

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 10

NOVEMBER 2020

**MATHEMATICS P1/WISKUNDE V1
MARKING GUIDELINE/NASIENRIGLYN
(EXEMPLAR/EKSEMPLAAR)**

MARKS/PUNTE: 100

This marking guideline consists of 10 pages. /
Hierdie nasienriglyn bestaan uit 10 bladsye.

NOTE:

- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

LET WEL:

- *As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.*
- *Dit is onaanvaarbaar om waardes/antwoorde te veronderstel om 'n probleem op te los.*

QUESTION/VRAAG 1			
1.1.1	$4y^2 - 16$ $= 4(y^2 - 4)$ $= 4(y - 2)(y + 2)$ <p style="text-align: center;">OR/OF</p> $4y^2 - 16$ $= (2y - 4)(2y + 4)$ $= 2(y - 2)2(y + 2)$ $= 4(y - 2)(y + 2)$	✓ answer/antwoord ✓ answer/antwoord	(1) (1)
1.1.2	$\frac{x^3 - 1}{x^2 + x + 1}$ $= \frac{(x - 1)(x^2 + x + 1)}{x^2 + x + 1}$ $= x - 1$	✓ factorising/ <i>faktorisier</i> ✓ answer/antwoord	(2)
1.1.3	$x - 1 + y - xy$ $= (x - 1) + y(1 - x)$ $= (x - 1) - y(x - 1)$ $= (x - 1)(1 - y)$	✓ common factor/ gemene faktor ✓ answer/antwoord	(2)
1.2.1	$\frac{3 - 3x}{x^2 - 3x + 2}$ $= \frac{3(1 - x)}{(x - 1)(x - 2)}$ $= \frac{-3(x - 1)}{(x - 1)(x - 2)}$ $= \frac{-3}{x - 2}$	✓ factorising numerator/ <i>faktorisering</i> <i>teller</i> ✓ factorising denominator/ <i>faktorisering</i> <i>noemer</i> ✓ answer/antwoord	(3)

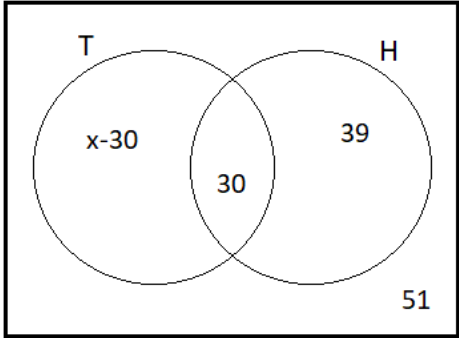
1.2.2	$\frac{16^{-x} \cdot 12^{x+1}}{3^x \cdot 4^{-x}}$ $= \frac{4^{-2x} \cdot 4^{x+1} \cdot 3^{x+1}}{3^x \cdot 4^{-x}}$ $= 4^{-2x+x+1+x} \times 3^{x+1-x}$ $= 4^1 \times 3^1$ $= 12$	<ul style="list-style-type: none"> ✓ separating bases/ <i>opbreek van 12 and/en 16</i> ✓ addition of exponents/<i>optelling van eksponente</i> ✓ answer/<i>antwoord</i> 	(3)
1.3	$m = x(x - y)^2$ $= x(x^2 - 2xy + y^2)$ $= x^3 - 2x^2y + xy^2$ $= 3 + 4$ $= 7$	<ul style="list-style-type: none"> ✓ expansion/<i>uitbreiding</i> ✓ substitution/<i>vervanging</i> ✓ answer/<i>antwoord</i> 	(3)
			[14]

