GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

PROVINSIALE EKSAMEN

NOVEMBER 2022

GRADE 10/*GRAAD 10*

MARKING GUIDELINES/

NASIENRIGLYNE

MATHEMATICS (PAPER 1)/*WISKUNDE (VRAESTEL 1)*

9 pages/*bladsye*

NOTE/*LET WEL:*

- 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.

- *As 'n kandidaat 'n VRAAG TWEE KEER beantwoord het, merk slegs die EERSTE poging.*
- *As 'n kandidaat 'n antwoord deurgehaal het en dit nie oorgedoen het nie, merk die deurgehaalde antwoord.*
- *Konsekwente akkuraatheid is van toepassing op ALLE aspekte van die nasienriglyne.*
- *Om waardes/antwoorde te aanvaar om 'n probleem op te los is onaanvaarbaar.*

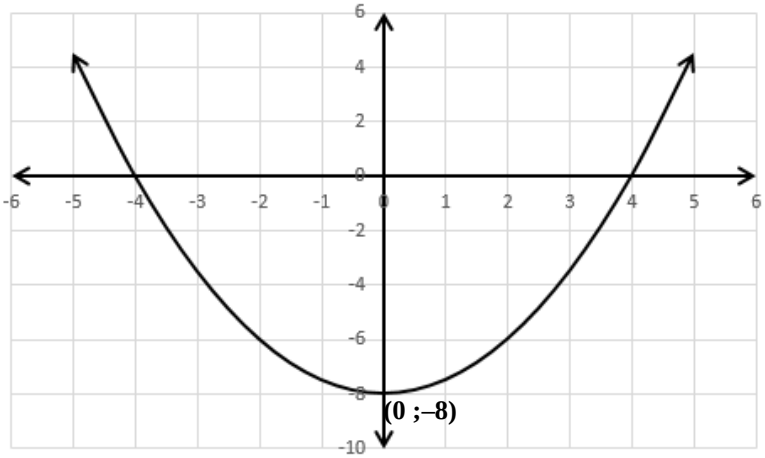
QUESTION/*VRAAG* 1				
1.1	1.1.1	$2x^6-8$ $=2(x^6-4)$ $=2\left(x^3+2\right)\left(x^3-2\right)$	✓ factorise/*faktoriseer* ✓ factorise/*faktoriseer*	(2)
	1.1.2	$-x+(x-y)^3+y$ $=(x-y)^3-(x-y)$ $=(x-y)[(x-y)^2-1]$ $=(x-y)(x-y+1)(x-y-1)$	✓ $-(x-y)$ ✓ common factor $(x-y)$ *gemeenskaplike faktor* $(x-y)$ ✓ $[(x-y)^2-1]$ ✓ diff. of two squares/ *verskil tussen twee vierkante*	(4)
1.2	1.2.1	$\left(x^{\frac{1}{2}}-3\right)^2$ $=x^{\frac{1}{4}}-6x^{\frac{1}{2}}+9$	✓ $x^{\frac{1}{4}}$ and/*en* 9 ✓ $-6x^{\frac{1}{2}}$	(2)
	1.2.2	$x^{-3}\div x^{-5}+(x^{-2})^{-1}$ $=x^{-3-(-5)}+x^2$ $=x^2+x^2$ $=2x^2$	✓ division x^{-3+5} and brackets/ *deel* x^{-3+5} *en hakies* ✓ simplify/*vereenvoudig*	(2)
	1.2.3	$\frac{5^{x+1}.(4^x)^3}{2^{5x-2}.10^{x-1}}$ $=\frac{5^{x+1}.(2^{2x})^3}{2^{5x-2}.(5.2)^{x-1}}$ $=\frac{5^{x+1}.2^{6x}}{2^{5x-2}.5^{x-1}.2^{x-1}}$ $=5^{x+1-x+1}.2^{6x-5x+2-x+1}$ $=5^2.2^3$ $=200$	✓ bases primefactors/ *basisse priemfaktore* ✓ simplify numerator/ *vereenvoudig teller* ✓ simplify denominator/ *vereenvoudig noemer* ✓ final answer/ *finale antwoord*	(4)

