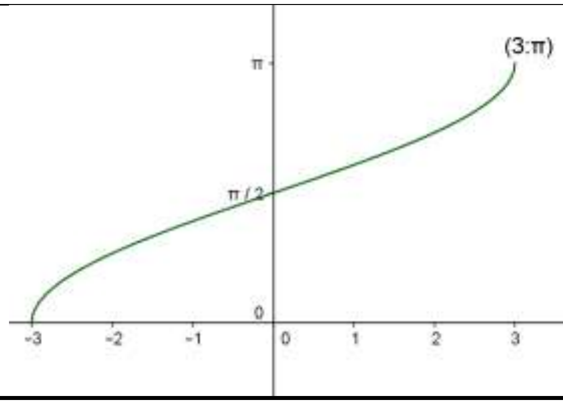
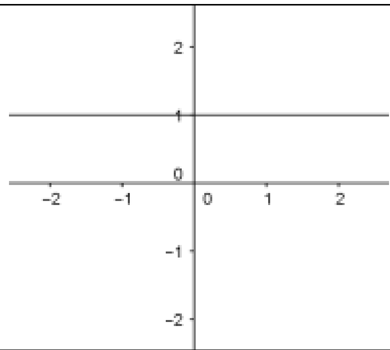
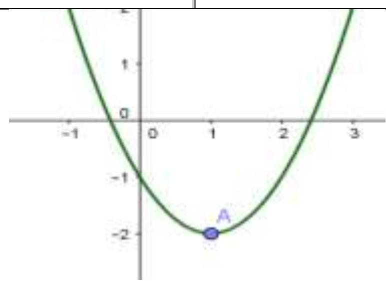
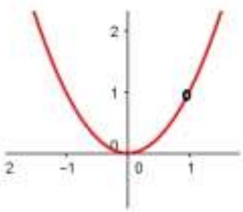
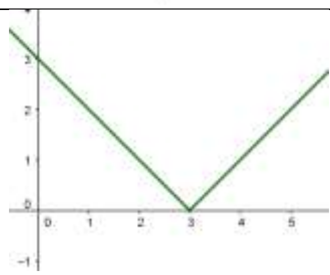
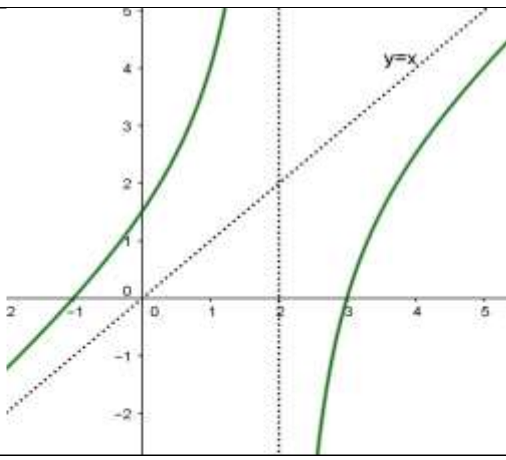
Vraag	Antwoord	Puntetoekenning	Punt
	Afdeling A: Multikeuse [20]		
	1. A 2. B 3. D 4. A 5. D 6. B 7. D 8. C 9. C 10. A	2 2 2 2 2 2 2 2 2 2	20
	Afdeling B [180]		
	Vraag 1 [17]		
1.1a	A(-1;0) E(7:0)	2P 2P	4
1.1b	B(3;-4)	2P	2
1.1c	$x-7=-x^2+4x-3$ $x^2-3x-4=0$ $x=4$ of $x=-1$ F(4;-3)	1P 1P 1P 1P	4
1.2a	$tan\alpha=\frac{2x}{x}=2$ $\therefore \alpha=1{,}11$	1P 1P	2
1.2b	$\theta=\frac{\pi}{2}-1{,}11$ $\therefore \theta=0{,}46$	1P 1P	2
1.2c	Opp sektor AOB= $\frac{1}{2}(5^2)(0{,}46)$ $=5{,}75$	2P 1P	3
	Vraag 2 [24]		
2.1	Stel n=1: LK = 1 RK =1 ,∴ waar vir n=1 Aanvaar waar vir n = k: $1+3+5+\cdots+(2k-1)=k^2$ Stel n = k+1: LK $=1+3+5+\cdots+(2k-1)+(2k+1)$ $=k^2+2k+1$ RK $=(k+1)^2$ $=k^2+2k+1$ LK=RK ∴Bewering waar vir n=1. As dit waar is vir n=k, is dit ook waar vir n=k+1. Dus waar vir alle $n\in N$	2P: LK en RK 1P: aanvaar 1P: stelling met k 1P: stel n=k+1 2P: LK en laaste term 1P: vervang 1P: RK 1P: storie	10
2.2	Indien $x=1+i$ 'n wortel is van P(x), sal $x=1-i$ ook 'n wortel wees. $\therefore (x-1-i)(x-1+i)$ is 'n faktor van $P(x)$ $=x^2-2x+2$ $\therefore P(x)=(x^2-2x+2)(x+3)$ $\therefore x=-3$	1P: ander wortel 1P: hakies 1P: vereenvoudig 1P: $x+3$ 1P:antwoord	5

