α-WISKUNDE/ MATHEMATICS

Maart/ March 2022 **Tyd/ Time: 1 uur/ *hour***
Graad/ Grade 12 **Totaal/ Total: 70 PUNTE/ *MARKS***

VRAAG/ *QUESTION* 1 [14 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**

VRAAG/ *QUESTION* 2 [9 PUNTE/ *MARKS*]

2.1	$P(0)$✓ $= 3^{0+1}.e^{0}$✓ $= 3$ ✓ $\therefore$ 3000 pikkewyne/ penguins	1: Vervang/ *Substitute* 1: Vereenvoudig/ *Simplify* 1:Antwoord/ *Answer* **[3]**
2.2	✓ ✓ ✓ ✓ ✓ ✓ $P'(0) = 3^{2t+1}.\ln 3.2.e^{-0,5t} + 3^{2t+1}.e^{-0,5t}(-0,5)$	1: 3^{2t+1} 1: $\ln 3.$ 1: 2 1: Produkreël/ *Product rule* 1: $e^{-0,5t}$ 1: $-0,5$ **[6]**

VRAAG/ *QUESTION* 3 [8 PUNTE/ *MARKS*]

3.1	$\ln(2x-1) = -2\left(\frac{7}{4}\right) = -\frac{7}{2}$ ✓ $\therefore e^{-\frac{7}{2}} = 2x-1$ ✓ $\therefore x = \frac{e^{-\frac{7}{2}+1}}{2}$ ✓ 0,52 ✓	1: Vereenvoudig/ *Simplify* 1: Eksponensiële vorm/ Exponential form 1: Vereenvoudig/ *Simplify* Antwoord/ *Answer* **[4]**
3.2	$x = e^{\text{bgtan}(y-1)}$ ✓ $\therefore \text{bgtan}(y-1) = \ln x$ ✓ $\therefore \tan(\ln x) = y-1$ ✓ $\therefore \tan(\ln x)+1 = y$ ✓	1: Ruile x en y/ *Swop x and y* 1: ln 1: tan 1: Antwoord/ *Answer* **[4]**

VRAAG/ *QUESTION* 4 [13 PUNTE/ *MARKS*]

4.1	$\frac{dy}{dx} = \frac{e.e^{3x}.3}{\sqrt{1-e^{6x}}} + p^2$ ✓ ✓ ✓ ✓ ✓	1:e 1:e^{3x} 1:3 1:p^2 1: $\sqrt{1-e^{6x}}$ **[5]**
4.2	$f'(x) = \frac{\frac{1}{\sin^2 x}.2\sin x.\cos x.\log_3(5x) - \ln(\sin^2 x).\frac{5}{5x.\ln 3}}{[\log_3(5x)]^2}$ ✓ ✓ ✓ ✓ ✓ ✓ ✓	1: $\frac{1}{\sin^2 x}$ 1:$2\sin x$ 1:$\cos x$ 1:kwosiëntreël 1:5 1:$5x$ 1:$\ln 3$ 1: $[\log_3(5x)]^2$ **[8]**

VRAAG/ *QUESTION* 5 [8 PUNTE/ *MARKS*]

5.1	✓ ✓ $\frac{4^{7x}}{\ln 4.7}+\frac{e^{8x}}{8}+k$ ✓ ✓ ✓	1: 4^{7x} 1: $\ln 4$ 1: 7 1: e^{8x} 1: 8 **[5]**
5.2	✓ ✓ ✓ $ex+2\ln(3-x)+k$	1: ex 1: $+2$ 1:$\ln(3-x)$ **[3]**

VRAAG/ *QUESTION* 6 [10 PUNTE/ *MARKS*]

6.1	✓ ✓ $p=2\left(\cos\left(-\frac{\pi}{3}\right)+i\sin\left(-\frac{\pi}{3}\right)\right)$ OF/ OR $p=2\left(\cos\left(\frac{5\pi}{3}\right)+i\sin\left(\frac{5\pi}{3}\right)\right)$ ✓ ✓ $t=4\left(\cos\left(\frac{5\pi}{4}\right)+i\sin\left(\frac{5\pi}{4}\right)\right)$	1:2 1: $-\frac{\pi}{3}$ / $\frac{5\pi}{3}$ 1: 4 1: $\frac{5\pi}{4}$
6.2	✓ ✓ $\frac{1}{2}\left(\cos\left(\frac{-19\pi}{12}\right)+i\sin\left(\frac{-19\pi}{12}\right)\right)$ OF/ OR $\frac{1}{2}\left(\cos\left(\frac{5\pi}{12}\right)+i\sin\left(\frac{5\pi}{12}\right)\right)$	1: $\frac{1}{2}$ 1: $\frac{-19\pi}{12}$ / $\frac{5\pi}{12}$
6.3	✓ ✓ $\frac{1}{64}\left(\cos\left(\frac{-19\pi}{2}\right)+i\sin\left(\frac{-19\pi}{2}\right)\right)$ OF/ OR $\frac{1}{64}\left(\cos\left(\frac{5\pi}{2}\right)+i\sin\left(\frac{5\pi}{2}\right)\right)$ $=\frac{1}{64}(0+i)$ ✓ $=\frac{i}{64}$ ✓	1: $\frac{1}{64}$ 1: $\frac{-19\pi}{2}$ / $\frac{5\pi}{2}$ 1: Vereenvoudig/ *Simplify* 1: Antwoord/ *Answer*

VRAAG/ *QUESTION* 7 [8 PUNTE/ *MARKS*]

7	✓ ✓ ✓ ✓ ✓ ✓ $\frac{1}{2}(\ln y)^{-\frac{1}{2}}.\frac{1}{y}.\frac{dy}{dx}-y^{-2}\frac{dy}{dx}=1$ $\frac{dy}{dx}=\frac{1}{\frac{1}{2}(\ln y)^{-\frac{1}{2}}.\frac{1}{y}-y^{-2}}$	1: $\frac{1}{2}(\ln y)^{-\frac{1}{2}}$ 1: $\frac{1}{y}$ 1: $\frac{dy}{dx}$ 1: y^{-2} 1: $\frac{dy}{dx}$ 1: 1 2: Antwoord/ *Answer*