

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
23 -05- 2025
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

MA HENDRICKS External Moderator UMALUSI

QUESTION/*VRAAG* 9

9.1	$\int -5x^9\ dx$ $= -\frac{1}{2}x^{10} + C$ Accept/ *Aanvaar*: $-\frac{5}{9+1}x^{9+1} + C$	✓ $-\frac{1}{2}x^{10}$ **A** ✓ **C** **A** (2)
9.2.1	$\frac{2 - 8x^{-3} + x}{x}$ $= \frac{2}{x} - 8x^{-4} + 1$	✓ $-8x^{-4}$ **A** ✓ 1 **A** (2)
9.2.2	$\int \frac{2}{x} - 8x^{-4} + 1\ dx$ $= 2\ln x + \frac{8}{3}x^{-3} + x + C$	✓ $2\ln x$ **A** ✓ $\frac{8}{3}x^{-3}$ **CA** ✓ x **CA** (3)
9.3	$A = \int_k^{2k} f(x)\ dx$ $= \int_k^{2k} 4x^3\ dx$ $= \left[x^4\right]_k^{2k}$ **OR/*OF*** $= \left[\frac{4x^{3+1}}{3+1}\right]_k^{2k}$ $(2k)^4 - (k)^4 = 36\ 015$ $15k^4 = 36\ 015$ $k^4 = 2\ 401$ $k = \sqrt[4]{2\ 401} = 7$ $\therefore 2k = 14$ $\therefore 10 < 2k < 20$ $\therefore$ The claim is **VALID** / $\therefore$ *Die bewering is* ***GELDIG.***	✓Area notation using integrals/*Oppervlak-notasie met gebruik van integrale* **A** ✓ x^4 **A** ✓ subst./*vervang.* **CA** ✓ A = 36 015 **CA** ✓ **S** **CA** ✓value of/*waarde van k* **CA** ✓Conclusion/*Gevolgtr* **CA** (7) **[14]**

TOTAL/*TOTAAL*: 150

MA HENDRICKS
External Moderator
UMALUSI