Province of the
EASTERN CAPE
EDUCATION

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:

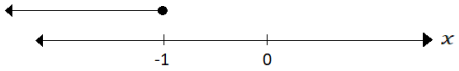
- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

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	$4y^2 - 16$ $= 4(y^2 - 4)$ $= 4(y - 2)(y + 2)$ **OR/*OF*** $4y^2 - 16$ $=(2y - 4)(2y + 4)$ $=2(y - 2))2(y + 2)$ $=4(y - 2)(y + 2)$	✓ 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/ *faktoriseer* ✓ 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/ *faktorisering teller* ✓ factorising denominator/ *faktorisering noemer* ✓ answer/*antwoord*	(3)

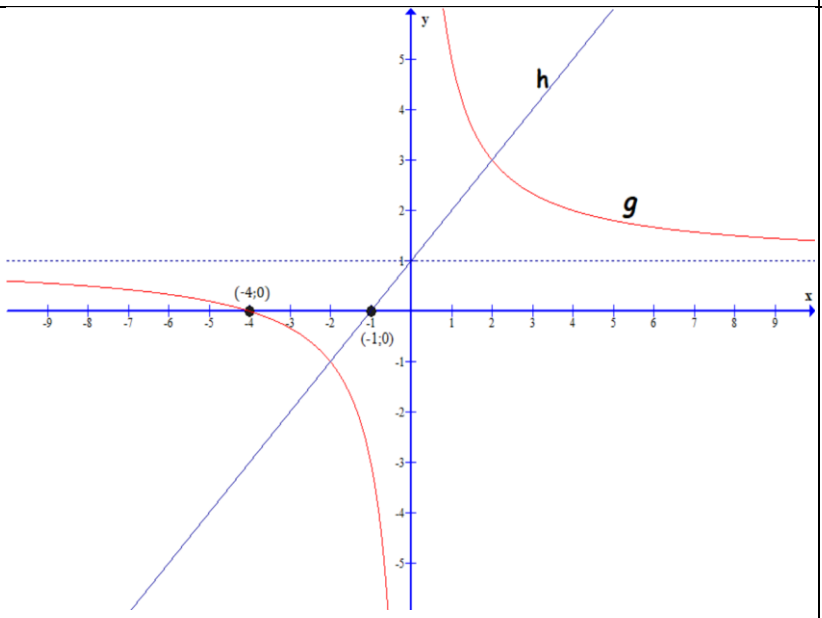
1.2.2	$\frac{16^{-x}.12^{x+1}}{3^x.4^{-x}}$ $= \frac{4^{-2x}.4^{x+1}.3^{x+1}}{3^x.4^{-x}}$ $= 4^{-2x+x+1+x} \times 3^{x+1-x}$ $= 4^1 \times 3^1$ $= 12$	✓ separating bases/ *opbreek van 12 and/en 16* ✓ addition of exponents/*optelling van eksponente* ✓ answer/*antwoord*	(3)
1.3	$m = x(x-y)^2$ $= x(x^2 - 2xy + y^2)$ $= x^3 - 2x^2y + xy^2$ $= 3 + 4$ $= 7$	✓ expansion/*uitbreiding* ✓ substitution/*vervanging* ✓ answer/*antwoord*	(3)
			[14]

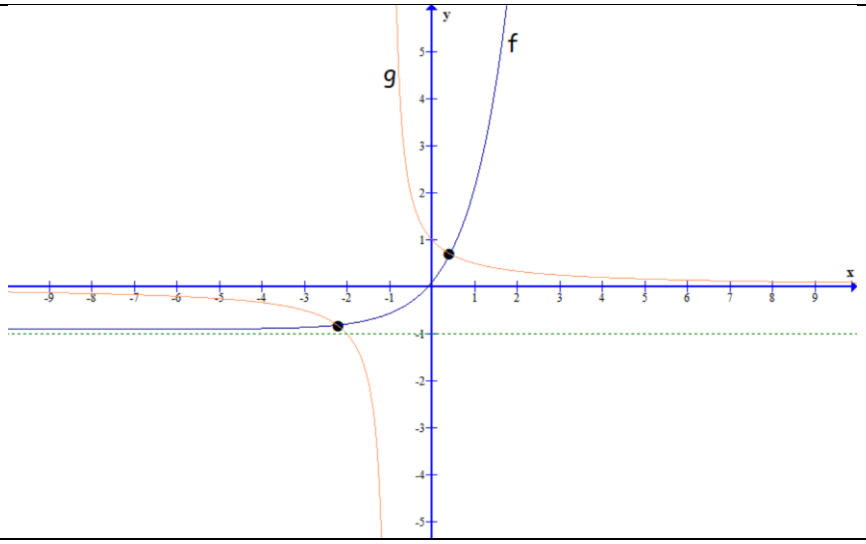
QUESTION/*VRAAG* 2			
2.1.1	$x^3 = 9x$ $x^3 - 9x = 0$ $x(x^2 - 9) = 0$ $x(x-3)(x+3) = 0$ $x = 0$ or/of $x = 3$ or/of $x = -3$	✓ factorisation/ *faktorisering* ✓ factors/*faktore* ✓ answer/*antwoord*	(3)
2.1.2	$P = \frac{3}{2}x(PQ^2 - Pq^2)$ $\Rightarrow \frac{3}{2}x(PQ^2 - Pq^2) = P$ $\frac{3}{2}x =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

