

# **$\alpha$ -WISKUNDE/MATHEMATICS**

**Alpha Wiskunde Graad 10 / *Alpha Mathematics Grade 10***

**Maart toets 2024 / *March test 2024***

## **MEMORANDUM**

**Totaal / *Total*: 50 punte / *marks***

**Eksaminator / *Examiner*: Pieter van Onselen**

**Moderator: Lanice Liebenberg**

**Hierdie memorandum bestaan uit 6 bladsye. /  
*This memorandum consists of 6 pages.***

Vraag / Question 1

[10 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

Vraag / Question 1

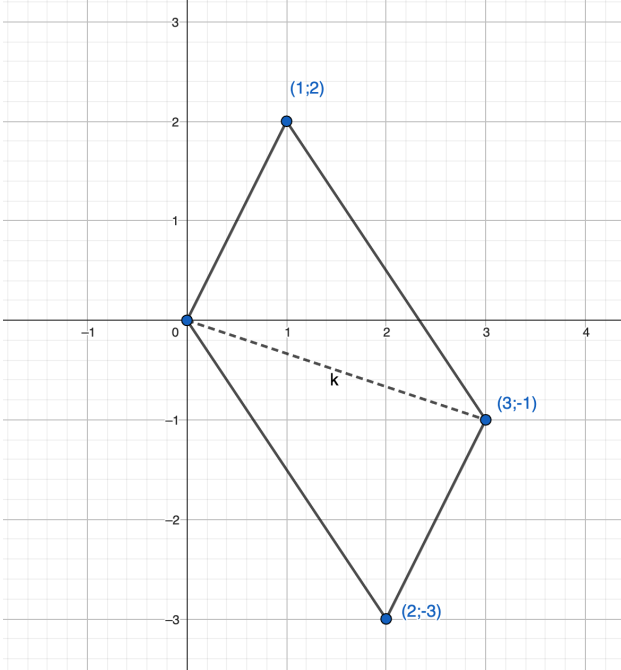
[10 punte / marks]

NR. NO.	ANTWOORD / ANSWER	PUNTE / MARKS
1.1	D $-\frac{2i}{i^2}$ $= 2i$	(2)
1.2	B $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$	(2)
1.3	B $-1 - 2i$	(2)
1.4	C $-x - 2 \equiv Ax^2 + Ax + Bx + B + Cx^2$ Vir/for $x$ : $-1 = A + B$ $-1 = A - 2$ $A = 1$	(2)
1.5	D $i(1 + ai) + 1$ $= i + ai^2 + 1$ $= i - a + 1$ Suiwer imaginêr/imaginary only $-a + 1 = 0$ $a = 1$	(2)

## Vraag / Question 2

[19 punte / marks]

NR. NO.	ANTWOORD / ANSWER	PUNTE / MARKS
2.1	$\sqrt{-64}$ $= 8i \checkmark \checkmark$	(2)
2.2(a)	$(1 - i) - (3 + 2i)$ $= -2 - 3i \checkmark \checkmark$	(2)
2.2(b)	$i^{41}(-1 + 5i)$ $= i \checkmark (-1 + 5i)$ $= -i + 5i^2 \checkmark$ $= -5 - i \checkmark$	(3)
2.2(c)	$Re(2 - i)^2$ $= Re(4 - 4i + i^2) \checkmark$ $= Re(4 - 4i + (-1)) \checkmark$ $= Re(3 - 4i) \checkmark$ $= 3 \checkmark$	(4)
2.2(d)	$\frac{1}{3 - i} \times \frac{3 + i}{3 + i} \checkmark$ $= \frac{3 + i}{9 - i^2} \checkmark$ $= \frac{3 + i}{9 - (-1)} \checkmark$ $= \frac{3}{10} + \frac{i}{10} \checkmark$	(4)

NR. NO.	ANTWOORD / ANSWER	PUNTE / MARKS
2.3		<p style="text-align: right;"><b>(4)</b></p> <p>(1; 2) ✓  (2; -3) ✓  (3; -1) ✓  Vorm/<i>shape</i> ✓</p>

Vraag / Question 3

[9 punte / marks]

NR. NO.	ANTWOORD / ANSWER	PUNTE / MARKS
3	$\frac{3x^2 + 2x + 2}{(x + 1)^2(x - 2)} \equiv \frac{A}{x + 1} + \frac{B}{(x + 1)^2} + \frac{C}{x - 2} \checkmark$ $3x^2 + 2x + 2 \equiv A(x - 2)(x + 1) + B(x - 2) + C(x + 1)^2 \checkmark$ $3x^2 + 2x + 2 \equiv Ax^2 - Ax - 2A + Bx - 2B + Cx^2 + 2Cx + C$ $x = 2 \checkmark$ $3(2)^2 + 2(2) + 2 = C(3)^2$ $18 = 9C$ $C = 2 \checkmark$ $x = -1 \checkmark$ $3(-1)^2 + 2(-1) + 2 = B(-1 - 2)$ $3 = -3B$ $B = -1 \checkmark$ $x = 0 \checkmark \quad \text{of/or} \quad \text{or/of}$ $2 = -2A - 2B + C \quad x^2: 3 = A + C \checkmark \quad x: 2 = -A + B + 2C \checkmark$ $2 = -2A + 2 + 2 \quad A = 1 \checkmark \quad 2 = -A - 1 + 4$ $-2 = -2A \quad A = 1 \checkmark$ $A = 1 \checkmark$ $\frac{3x^2 + 2x + 2}{(x + 1)^2(x - 2)} = \frac{1}{x + 1} - \frac{1}{(x + 1)^2} + \frac{2}{x - 2} \checkmark$	(9)

NR. NO.	ANTWOORD / ANSWER	PUNTE / MARKS
4.1(a)	Geen oplossing/ <i>No solution</i> ✓ Kolomme van matriks B is nie gelyk aan rye matriks A / <i>Columns of matrix B not equal to rows of matrix A</i> ✓	(2)
4.1(b)	$\begin{pmatrix} 0 & 2 \\ 1 & -1 \end{pmatrix} - \begin{pmatrix} 1 & -1 \\ 3 & -4 \end{pmatrix}$ ✓ $= \begin{pmatrix} -1 & 3 \\ -2 & 3 \end{pmatrix}$ ✓	(2)
4.1(c)	Geen oplossing/ <i>No solution</i> ✓ Dimensies matriks B is nie gelyk aan dimensies matriks A / <i>Dimensions matrix B is not equal to dimensions of matrix A</i> ✓	(2)
4.1(d)	$\begin{pmatrix} 1 & -1 \\ 3 & -4 \end{pmatrix} \times \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ ✓ $= \begin{pmatrix} 1-2 \\ 3-8 \end{pmatrix}$ $= \begin{pmatrix} -1 \\ -5 \end{pmatrix}$ ✓	(2)
4.1(e)	$c^T = \begin{pmatrix} 0 & 1 \\ 2 & -1 \end{pmatrix}$ ✓	(1)
4.2	$\begin{pmatrix} 2 & -2 \\ 4 & 6 \end{pmatrix} = \begin{pmatrix} 2 & 2b \\ 2a & 6 \end{pmatrix}$ ✓ $-2 = 2b$ $2a = 4$ $b = -1$ ✓ $a = 2$ ✓	(3)

**- EINDE VAN DIE MEMORANDUM / END OF THE MEMORANDUM -**