	1.2.4	$\frac{-11}{2x^2-5x-12}-\frac{1}{4-x}$ $=\frac{-11}{(2x+3)(x-4)}+\frac{1}{x-4}$ $=\frac{-11+2x+3}{(2x+3)(x-4)}$ $=\frac{2x-8}{(2x+3)(x-4)}$ $=\frac{2(x-4)}{(2x+3)(x-4)}$ $=\frac{2}{2x+3}$	✓ Factorise trinomial/ *Faktoriseer drieterm* ✓ Change of sign/ *Verandering van teken* ✓ Numerator/*Teller* ✓ LCD/KGV ✓ Simplified answer/ *Vereenvoudigde antwoord*	(5)
1.3		$(3x+2)(2x-5)$ $=6x^2-11x-10$ $\therefore d=-11$	✓ $(2x-5)$ ✓ Simplify/*Vereenvoudig* ✓ Answer/*Antwoord*	(3)
				[22]
QUESTION/*VRAAG* 2				
2.1	2.1.1	$(3x-1)(x+2)=0$ $x=\frac{1}{3}$ or/*of* $x=-2$	✓ $\frac{1}{3}$ ✓ -2	(2)
	2.1.2	$3^x-2.3^{x-1}=3$ $3^x(1-2.3^{-1})=3$ $3^x\left(\frac{1}{3}\right)=3$ $3^x=3^2$ $x=2$ If answer ONLY NO marks/ *SLEGS antwoord GEEN punte nie*	✓ Factorise/*Factorise* ✓ Simplify/*Vereenvoudig* ✓ Answer/*Antwoord*	(3)
2.2	2.2.1	$-1\leq 1-\frac{2x}{3}<5$ $-2\leq -\frac{2x}{3}<4$ $-6\leq -2x<12$ $3\geq x>-6$ $-6<x\leq 3$	✓ Subtract 1 on both sides/ *Trek 1 aan albei kante af* ✓ $\times 3$ ✓ $\div(-2)$ and change of inequalities/*en verandering van ongelykhede*	(3)
	2.2.2	9 integers satisfy the equation/*9 heelgetalle voldoen aan die vergelyking*	✓ Answer/*Antwoord*	(1)

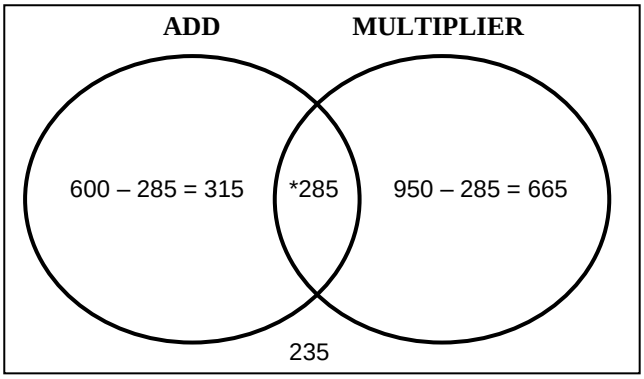
2.3	Solve for x and y simultaneously/*Los vir x en y gelyktydig op*: $x - y = 4$ and/*en* $\frac{x}{5} + \frac{y}{2} = 5$ $x = y + 4$……(1) $2x + 5y = 50$……..(2) subst/*vervang* (1) into/*in* (2) $2(y + 4) + 5y = 50$ $2y + 8 + 5y = 50$ $7y = 42$ $y = 6$ $x = 6$ $x = 10$ **OR/*OF*** $y = x - 4$……(1) subst/*vervang* (1) into/*in* (2) $2x + 5(x - 4) = 50$ $2x + 5x - 20 = 50$ $7x = 70$ $x = 10$ $y = 10 - 4$ $y = 6$	✓ Make x the subject of the equation (1)/*Maak x die onderwerp van die vergelyking (1)* ✓ LCD/*KGV* ✓ Substitute/*Vervang* ✓ y value/*y-waarde* ✓ x value/*x-waarde* ✓ Make y the subject of the equation (1)/*Maak y die onderwerp van die vergelyking (1)* ✓ Substitute/*Vervang* ✓ Simplify/*Vereenvoudig* ✓ x value/*x-waarde* ✓ y value/*y-waarde*	(5)
			[14]