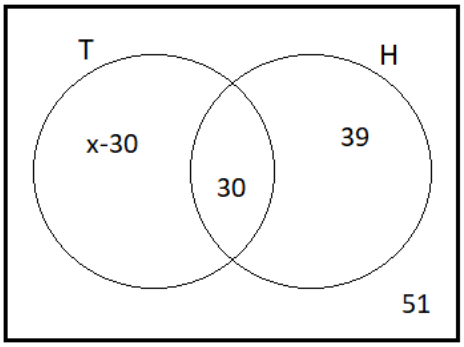
2.3	$3x + 2y = 13$ _____(1) $3x = 2 - y$ _____(2) $y = 2 - 3x$ _____(3) Subs. (3) into (1) $3x + 2(2 - 3x) = 13$ $3x + 4 - 6x = 13$ $3x - 6x = 13 - 4$ $-3x = 9$ $x = -3$ $y = 2 - 3(-3)$ $= 2 + 9$ $y = 11$ **OR/*OF*** $3x + 2y = 13$ _____(1) $3x + y = 2$ _____(2) (1) – (2): y =11 Subs./*Verv.* $y = 11$ into (2) $3x + 11 = 2$ $3x = -9$ $\therefore\ x = -3$ **OR/*OF*** $3x + 2y = 13$ _____(1) $3x + y = 2$ _____(2) (2) x 2: $6x + 2y = 4$ _____(3) (1)-(3): $3x + 2y = 13$ $\underline{6x + 2y = 4}$ $-3x = 9$ $\therefore\ x = -3$ Subst. $x = -3$ into (1)/*Vervang* $x = -3$ in (1) $3(-3) + 2y = 13$ $-9 + 2y = 13$ $2y = 22$ $y = 11$	✓ substitution/ *vervanging* 3de *vergelyking* ✓ simplification/ *vereenvoudig* ✓ x-value/x-waarde ✓ y-value/y-*waarde* ✓ subtract (2) from (1)/ *Trek (2) af vanaf (1)* ✓ y-value/y-*waarde* ✓ substitution/ *vervanging* ✓ x-value/x-*waarde* ✓ multiply (2) x 2/ *Maal (2) met 2* ✓ subtract (3) from (1)/ Trek (3) *af vanaf* (1) ✓ x-value/x-*waarde* ✓ y-value/y-*waarde*	(4) (4) (4)
			[17]

QUESTION/*VRAAG* 3			
3.1	$2(0)+2\,;3(0)+4\,;5(0)+6\,;\ldots$ $2\,;4\,;6\,;8$ $T_n = mn + c$ $8 = 2(4) + c$ $\Rightarrow 8 + c = 8$ $\therefore \quad c = 0$ $\therefore \quad T_n = 2n$ **OR/*OF*** 2 ; 4 ; 6 ; 8 d = 2 $T_1 = 2(1) = 2$ $T_2 = 2(2) = 4$ $T_3 = 2(3) = 6$ $T_4 = 2(4) = 8$ $\therefore T_n = 2n$	✓ fourth/*vierde* term ✓ substitution/*vervanging* ✓ value of/*waarde van* c ✓ answer/*antwoord* ✓ fourth/*vierde* term ✓ value of/*waarde van* d ✓ substitution/*vervanging* ✓ answer/*antwoord*	(4) (4)
3.2	$T_{18} = 2(18)$ $= 36$	✓ substitution/ *vervanging* ✓ answer/*antwoord*	(2)
3.3	$T_n = 2n$ $108 = 2n$ $\Rightarrow 2n = 108$ $\therefore \quad n = 54$	✓ $T_n = 108$ ✓ answer/*antwoord*	(2)
3.4	$2n < 166$ $n < 83$ T_{82} is the first term less than 166/ T_{82} *is die eerste term* < 166	✓ $2n < 166$ ✓ $n < 83$ ✓ conclusion/*afleiding*	(3)
3.5	5; 10; 15; 20; 25; 30; …. 32 × 5 = 160 **OR/*OF*** 10; 20; 30; ;…… The 16th even number / *16de ewe getal* = 16 × 10 = 160	✓ 16th even = 32nd number in the pattern 16de *ewe* = 32ste *getal in die patroon.* ✓ 32 x 5 ✓ answer/*antwoord* ✓ Even numbers/*Ewe getalle* ✓ 16 x 10 ✓ answer/*antwoord*	(3) (3)
			[14]

