

α -MATHEMATICS

Alpha Wiskunde Graad 10 / *Alpha Mathematics Grade 10*

Kwartaal 3 Toets 2022 / *Term 3 Test 2022*

MEMORANDUM

Totaal / *Total*: 100 punte / *marks*

Eksaminator / *Examiner*: Lanice Liebenberg

Moderator: Anna Muller

Hierdie memorandum bestaan uit 6 bladsye. /

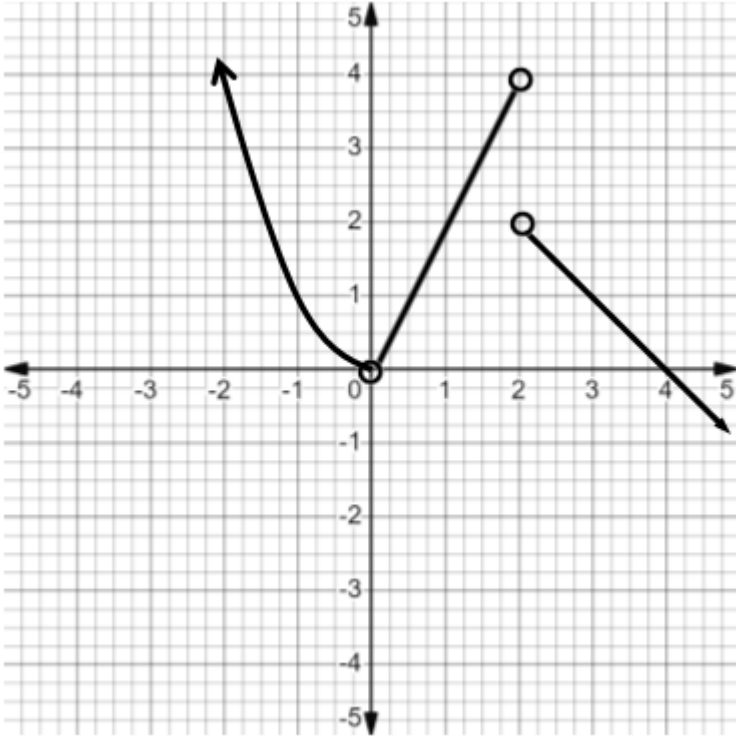
This memorandum consists of 6 pages.

Vraag / Question 1**[20 punte / marks]**

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

Vraag / Question 2

[27 punte / marks]

NR. NO	ANTWOORD / ANSWER	PUNTE / MARKS
2.1.1	$(f \circ g)(x) = \sqrt{\frac{1}{x} + 5}$	(2)
2.1.2	$(g \circ g)(x) = \frac{1}{\frac{1}{x}} = x$	(3)
2.1.3	$(g \circ f)(x) = \frac{1}{\sqrt{x+5}}$ $(g \circ f)(x) = \frac{1}{\sqrt{4+5}} = \frac{1}{3}$	(3)
2.1.4	$f(-6) = \sqrt{-6+5} = i$	(3)
2.2	$f(x) = \sqrt{x} + \frac{1}{\sqrt{x}}$ $g(x) = x^2 - 2$	(4)
2.3		<p>✓✓Marks for each graph with correct end points (6)</p>
2.4	$y = 2 \cos x$	(2)
2.5.1	$\sin \frac{\pi}{3} = \frac{\sqrt{3}}{2}$	(2)
2.5.2	$\arccos \frac{1}{\sqrt{2}} = \frac{\pi}{4}$	(2)

Vraag / Question 3

[17 punte / marks]

NR. NO	ANTWOORD / ANSWER	PUNTE / MARKS
3.1	$g'(x) = 150x^{14} - 12x^3 + 2$	(4)
3.2	$f'(x) = 4(6x - 3)^3(6)$ $= 24(6x - 3)^3$	(4)
3.3	$k(x) = 10x^{-5} + 3x^{\frac{1}{2}}$ $k'(x) = -50x^{-6} + \frac{3}{2}x^{-\frac{1}{2}}$ $k'(x) = -\frac{50}{x^6} + \frac{3}{2\sqrt{x}}$	(4)
3.4	$b(x) = 3(5x^3 + 2x^2 + 5)^{-3}$ $b'(x) = -9(5x^3 + 2x^2 + 5)^{-4}(15x^3 + 4x)$	(5)

Vraag / Question 4

[25 punte / marks]

NR. NO	ANTWOORD / ANSWER	PUNTE / MARKS
4.1	$\int (10\sqrt[3]{x} - \pi) dx$ $= \int (10x^{\frac{1}{3}} - \pi) dx$ $= \frac{10x^{\frac{4}{3}}}{\frac{4}{3}} - \pi x + c$ $= \frac{15x^{\frac{4}{3}}}{2} - \pi x + c$	(4)
4.2	$\int (t^4 + x^2t - 3xv^5) dt$ $= \frac{t^5}{5} + \frac{x^2t^2}{2} - 3xv^5t$	(4)
4.3	$\int 7x^5 dx$ $= \frac{7x^6}{6} + c$	(2)
4.4	$\int_{-1}^3 x^2 dx$ $= \frac{x^3}{3} \Big _{-1}^3$ $= \frac{27}{3} - \frac{-1}{3}$ $= \frac{28}{3}$	(4)
4.5	$\int_1^2 (3x - 1)^2 dx$ $= \int_1^2 (9x^2 - 6x + 1) dx$ $= \frac{9x^3}{3} - \frac{6x^2}{2} + x \Big _1^2$ $= 3x^3 - 3x^2 + x \Big _1^2$ $= (3(2)^3 - 3(2)^2 + 2) - (3(1)^3 - 3(1)^2 + 1)$ $= 13$	(6)

4.6	$\int_2^4 \frac{1}{x^3} dx$ $= \int_2^4 x^{-3} dx$ $= \frac{x^{-2}}{-2} \Big _2^4$ $= \frac{4^{-2}}{-2} + \frac{2^{-2}}{2}$ $= \frac{3}{32}$	(5)
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Vraag / Question 5

[11 punte / marks]

NR. NO	ANTWOORD / ANSWER	PUNTE / MARKS
5.1	$A = \int_0^4 (4x^3 + 3x^2 + 2x + 1) dx$ $= \frac{4x^4}{4} + \frac{3x^3}{3} + \frac{2x^2}{2} + x \Big _0^4$ $= 4^4 + 4^3 + 4^2 + 4$ $= 340$	(6)
5.2.	$V = \pi \int_0^2 [4\sqrt{x^3 + 1}]^2 dx$ $= 16\pi \int_0^2 (x^3 + 1) dx$ $= 16\pi \left(\frac{x^4}{4} + x \right) \Big _0^2$ $= 16\pi \left(\frac{2^4}{4} + 2 \right)$ $= 96\pi$	(5)

- EINDE VAN DIE MEMORANDUM / END OF THE MEMORANDUM -