QUESTION/VRAAG 2			
2.1.1	$x^3 = 9x$ $x^3 - 9x = 0$ $x(x^2 - 9) = 0$ $x(x - 3)(x + 3) = 0$ $x = 0 \text{ or/of } x = 3 \text{ or/of } x = -3$	✓ factorisation/ <i>faktorisering</i> ✓ factors/ <i>faktore</i> ✓ answer/ <i>antwoord</i>	(3)
2.1.2	$P = \frac{3}{2}x(PQ^2 - Pq^2)$ $\Rightarrow \frac{3}{2}x(PQ^2 - Pq^2) = P$ $\frac{3}{2}x = \frac{P}{PQ^2 - Pq^2}$ $= \frac{P}{P(Q^2 - q^2)}$ $\therefore x = \frac{P}{P(Q^2 - q^2)} \times \frac{2}{3}$ $= \frac{2}{3(Q^2 - q^2)}$	✓ $\div PQ^2 - Pq^2$ ✓ common factor/ P <i>gemene factor</i> P ✓ $\times \frac{2}{3}$ ✓ answer/ <i>antwoord</i>	(4)
2.1.3	$3x^{\frac{3}{4}} = 81$ $x^{\frac{3}{4}} = 27$ $x^{\frac{3}{4}} = 3^3$ $\left(x^{\frac{3}{4}}\right)^{\frac{4}{3}} = \left(3^3\right)^{\frac{4}{3}}$ $x = 3^4$ $x = 81$	✓ divide both sides by 3 and both sides $(\)^{\frac{4}{3}}$ / <i>deel beide kante</i> <i>deur 3 en beide</i> <i>kante $(\)^{\frac{4}{3}}$</i> ✓ answer/ <i>antwoord</i>	(2)
2.2.1	$3(2 - 3x) \geq 15$ $6 - 9x \geq 15$ $-9x \geq 9$ $x \leq -1$ <p style="text-align: center;">OR/OF</p> $2 - 3x \geq 5$ $-3x \geq 3$ $x \leq -1$	✓ simplify/ <i>vereenvoudig</i> ✓ (\leq) ✓ answer/ <i>antwoord</i>	(3)
2.2.2		✓ answer/ <i>antwoord</i>	(1)

2.3	$3x + 2y = 13 \quad \underline{\hspace{2cm}} \text{ (1)}$ $3x = 2 - y \quad \underline{\hspace{2cm}} \text{ (2)}$ $y = 2 - 3x \quad \underline{\hspace{2cm}} \text{ (3)}$ <p>Subs. (3) into (1)</p> $3x + 2(2 - 3x) = 13$ $3x + 4 - 6x = 13$ $3x - 6x = 13 - 4$ $-3x = 9$ $x = -3$ <p>$y = 2 - 3(-3)$</p> $= 2 + 9$ $y = 11$ <p style="text-align: center;">OR/OF</p> $3x + 2y = 13 \quad \underline{\hspace{2cm}} \text{ (1)}$ $3x + y = 2 \quad \underline{\hspace{2cm}} \text{ (2)}$ <p>(1) - (2): $y = 11$</p> <p>Subs./Verv. $y = 11$ into (2)</p> $3x + 11 = 2$ $3x = -9$ $\therefore x = -3$ <p style="text-align: center;">OR/OF</p> $3x + 2y = 13 \quad \underline{\hspace{2cm}} \text{ (1)}$ $3x + y = 2 \quad \underline{\hspace{2cm}} \text{ (2)}$ <p>(2) x 2: $6x + 2y = 4 \quad \underline{\hspace{2cm}} \text{ (3)}$</p> <p>(1)-(3): $3x + 2y = 13$</p> $\underline{6x + 2y = 4}$ $-3x = 9$ $\therefore x = -3$ <p>Subst. $x = -3$ into (1)/Vervang $x = -3$ in (1)</p> $3(-3) + 2y = 13$ $-9 + 2y = 13$ $2y = 22$ $y = 11$	<p>✓ substitution/ vervanging 3de vergelyking</p> <p>✓ simplification/ vereenvoudig</p> <p>✓ x-value/x-waarde</p> <p>✓ y-value/y-waarde</p> <p>(4)</p> <p>✓ subtract (2) from (1)/ Trek (2) af vanaf (1)</p> <p>✓ y-value/y-waarde</p> <p>✓ substitution/ vervanging</p> <p>✓ x-value/x-waarde</p> <p>(4)</p> <p>✓ multiply (2) x 2/ Maal (2) met 2</p> <p>✓ subtract (3) from (1)/ Trek (3) af vanaf (1)</p> <p>✓ x-value/x-waarde</p> <p>✓ y-value/y-waarde</p> <p>(4)</p>	(4)
			[17]

