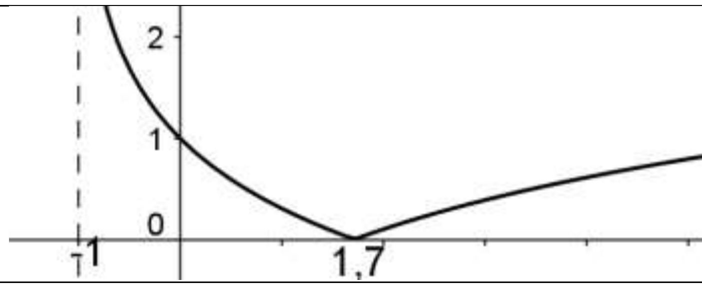
Vraag	Antwoord	Puntetoekenning	Punt

Afdeling A: Multikeuse

	1.1 A 1.2 B 1.3 C 1.4 C 1.5 D 1.6 B 1.7 A 1.8 C 1.9 B 1.10 D	2 2 2 2 2 2 2 2 2 2	20

VRAAG 1 ANTWOORDBLAD

Vraag	1	2	3	4	5	6	7	8	9	10
	★	A	A	A	A	A	★	A	A	A
	B	★	B	B	B	★	B	B	★	B
	C	C	★	★	C	C	C	★	C	C
	D	D	D	D	★	D	D	D	D	★

	Afdeling B		
	Vraag 2 [23]		
2.1	$0{,}9 = 1 - e^{-\frac{4{,}6}{a}}$ $e^{-\frac{4{,}6}{a}} = 0{,}1$ $-\frac{4{,}6}{a} = \ln(0{,}1)$ $a = 2$	1: Vervang 1:Kry e alleen 1: neem ln 1:Antwoord	4
2.2a	$y = \|\ln(0+1) - 1\| = 1$ $\|\ln(x+1) - 1\| = 0$ $\ln(x+1) = 1$ $x + 1 = e^1$ $x = 1{,}7$ Asimptoot: $x = -1$	1:Stelx=0; 1: Ant 1: Stel y=0 1: Uit absolute waarde 1: Neem e 1: Antwoord 1: Asimptoot	7
2.2 b		1: x afsnit (CA) 1: y-afsnit (CA) 1: asimptoot (CA) 2: vorm	5
2.3	$x = 2 \pm \sqrt{5}$; $(x-2)^2 = \left(\pm\sqrt{5}\right)^2$; $x^2 - 4x - 1$ faktor Of $x = 2 \pm \sqrt{5}$; $\left(x - 2 + \sqrt{5}\right)\left(x - 2 - \sqrt{5}\right) = x^2 - 4x - 1$ Dus $(x^2 - 4x - 1)(x^2 - 2x - 2)$	4 3: 2'e faktor	7

Vraag 3 [24]			
3.1 a	$\binom{6}{0}(2x)^6+\binom{6}{1}(2x)^5(-x^2)^1+\cdots$ $=64x^6-192x^7$	2 2	4
3.1 b	$(1-x)^{\frac{1}{2}}=$ $1+\frac{1}{2}(-x)+\frac{\frac{1}{2}.-\frac{1}{2}}{2}(-x)^2+\cdots.$ $=1-\frac{1}{2}x-\frac{1}{8}x^2$	1: mag 3:elke term 2:laaste 2 terme	6
3.1 c	$-192\times 1+64\times -\frac{1}{2}=-224$	2: 1 vir elke term; 1: antwoord	3
3.2	Stel n=1: LK = 6 RK =6 ,∴ waar vir n=1 Aanvaar waar vir n = k: $6+3+\frac{3}{2}+\cdots+6\left(\frac{1}{2}\right)^{k-1}=12(1-\frac{1}{2}^k)$ Stel n = k+1: $\text{LK}=12(1-\frac{1}{2}^k)+6.\frac{1}{2}^k$ $=12-12.\frac{1}{2}^k+6.\frac{1}{2}^k$ $=12-6.\frac{1}{2}^k$ RK = $12\left(1-\frac{1}{2}\right)^{k+1}$ $=12-12.\frac{1}{2}.\frac{1}{2}^k=12-6.\frac{1}{2}^k$ ∴Bewering waar vir n=1. As dit waar is vir n=k, is dit ook waar vir n=k+1. Dus waar vir alle $n\in N$	2: LK en RK 1: aanvaar 1: stelling met k 1: stel n=k+1 2: LK en laaste term 1: vereenvoudig 1: RK 1: vereenvoudig 1P: storie	11