Vraag	Antwoord	Puntetoekenning	Punt
2.3a	$a = 2cis\frac{\pi}{3}$ $b = 2cis\frac{-\pi}{3}$	2P: a 2P: b	4
2.3b	$\frac{a}{b^2} = \frac{2cis\frac{\pi}{3}}{2^2cis\left(\frac{-2\pi}{3}\right)}$ $= \frac{1}{2}cis\left(\frac{\pi}{3} - \left(\frac{-2\pi}{3}\right)\right)$ $= \frac{1}{2}cis(\pi)$ $= \frac{-1}{2} \in \mathbb{R}$	2P 1P 1P 1P	5
Vraag 3 [25]			
3.1	$\lvert A\rvert = \begin{vmatrix} b & 3b \\ 2b & -b \end{vmatrix}$ $= -b^2 - 6b^2 = -7b^2$ $\lvert A_x\rvert = \begin{vmatrix} -1 & 3b \\ 5 & -b \end{vmatrix}$ $= b - 15b = -14b$ $x = \frac{-14b}{-7b^2} = \frac{2}{b} = 2$ $\therefore b = 1$	1P: determinant 1P: matriks 1P: determinant 1P: berekening 1P: antwoord	5
3.2	$\binom{10}{4}(-2x)^6\left(\frac{1}{x}\right)^4$ $= 210(64x^6)\left(\frac{1}{x^4}\right)$ $= 13440x^2$	3P 3P 1P	7
3.3a	$\frac{-\pi}{2} \leq x - \frac{\pi}{2} \leq \frac{\pi}{2}$ $0 \leq x \leq \pi$	1P 2P	3
3.3b	$x = 3sin\left(y - \frac{\pi}{2}\right)$ $f^{-1}(x) = bgsin\frac{x}{3} + \frac{\pi}{2}$	1P: ruil x en y om 3P	4

Vraag	Antwoord	Puntetoekenning	Punt
3.3c		2P: beginpunt 1P: eindpunt 1P: y-afsnit 2P: vorm	6
	Vraag 4 [26]		
4.1	$f(x+h)-f(x)=\frac{-2}{x+h}-\frac{-2}{x}$ $=\frac{-2x+2(x+h)}{x(x+h)}$ $f'(x)=\lim_{h\to 0}\ \frac{-2x+2x+2h}{hx(x+h)}=\lim_{h\to 0}\ \frac{2h}{hx(x+h)}=\lim_{h\to 0}\ \frac{2}{x(x+h)}$ $=\frac{2}{x^2}$	1P: stap 1 1P: een noemer 2P: vereenvoudig 1P: antwoord	5
4.2a	$h'(x)=\frac{2.\frac{\frac{1}{3}(2x)^{\frac{-2}{3}}}{1+\left(\sqrt[3]{2x}\right)^2}}{\sqrt{1-\left(bgtan\left(\sqrt[3]{2x}\right)\right)^2}}$	1P: $\frac{1}{3}$ 1P: $(2x)^{\frac{-2}{3}}$ 1P: $1+\left(\sqrt[3]{2x}\right)^2$ 1P: 2 1P: noemer	5
4.2b	$\frac{[e^x lnx+e^x\frac{1}{x}]x-1(e^x lnx)}{x^2}$	6P	6
4.3	$\frac{1}{2}(lny)^{\frac{-1}{2}}.\frac{1}{y}.\frac{dy}{dx}=5-y^{-2}\frac{dy}{dx}$ $\frac{dy}{dx}=\frac{5}{\frac{1}{2}(lny)^{\frac{-1}{2}}.\frac{1}{y}+y^{-2}}$	7P 3P	10

Vraag	Antwoord	Puntetoekenning	Punt
Vraag 5 [18]			
5.1a		2P	2
5.1b		2P	2
5.1c		2P	2
5.1d		2P	2
5.2	$g'(x) = 2(f(x) + 1).f'(x)$ $g'(0) = 2(1 + 1)(2)$ $= 8$	2P: differensiasie 2P: vervanging 1P: antwoord	5
5.3	$f'(x) = 3cosx - 2sec^2x$ $x_{n+1} = x_n - \frac{3sinx_n - 2tanx_n}{3cosx_n - 2sec^2x_n}$ $x \approx 0{,}8411$	1P: afg 2P: formule (nie nodig)(CA) 2P: antw	5