QUESTION/VRAAG 5			
5.1.1	$g(x) = \frac{a}{x} + q$ $2 = \frac{a}{4} + 1$ $\Rightarrow \frac{a}{4} + 1 = 2$ $\frac{a}{4} = 1$ $a = 4$ $g(x) = \frac{4}{x} + 1$	<ul style="list-style-type: none"> ✓ $q = 1$ ✓ substitution/ vervanging ✓ answer/antwoord 	(3)
5.1.2	$h(x) = x + 1$	<ul style="list-style-type: none"> ✓ positive gradient/ positiewe gradiënt ✓ answer/antwoord 	(2)
5.2		<ul style="list-style-type: none"> ✓ asymptotes/ asimptote ✓ positive gradient of h/ positiewe gradiënt van h ✓ x-intercept of h/ x-afsnitte van h ✓ points of intersection of g and h/ snyppunte van g en h 	(4)
5.3	$f(x) = -\left(\frac{4}{x} + 1\right) + 3$ $= -\frac{4}{x} - 1 + 3$ $f(x) = -\frac{4}{x} + 2$ $x = 0$ $y = 2$	<ul style="list-style-type: none"> ✓ equation of f / vergelyking van f ✓ $x = 0$ ✓ $y = 2$ 	(3)
5.4.1	$x = 2$ and/en -2	<ul style="list-style-type: none"> ✓ $x = -2$ ✓ $x = 2$ 	(2)
5.4.2	$x \in [-2; 0)$ OR/OF $-2 \leq x < 0$	<ul style="list-style-type: none"> ✓✓ $[-2; 0)$ ✓✓ $-2 \leq x < 0$ 	(2) (2)
			[16]

QUESTION/VRAAG 6			
6.1		<ul style="list-style-type: none"> ✓ asymptote/ asimptote ✓✓ points of intersection/ snypunte ✓ shape of g/vorm van g ✓ shape of h/vorm van h ✓ f through origin / deur oorsprong 	(6)
6.2	<p>(0,5; 0,75)</p> <p style="text-align: center;">OR/OF</p> <p>$(\frac{1}{2}; \frac{3}{4})$</p>	<ul style="list-style-type: none"> ✓ 0,5 / $\frac{1}{2}$ ✓ 0,75 / $\frac{3}{4}$ <p>accept/aanvaar $x \in (0,25; 0,5)$ / $(\frac{1}{4}; \frac{1}{2})$ $y \in (0,5; 0,8)$ / $(\frac{1}{2}; \frac{4}{5})$</p>	(2)
6.3	<p>$y > -1$</p> <p style="text-align: center;">OR/OF</p> <p>$y \in (-1; \infty)$</p> <p style="text-align: center;">OR/OF</p> <p>$y \neq -1, y \in \mathbb{R}$</p>	<ul style="list-style-type: none"> ✓ answer/antwoord ✓ answer/antwoord ✓ answer/antwoord 	(1) (1) (1)
6.4	<p>$x \in (-\infty; \infty)$</p> <p style="text-align: center;">OR/OF</p> <p>$x \in \mathbb{R}$</p>	<ul style="list-style-type: none"> ✓✓ answer/ antwoord ✓✓ answer/ antwoord 	(2) (2)
6.5	<p>$x = -1$</p> <p>$y = 0$</p>	<ul style="list-style-type: none"> ✓✓ answer/ antwoord 	(2)
6.6	<p>$x \in (-\infty; -2)$</p> <p style="text-align: center;">OR/OF</p> <p>$x < -2$</p>	<ul style="list-style-type: none"> ✓✓ answer/ antwoord ✓✓ answer/ antwoord 	(2) (2)
			[15]

QUESTION/VRAAG 7			
7.1.1	$P(S) + P(T) = 1$	✓ answer/antwoord	(1)
7.1.2	$P(T) = P(S') = 0,33$	✓ answer/antwoord	(1)
7.2.1		✓ 30 (intersection/ <i>deursnee</i>) ✓ 39 (H only/ <i>alleenlik</i>) ✓ $x - 30$ (T only/ <i>alleenlik</i>) ✓ 51 (outside/ <i>buitekant</i>)	(4)
7.2.2	$x - 30 + 30 + 39 + 51 = 180$ $x + 90 = 180$ $\therefore x = 90$ TB only: $90 - 30$ TB <i>alleenlik</i> $= 60$	✓ equation/ <i>vergelyking</i> ✓ value of/waarde van x ✓ answer/antwoord	(3)
7.2.3	(a) $P(T \text{ only}) = \frac{60}{180}$ $P(T \text{ alleenlik})$ $= \frac{1}{3} \text{ or/of } 0,33$ (b) $P(\text{no disease/} \textit{geen siekte}) = \frac{51}{180}$	✓ substitution of 60/ <i>vervanging</i> <i>met 60</i> ✓ answer/antwoord ✓ answer/antwoord	(2) (1)
			[12]
TOTAL/TOTAAL:			100