QUESTION/*VRAAG* 3				
3.1	3.1.1	Zain's formula/*Zain se formule*: $T_n = 4(n-1)+2$ $= 4n-4+2$ $= 4n-2$ This is the same as Letti's formula. They are both correct./ *Dit is dieselfde as Lettie se formule. Hulle is albei korrek.*	✓ Method/*Metode* ✓ Answer/*Antwoord* ✓ Reason/*Rede*	(3)
	3.1.2	$T_{27} = 4(27) - 2$ ✓ $= 106$ ✓	✓ Substitution/ *Vervanging* ✓ Answer/*Antwoord*	(2)
3.2	3.2.1	$T_n = 5n - 8$ ✓✓	✓ 5n ✓ – 8	(2)
	3.2.2	The 52th number to end in a 7 will be T_{105}/*Die 52ste getal wat op 'n 7 einding sal* T_{105} *wees.* $T_{105} = 5(105) - 8$ $= 517$ **OR/*OF*** 7 ; 17 ; 27 ; 37 $T_n = 10n - 3$ $T_{52} = 10(52) - 3$ $= 517$ **OR/*OF*** 7 ; 17 ; 27 ; 37 By inspection the 52nd term will be 517 *Deur inspeksie is die* 52ste *term gelyk aan* 517	✓ n=105 ✓ Substitute/*Vervang* ✓ 517 ✓ Tn ✓ Substitute/*Vervang* ✓ 517 ✓ Pattern/*Patroon* ✓✓ 517	(3)
				[10]

QUESTION/*VRAAG* 4				
4.1	4.1.1	$x \in R$	✓ Answer/*Antwoord*	(1)
	4.1.2	$y > -4$ **OR/*OF*** $y \in (-4;\infty)$	✓ Answer/*Antwoord*	(1)
	4.1.3	$y = -3$	✓ Answer/*Antwoord*	(1)
4.2	$f(x) = a^x - 3$ subst/*vervang* $(-2;6)$ $6 = a^{-2} - 3$ $a^{-2} = 9$ $a^{-2} = \frac{1}{9}$ $a = \frac{1}{3} = 3^{-1}$		✓ Substitution/*Vervanging* ✓ $\frac{1}{3} = 3^{-1}$	(2)
4.3	x-intercept exponential graph:/*x-afsnit eksponensiële grafiek*: $3^{-x} - 3 = 0$ $3^{-x} = 3$ $x = -1$ **∴ C(− 1 ; 0)** **OR/*OF*** x-intercept hyperbola:/*x-afsnit hiperbool*: $\frac{-4}{x} - 4 = 0$ $\frac{-4}{x} = \frac{4}{1}$ **∴ C(− 1 ; 0)** $x = -1$		✓ Let/*Stel* $x = 0$ ✓ x value/*x-waarde* ✓ co-ordinate/*koördinaat*	(3)
4.4	$-1 < x < 0$ **OR/*OF*** $x \in (-1;0)$		✓ $x > -1$ ✓ $x < 0$	(2)
4.5	4.5.1	A(–2 ; 6) C(–1 ; 0) $m = \frac{6-0}{-2+1}$ $m = -6$ $y = -6x + c$ subst/*vervang* (–1;0) **OR/*OF*** subst/*vervang* (–2;6) $0 = -6(-1) + c$ $6 = -6(-2) + c$ $c = -6$ $\therefore y = -6x - 6$	✓ subst *into* $m = \frac{y_2 - y_1}{x_2 - x_1}$ *vervang in* $m = \frac{y_2 - y_1}{x_2 - x_1}$ ✓ $m = -6$ ✓ subst m and co-ordinate/*vervang m en koördinaat* ✓ equation/*vergelyking*	(4)
	4.5.2	$y = -x - 4$	✓ $-x$ ✓ -4	(2)