Vraag	Antwoord	Puntetoekenning	Punt
	Vraag 6 [21]		
6.1	Stel $h(x) = e^x - (e^{x+1} - 1)^2$ $h'(x) = e^x - 2(e^{x+1} - 1)e^{x+1} = 0$ $\therefore e^x - 2e^{2x+2} + 2e^{x+1} = 0$ $\therefore e^x(1 - 2e^{x+2} + 2e) = 0$ $\therefore e^x = 0$ n.v.t. Of $2e^{x+2} = 1 + 2e$ $e^x = 0{,}435 \ldots$ $\therefore x = ln 0{,}435 \ldots$ $= -0{,}83$	1P 1P: afgeleide 1P: =0 1P: vereenvoudiging 1P: $e^x = 0$ 1P 1P 1P 1P	9
6.2a	Vertikaal: $x = 2$ Skuins: $y = x$	2P 2P	4
6.2b		2P: x-afsnitte 1P: y-afsnit 2P: $y = x$ 1P: $x = 2$ 2P: vorm	8
	Vraag 7 [23]		
7.1	$\dfrac{sec\,(2x-5)}{2} + \dfrac{(2x-5)^4}{4.2} + k$	5P	5
7.2	Stel $f(x) = 2x + 1$ en $g'(x) = e^{2x+1}$ $\therefore f'(x) = 2$ en $g(x) = \frac{e^{2x+1}}{2}$ $\therefore \int (2x+1).e^{2x+1}\ dx = (2x+1)\dfrac{e^{2x+1}}{2} - \int 2.\dfrac{e^{2x+1}}{2}\ dx$ $= (2x+1)\dfrac{e^{2x+1}}{2} - \dfrac{e^{2x+1}}{2} + k$	2P 2P 2P	6
7.3a	$\frac{3x^2+18}{x^2(x^2+9)} \equiv \frac{A}{x^2} + \frac{B}{x^2+9}$ $3x^2 + 18 = A(x^2 + 9) + Bx^2$ $= Ax^2 + 9A + Bx^2$ $3 = A + B$ en $18 = 9A$ $A = 2$ $B = 1$	 2P 2P 1P 1P	6

Vraag	Antwoord	Puntetoekenning	Punt
7.3b	$2\int x^{-2}dx + \int \frac{dx}{9+x^2}$		6
	$= -2x^{-1} + \frac{3}{1}.\frac{1}{9}\int \frac{\frac{1}{3}}{1+\left(\frac{x}{3}\right)^2}dx$	4P	
	$= -2x^{-1} + \frac{1}{3}bgtan\left(\frac{x}{3}\right) + k$	2P	
	Vraag 8 [26]		
8.1	$\Delta x_i = \frac{2}{n}$	1P	**10**
	$x_i = -1 + \frac{2i}{n}$	1P	
	$f(x_i) = -\left(-1+\frac{2i}{n}\right)^2 + 1$	1P	
	$= \frac{4i}{n} - \frac{4i^2}{n^2}$	1P	
	$f(x_i).\Delta x_i = \left(\frac{2}{n}\right)\left(\frac{4i}{n} - \frac{4i^2}{n^2}\right)$	1P	
	$= \frac{8i}{n^2} - \frac{8i^2}{n^3}$	1P	
	$\sum_{i=1}^{n} f(x_i).\Delta x_i = \frac{8}{n^2}\sum_{i=1}^{n} i - \frac{8}{n^3}\sum_{i=1}^{n} i^2$	1P	
	$= \frac{8}{n^2}\left(\frac{n^2}{2}+\frac{n}{2}\right) - \frac{8}{n^3}\left(\frac{n^3}{3}+\frac{n^2}{2}+\frac{n}{6}\right)$	1P	
	$\lim_{n\to\infty}\sum_{i=1}^{n} f(x_i).\Delta x_i = 4 - \frac{8}{3} = \frac{4}{3}$	2P	
8.2	Stel $u = ln\,(x-1) \quad \therefore \frac{du}{dx} = \frac{1}{x-1}$	1P	10
	$\int \frac{cos\,(ln(x-1))}{x-1}\,dx = \int cosu\,du$	1P	
	$= sinu$	1P: integrasie	
	$\therefore \int_2^a \frac{cos\,(ln(x-1))}{x-1}\,dx = sin(ln(x-1))\Big\|_2^a$		
	$sin(ln(a-1)) - sin\,(ln1)$	2P: vervanging	
	$= sin(ln(a-1)) = \frac{1}{2}$	1P: vereenvoudig	
	$bgsin\left(\frac{1}{2}\right) = ln\,(a-1)$	1P	
	$\frac{\pi}{6} = ln\,(a-1)$	1P	
	$e^{\frac{\pi}{6}} = a - 1 \qquad \therefore a = e^{\frac{\pi}{6}} + 1$	2P	

Vraag	Antwoord	Puntetoekenning	Punt
8.3	Vol= $\pi\int_0^{\frac{\pi}{6}}(2tanx)^2 dx+\pi\int_{\frac{\pi}{6}}^{\frac{\pi}{3}}(secx)^2\, dx$	6P	6