α-WISKUNDE/ MATHEMATICS

Junie/*June 2026* **Tyd/Time: $1\frac{3}{4}$ uur/*hour***

Graad/*Grade 10* **Totaal/Total: 100 PUNTE/*MARKS***

VRAAG/*QUESTION* 1 [18 PUNTE/*MARKS*]

1.1a)	$(5-2i)$✓$(3-4i)$ $=7$✓ $-26i$✓	1: $5-2i$ 1: 7 1: $-26i$ **[3]**
b)	$\frac{1}{i-7}$ x $\frac{i+7}{i+7}$✓ $=\frac{i+7}{i^2-49}$ ✓ $=\frac{i+7}{-50}$ ✓	1: $\frac{i+7}{i+7}$ 1: i^2-49 (Produk/*Product)* 1: -50 Noemer/*Denominator* **[3]**
1.2	LK/*LHS* $=-4$✓i✓ RK/*RHS* $=i^7-3i^9$✓ $=-i$✓ $-3i$✓ $=-4i$✓	1: -4 1: i 1: i^7-3i^9 1: $-i$ 1: $-3i$ 1: $-4i$ **[6]**

1.3	$7m + 3i = 2n - in$✓ $- 8$ $7m = 2n - 8$✓ en/*and* $3i = -in$✓ $\therefore n = -3$✓ Vervang/*Substitute* $n = -3$: $7m = 2(-3) - 8$✓ $m = -2$✓	1: $2n - in$ (Produk/*Product)* 1: $7m = 2n - 8$ (Reële dele/ *Real parts)* 1: $3i = -in$ (Im dele/*parts)* 1: $n = -3$ 1: Vervang/*Substitute* $n = -3$ 1: $m = -2$ **[6]**

VRAAG/*QUESTION* 2 [18 PUNTE/*MARKS*]

2.1	$\frac{x-13}{(x+2)(x-3)} = \frac{\mathrm{A}}{x+2} + \frac{\mathrm{B}}{x-3}$✓ $x - 13 = \mathrm{A}(x - 3) + \mathrm{B}(x + 2)$ ✓ Vervang/*Substitute* $x = -2$: $-2 - 13 = \mathrm{A}(-2 - 3) + \mathrm{B}(-2 + 2)$✓ $\mathrm{A} = 3$✓ Vervang/*Substitute* $x = 3$: $3 - 13 = \mathrm{A}(3 - 3) + \mathrm{B}(3 + 2)$✓ $\mathrm{B} = -2$✓ $\therefore \frac{x-13}{(x+2)(x-3)} = \frac{3}{x+2} - \frac{2}{x-3}$✓	1: Twee breuke met A en B/*Two fractions with A and B* 1: Maal KGV/*Multiply LCM* 1: Vervang/*Substitute* $x = -2$ 1: $\mathrm{A} = 3$ 1: Vervang/*Substitute* $x = 3$ 1: $\mathrm{B} = -2$ 1: Vervang A en B/ *Substitute A and B* **[7]**

2.2	$\frac{3x^2-2x+1}{x^2(x-1)} = \frac{A}{x} + \frac{B}{x^2} + \frac{C}{x-1}$ ✓ $3x^2 - 2x + 1 = Ax(x-1) + B(x-1) + Cx^2$ ✓ Vervang/*Substitute* $x = 0$: $1 = A(0)(0-1) + B(0-1) + C(0)^2$ ✓ $B = -1$ ✓ Vervang/*Substitute* $x = 1$: $3(1)^2 - 2(1) + 1 = A(1)(1-1) + B(1-1) + C(1)^2$ ✓ $C = 2$ ✓ $3x^2 - 2x + 1 = Ax^2 - Ax + Bx - B + Cx^2$ $= x^2(A + C)$ ✓ $+ x(-A + B)$ ✓ $- B$ $\therefore A + C = 3$ $\therefore A = 1$ ✓ $\therefore \frac{3x^2-2x+1}{x^2(x-1)} = \frac{1}{x} - \frac{1}{x^2} + \frac{2}{x-1}$ ✓	1: Faktore/*Factors* 1: Drie breuke met A,B en C/Three *fractions with A,B and C* 1: Maal KGV/*Multiply LCM* 1: Vervang/*Substitute* $x = 0$ 1: $B = -1$ 1: Vervang/*Substitute* $x = 1$ 1: $C = 2$ 1: $x^2(A + C)$ 1: $x(-A + B)$ 1: $A = 1$ 1: Vervang A,B en C/ *Substitute A,B and C* **[11]**

VRAAG/*QUESTION* 3 [13 PUNTE/*MARKS*]

3.1	$2m^2 - (-3)(6) = 0$✓ $m^2 = -9$✓ $m = \pm$✓ $3i$✓	1: Vergelyking/ *Equation* 1: $m^2 = -9$ 1: $\pm$ 1: $3i$ **[4]**
3.2a)	$\begin{bmatrix} 1 & 2 & 3 \\ 0 & 4 & 5 \\ 1 & 0 & 6 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 11 \\ 33 \\ -22 \end{bmatrix}$✓	**[1]**
b)	$\lvert A_y \rvert = \begin{vmatrix} 1 & 11 & 3 \\ 0 & 33 & 5 \\ 1 & -22 & 6 \end{vmatrix}$✓ $= 1\begin{vmatrix} 33 & 5 \\ -22 & 6 \end{vmatrix} - 11\begin{vmatrix} 0 & 5 \\ 1 & 6 \end{vmatrix} + 3\begin{vmatrix} 0 & 33 \\ 1 & -22 \end{vmatrix}$✓ $= 308$✓ $+ 55$✓ $- 99$✓ $= 264$✓ $y = \frac{\lvert A_y \rvert}{\lvert A \rvert}$✓ $= \frac{264}{22} = 12$✓	1: $\lvert A_y \rvert = \begin{vmatrix} 1 & 11 & 3 \\ 0 & 33 & 5 \\ 1 & -22 & 6 \end{vmatrix}$ 1: Reg vervang/ *Substitute* 3: Vereenvoudig/ *Simplify* 1: 264 1: $\frac{\lvert A_y \rvert}{\lvert A \rvert}$ 1: 12 **[8]**