4.6	$g(x) = -\frac{4}{x} - 4$ and/*en* B(x ; 6) $-\frac{4}{x} - 4 = 6$ $-\frac{4}{x} = 10$ $x = -0,4$ AB = 2 − 0,4 = 1,6 units/*eenhede*	✓ Subst y = 6/V*ervang* y = *6* ✓ x value/ *x-waarde* ✓ 1,6	(3)
			[19]
QUESTION/*VRAAG* 5			
5.1		✓ Shape/*Vorm* ✓ x intercepts/ *x-afsnitte* ✓ Turning point/ *Draaipunt*	(3)
5.2	q = –8 Substitute (–4;0) or (4;0) to calculate a *Vervang (–4;0) of (4;0) om a te bereken* $y = ax^2 - 8$ $0 = a(4)^2 - 8$ $16a = 8$ $a = \frac{1}{2}$ $\therefore y = \frac{1}{2}x^2 - 8$	✓Subst coordinate and q = –8/ *Vervang koördinaat en q* = –8 ✓ $a = \frac{1}{2}$ ✓ Equation/ *Vergelyking*	(3)
5.3	–4 ≤ x ≤ 4 **OR/*OF*** $x \in$ [–4;4]	✓ $x \geq -4$ ✓ $x \leq 4$	(2)
5.4	$k(x) = -\frac{1}{2}x^2 + 2$	✓ $-\frac{1}{2}x^2$ ✓ +2	(2)
			[10]

QUESTION/*VRAAG* 6			
6.1	A = (1 + *in*) = 7 990(1 + (0,15 × 4)) ✓✓ = 7 990(1,60) = R12 784,00✓ = R12 784,00 ÷ 48 = R 266,33 ✓ Monthly payment including fees/*Maandelikse betalings insluitend fooie* = R266,33 + R13,50 = R 279,83 ✓	✓ Substitution in correct formula/*Vervanging in korrekte formule* ✓ Converting 48 months to 4 years/ *Omskakeling 48 maande tot 4 jaar* ✓ Total amount including interest/ *Totale bedrag insluitend rente* ✓ Monthly repayment/ *Maandelikse terugbetaling* ✓ Total monthly repayment/ *Totale maandeliks terugbetaling*	(5)
6.2	A= P(1+ *i)*^{n} ✓ = 5000(1 + 0,2)^{31} ✓✓✓ = R 1 424 257,88 ✓	✓ Correct formula/ *Korrekte formule* ✓ 20% to/*na* 0,2 ✓ 60 – 29, n=31 ✓ Substitution/ *Vervanging* ✓ Answer/*Antwoord*	(5)
			[10]

QUESTION/*VRAAG 7*				
7.1	7.1.1	P(A or/*of* B) = 1 – P(A or/*of* B)′ = 1 – 0,05 = 0,95	✓ 1 – P(A or/*of* B)′ ✓ Answer/*Antwoord*	(2)
	7.1.2	NO/NEE P(A) + P(B) ≠ P(A or/*of* B)	✓ no/*nee* ✓ Justification/ *Regverdiging*	(2)
	7.1.3	P(A or/*of* B) = P(A) + P(B) – P(A and/*en* B) P(A and/*en* B) = 0,25 + 0,89 – 0,95 = 0,19	✓ Formula/*formule* ✓ Answer/*Antwoord*	(2)
	7.1.4	P(B) = 0,89 – 0,19 = 0,6	✓ 0,89 – 0,19 ✓ Answer/*Antwoord*	(2)
7.2	7.2.1	 600 + 950 + 235 – 1 500 = 285	✓ 600 – 285 = 315(ADD) ✓ 950 – 285 = 665 (MULTIPLIER) ✓ 600 + 950 + 235 – 1 500 = 285 ✓ Correct diagram used/ *Korrekte diagram gebruik*	(4)
	7.2.2	$\frac{285}{1500} = \frac{19}{100}$	✓ Answer only/ *Slegs antwoord*	(1)
	7.2.3	$\frac{1500-950}{1500} = \frac{550}{1500}$ $= \frac{11}{30}$ **OR/*OF*** $\frac{315 + 235}{1500} = \frac{550}{1500} = \frac{11}{30}$	✓ $\frac{1500-950}{1500}$ ✓ $\frac{11}{30}$ **OR/*OF*** $\frac{315 + 235}{1500}$	(2)
				[15]
				TOTAL/*TOTAAL* : 100