Vraag 4 [20]			
4.1 a	$\begin{pmatrix} a+1 & -1 \\ a & 1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 11 \\ 9 \end{pmatrix}$	3: 1 elke matriks	3
4.1 b	$\lvert A\rvert = \begin{vmatrix} a+1 & -1 \\ a & 1 \end{vmatrix} = a+1+a = 2a+1$ $\lvert A_x\rvert = \begin{vmatrix} 11 & -1 \\ 9 & 1 \end{vmatrix} = 11+9 = 20$ $\lvert A_y\rvert = \begin{vmatrix} a+1 & 11 \\ a & 9 \end{vmatrix} = -2a+9$ $\therefore x = \frac{20}{2a+1}$ en $y = \frac{-2a+9}{2a+1}$	3: A 3: A_x 2: x	8
41 c	$\frac{20}{2a+1} = 4$ $20 = 8a+4,\ a = 2$	1: vervang x 1: Los op 1: antwoord	3
4.2	$r = \sqrt{2}$ en $\theta = \frac{3\pi}{4}$ $\sqrt{2}^8 cis(\frac{3\pi}{4} \times 8)$ $x = 16$ en $y = 0$	1: r en 1: θ 2 2	6

Vraag 5 [16]			
5.1a	$OC = rcos\theta;\ CA = r - rcos\theta;\ \therefore DC = r - rcos\theta$ $CB = rsin\theta;$ dus $BD = rsin\theta - r + rcos\theta$	1: OC; 1: CA; 1: DC 1: CB; 1: BD	5

5.1 b	$BD = 12cos1 + 12sin1 - 12$= 4,58 AD = $(12 - 12cos1) \times \frac{\pi}{2} = 8{,}67$ BA = $12 \times 1 = 12$ Omtrek = 25,25	1: BD 1: AD 1: BA 1: omtrek	4
5.2 a	$x = 2\sin\left(y - \frac{\pi}{3}\right) + 1$ $\frac{x-1}{2} = \sin(y - \frac{\pi}{3})$ $y = bgsin\left(\frac{x-1}{2}\right) + \frac{\pi}{3}$	1: ruil x en y 1: sin alleen 1: bgsin 1: $\pi/3$	4
5.2b	Sak $\frac{\pi}{4}$: Dus $y = \frac{\pi}{4}$ of $y = -\frac{3\pi}{4}$	3	3
Vraag 6 [24]			
6.1 a	$\frac{1}{\sqrt{1-e^{2x}}}.e^x$	3	3
6.1 b	$10(x^4-2x)^9(4x^3-2) \times \cot(2x) + (x^4-2x)^{10} \times (-cosec^2 2x).2$	5	5
6.2	$\cos\left(\frac{x}{y}\right).\frac{y - x.(\frac{dy}{dx})}{y^2} = 2y.\frac{dy}{dx} - 0$ $$\frac{dy}{dx} = \frac{\frac{\cos\left(\frac{x}{y}\right)}{y}}{\frac{x}{y^2}.\cos\left(\frac{x}{y}\right) + 2y}$$	6 1: antwoord	7

6.3a	$f(x) = (1-x^2)^{\frac{1}{2}} + x.bgsinx$ $f'(x) = \frac{1}{2}(1-x^2)^{-\left(\frac{1}{2}\right)}.(-2x) + bgsinx + \frac{x}{\sqrt{1-x^2}}$ $= \frac{-x}{\sqrt{1-x^2}} + bgsinx + \frac{x}{\sqrt{1-x^2}}$	5 1	6
6.3b	$\frac{\sqrt{1-(2x)^2}}{2} + 2x.bgsin2x.\frac{1}{2} + k$	3	3
Vraag 7 [15]			
7.1a	$x = 1$, want $\lim_{x \to 1^-} f(x) \neq \lim_{x \to 1^+} f(x)$	1: waarde 2: rede	3
7.1 b	Nee, nie kontinu	2	2
7.2	$f'(x) = 3x^2 + 2ax + b$ $f''(x) = 6x + 2a$ $f''(-1) = 0$, dus $a = 3$ $f'(-1) = 0$, dus $b = 3$	1 1 2 2	6
7.3	$a = 2$; $b = 1$; $c = -2$; $d = 1$	4	4