VRAAG/*QUESTION* 4 [31 PUNTE/*MARKS*]

4.1a)	$y = \frac{3x^2}{2} - x^{\frac{7}{5}}$ ✓ $\frac{dy}{dx} = 3x$ ✓ $-\frac{7}{5}x^{\frac{2}{5}}$ ✓	1: $-x^{\frac{7}{5}}$ 1: $3x$ 1: $-\frac{7}{5}x^{\frac{2}{5}}$ **[3]**
b)	$y = x - 2$ ✓ $\frac{dy}{dx} = 1$ ✓	1: $x - 2$ 1: 1 **[2]**
c)	$y = (4x^5 - 3x)^{-10}$ ✓ $\frac{dy}{dx} = -10$ ✓$(4x^5 - 3x)^{-11}$ ✓$(20x^4$ ✓ $- 3$ ✓$)$	1: -10 1: -10 1: -11 1: $20x^4$ 1: -3 **[5]**
4.2	$\int (6x-2)^{\frac{1}{3}}$ ✓ dx $= \frac{(6x-2)^{\frac{4}{3}}}{\frac{4}{3}(6)}$ ✓ $+ k$ $= \frac{(6x-2)^{\frac{4}{3}}}{8} + k$ ✓	1: $(6x-2)^{\frac{1}{3}}$ 1: Eksponent en deel deur $\frac{4}{3}$/ *Exponent and devide by* $\frac{4}{3}$ 1: Noemer/ *Denominator* 8 en/*and* $+k$ **[3]**
4.3	$f(x) = \int \frac{3}{2}(x)^{-\frac{1}{2}}$ ✓ dx $= \frac{\frac{3}{2}(x)^{\frac{1}{2}}}{\frac{1}{2}}$ ✓ $+ k$ $f(x) = 3x^{\frac{1}{2}} + k$ ✓ Vervang/*Substitute* $(36: 2)$: $2 = 3(36)^{\frac{1}{2}} + k$ ✓ $k = \frac{1}{9}$ ✓ $f(x) = 3x^{\frac{1}{2}} + \frac{1}{9}$ ✓	1: $-\frac{1}{2}$ 1: Eksponent en deel deur $\frac{1}{2}$/ *Exponent and devide by* $\frac{1}{2}$ 1: $3x^{\frac{1}{2}} + k$ 1: Vervang/ *Substitute* $(36: 2)$ 1: $k = \frac{1}{9}$ 1: Vervang/ *Substitute* k **[6]**

4.4	Area $= \int_{-1}^{3}[(-2x+7)-(x^2-4x+4)]dx$ ✓ $= \int_{-1}^{3}[-2x+7-x^2+4x-4$ ✓$]dx$ $= \int_{-1}^{3}[-x^2+2x+3]dx$ ✓ $= \left[-\frac{x^3}{3}+\frac{2x^2}{2}+3x\right]\Big\|_{-1}^{3}$ ✓ $= \left[-\frac{3^3}{3}+3^2+3(3)\right]-\left[-\frac{(-1)^3}{3}+(-1)^2+3(-1)\right]$ ✓ $= 9+1\frac{2}{3}$ ✓ $= 10\frac{2}{3}$ ✓ vk eenhede	1: Integraal/*Integral* 1: Vereenvoudig/ *Simplify* $-(x^2-4x+4)$ 1: Vereenvoudig/ *Simplify* 1: Integreer/*Integrate* 1: Vervang/*Substitute* 3 en/*and -1* 1: $9+1\frac{2}{3}$ 1: $10\frac{2}{3}$ **[7]**
4.5	Volume $= \pi\int_0^3\left(\sqrt{4x^2+1}\right)^2 dx$ ✓ $= \pi\int_0^3(4x^2+1)\,dx$ ✓ $= \pi\left[\frac{4x^3}{3}+x\right]\Big\|_0^3$ ✓ $= \pi\left[\left(\frac{4(3)^3}{3}+3\right)-\left(\frac{4(0)^3}{3}+0\right)\right]$ ✓ $= 39\pi$ kubieke eenhede/*cubic units* ✓	1: Formule reg/ *Correct formula* 1: Kwadreer/*Square* 1: Integreer/*Integrate* 1: Vervang/*Substitute* 1: Antwoord/*Answer* **[5]**

VRAAG/*QUESTION* 5 [20 PUNTE/*MARKS*]

5.1	**A**	**B**	**C**	**D**
5.2	**A**	**B**	**C**	**D**
5.3	**A**	**B**	**C**	**D**
5.4	**A**	**B**	**C**	**D**
5.5	**A**	**B**	**C**	**D**
5.6	**A**	**B**	**C**	**D**
5.7	**A**	**B**	**C**	**D**
5.8	**A**	**B**	**C**	**D**
5.9	**A**	**B**	**C**	**D**
5.10	**A**	**B**	**C**	**D**