QUESTION/*VRAAG* 4			
4.1.1	$\frac{Deposit}{deposito} = \frac{30}{100} \times 9\,899$ $= R2\,969{,}70$ $\frac{Balance}{balans}: R9\,899 - R2\,969{,}70 = R6\,929{,}30$ **OR/*OF*** $\frac{70}{100} \times 9\,899$ $= R6\,929{,}30$	✓ deposit/*deposito* ✓ balance/*balans* ✓ $\frac{70}{100} \times 9\,899$ ✓ answer/*antwoord*	(2) (2)
4.1.2	$A = P(1 + in)$ $= 6\,929{,}30\,(1 + \frac{12}{100} \times 3)$ $A = R9\,423{,}85$ $Monthly\ payment = \frac{R9\,423{,}85}{36} + R65{,}30$ $Maandelikse\ paaiement = R327{,}07$	✓ substitution/ *vervanging* ✓ total payment/ *totale paaiement* ✓ $\div 36$ ✓ + R65,30 ✓ answer/*antwoord*	(5)
4.2.1	Cost of machine/*Koste van masjien* $\frac{6\,800}{27{,}63} \times 16{,}24 = £3\,996{,}82$ George will save money if he buys the machine in the USA / Machine is cheaper in the USA. / Machine is more expensive in England./ *George sal geld bespaar as hy die masjien in Amerika koop. / Masjien is goedkoper in Amerika / Masjien is duurder in Engeland.*	✓ $\frac{6800}{27{,}63} \times 16{,}24$ ✓ £3996,82 ✓ conclusion/ *gevolgtrekking*	(3)
4.2.2	$£800 \times 27{,}63$ $= R22\,104{,}00$	✓ correct conversion / *korrekte herleiding* ✓ answer/*antwoord*	(2)
			[12]

QUESTION/*VRAAG* 5			
5.1.1	$g(x) = \frac{a}{x} + q$ $2 = \frac{a}{4} + 1$ $\Rightarrow \frac{a}{4} + 1 = 2$ $\frac{a}{4} = 1$ $a = 4$ $g(x) = \frac{4}{x} + 1$	✓ $q = 1$ ✓ substitution/ *vervanging* ✓ answer/*antwoord*	(3)
5.1.2	$h(x) = x + 1$	✓ positive gradient/ *positiewe gradiënt* ✓ answer/*antwoord*	(2)
5.2		✓ 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*/*snypunte van g en h*	(4)
5.3	$f(x) = -\left(\frac{4}{x} + 1\right) + 3$ $= -\frac{4}{x} - 1 + 3$ $f(x) = -\frac{4}{x} + 2$ $x = 0$ $y = 2$	✓ equation of f / *vergelyking van f* ✓ $x = 0$ ✓ $y = 2$	(3)
5.4.1	$x = 2\ and/en - 2$	✓ $x = -2$ ✓ $x = 2$	(2)
5.4.2	$x \in [-2; 0)$ **OR/*OF*** $-2 \leq x < 0$	✓✓ $[-2; 0)$ ✓✓ $-2 \leq x < 0$	(2) (2)
			[16]

QUESTION/*VRAAG* 6			
6.1		✓ 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	(0,5; 0,75) **OR/*OF*** $(\frac{1}{2}\ ;\ \frac{3}{4})$	✓ 0,5 / $\frac{1}{2}$ ✓ 0,75 /$\frac{3}{4}$ accept/*aanvaar* $x \in (0{,}25; 0{,}5)$ / $(\frac{1}{4}\ ;\ \frac{1}{2})$ $y \in (0{,}5; 0{,}8)$ / $(\frac{1}{2}\ ;\ \frac{4}{5})$	(2)
6.3	$y > -1$ **OR/*OF*** $y \in (-1\ ;\ \infty)$ **OR/*OF*** $y \neq -1, y \in \mathbb{R}$	✓ answer/*antwoord* ✓ answer/*antwoord* ✓ answer/*antwoord*	(1) (1) (1)
6.4	$x \in (-\infty; \infty)$ **OR/*OF*** $x \in \mathbb{R}$	✓✓ answer/ *antwoord* ✓✓ answer/ *antwoord*	(2) (2)
6.5	$x = -1$ $y = 0$	✓✓ answer/ *antwoord*	(2)
6.6	$x \in (-\infty; -2)$ **OR/*OF*** $x < -2$	✓✓ 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/ *deursnee*) ✓ 39 (H only/ *alleenlik*) ✓ $x - 30$ (T only/*alleenlik*) ✓ 51 (outside/ *buitekant*)	(4)
7.2.2	$x - 30 + 30 + 39 + 51 = 180$ $x + 90 = 180$ $\therefore \quad x = 90$ TB only: $90 - 30$ TB alleenlik $= 60$	✓ equation/ *vergelyking* ✓ value of/*waarde van x* ✓ answer/*antwoord*	(3)
7.2.3	(a) $P(T\ only) = \frac{60}{180}$ P(T alleenlik) $= \frac{1}{3}\ or/of\ 0{,}33$ (b) $P(\text{no disease}/geen\ siekte) = \frac{51}{180}$	✓ substitution of 60/*vervanging met 60* ✓ answer/*antwoord* ✓ answer/*antwoord*	(2) (1)
			[12]
		TOTAL/TOTAAL:	**100**