	Vraag 8 [23]		
8.1	$\int \sec^2 x - 1 + secxtanx\, dx$ = $tanx - x + secx + k$	4	4
8.2	$\frac{1}{3}\int \frac{1}{\sqrt{(1-\left(\frac{4x}{3}\right)^2}} dx$ = $\frac{1}{3} bgsin\left(\frac{4}{3}x\right).\frac{3}{4} + k$	2 3	5
8.3	$\frac{2}{(x-1)(2x-1)} = \frac{A}{x-1} + \frac{B}{2x-1}$ $2 = A(2x-1) + B(x-1)$ $A = 2$ en B= -4 $\int \frac{2}{x-1} + \frac{4}{2x-1} dx$= $2ln\|x-1\| + 4ln\|2x-1\|.\frac{1}{2} + k$	1 1 2 1 3	8
8.4	Stel $f(x) = x$ en $g'(x) = e^x$ Dus $f'(x) = 1$ en $g(x) = e^x$ $x.e^x - \int e^x\, dx$ = $xe^x - e^x + k$	2 2 2	6
	Vraag 9 [13]		
9.1 a	Opp = $\int_p^{\frac{\pi}{2}} cosx\, dx$ = $sinx \Big\|_p^{\frac{\pi}{2}}$ = $\sin\left(\frac{\pi}{2}\right) - sinp$ = $1 - sinp$	1 1 2	4
9.1 b	Opp CBAO = $p \times cosp$ Dus $p \times cosp = 1 - sinp$	1 1	2

9.2	$f'(x) = \sec^2 2x\,.\,2 + 1$ $a_{n+1} = a_n - \frac{\tan(2a_n)+a_n-1}{\sec^2 2a_n.2+1}$ $x \approx 0{,}30401$	3 2 2	7
Vraag 10 [22]			
10.1	$\Delta x_i = \frac{2}{n}$ $x_i = \frac{2i}{n}$ $f(x_i) = 2.\frac{2i}{n} - \left(\frac{2i}{n}\right)^2$ $= \frac{4i}{n} - \frac{4i^2}{n^2}$ $f(x_i).\Delta x_i = \left(\frac{2}{n}\right)\left(\frac{4i}{n} - \frac{4i^2}{n^2}\right)$ $= \frac{8i}{n^2} - \frac{8i^2}{n^3}$ $\sum_{i=1}^{n} f(x_i).\Delta x_i = \frac{8}{n^2}\sum_{i=1}^{n} i - \frac{8}{n^3}\sum_{i=1}^{n} i^2$ $= \frac{8}{n^2}\left(\frac{n^2}{2} + \frac{n}{2}\right) - \frac{8}{n^3}\left(\frac{n^3}{3} + \frac{n^2}{2} + \frac{n}{6}\right)$ $\lim_{n\to\infty}\sum_{i=1}^{n} f(x_i).\Delta x_i = 4 - \frac{8}{3} = \frac{4}{3} = 1\frac{1}{3}$	1 1 1 1 1 1 1 2 3	12
10.2	Vol= $\pi\int_a^b (f(x))^2\,dx$ $= \pi\left[\int_0^d \left(\frac{2x+1}{x^2+1}\right)dx\right]$ $= \pi\left[\int_0^d \left(\frac{2x}{x^2+1}\right)dx + \int_0^d \left(\frac{1}{x^2+1}\right)dx\right]$ = $\pi[ln(x^2+1) + bgtanx]\Big\|_0^d$ = $\pi(ln(d^2+1) + bgtand)$ $\int_0^d \left(\frac{2x}{x^2+1}\right)dx$: Stel $u = x^2 + 1$, dus $du = 2x.dx$ $\int \frac{1}{u}du = lnu$	1 1 2 4 2	10