

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	$2x^6 - 8$ $= 2(x^6 - 4)$ $= 2(x^3 + 2)(x^3 - 2)$	<ul style="list-style-type: none"> ✓ factorise/faktoriseer ✓ factorise/faktoriseer <p style="text-align: right;">(2)</p>
	1.1.2	$-x + (x - y)^3 + y$ $= (x - y)^3 - (x - y)$ $= (x - y)[(x - y)^2 - 1]$ $= (x - y)(x - y + 1)(x - y - 1)$	<ul style="list-style-type: none"> ✓ $-(x - y)$ ✓ common factor $(x - y)$ <i>gemeenskaplike faktor</i> $(x - y)$ ✓ $[(x - y)^2 - 1]$ ✓ diff. of two squares/ <i>verskil tussen twee</i> <i>vierkante</i> <p style="text-align: right;">(4)</p>
1.2	1.2.1	$\left(x^{\frac{1}{2}} - 3\right)^2$ $= x^{\frac{1}{4}} - 6x^{\frac{1}{2}} + 9$	<ul style="list-style-type: none"> ✓ $x^{\frac{1}{4}}$ and/en 9 ✓ $-6x^{\frac{1}{2}}$ <p style="text-align: right;">(2)</p>
	1.2.2	$x^{-3} \div x^{-5} + (x^{-2})^{-1}$ $= x^{-3-(-5)} + x^2$ $= x^2 + x^2$ $= 2x^2$	<ul style="list-style-type: none"> ✓ division x^{-3+5} and brackets/ <i>deel x^{-3+5} en hakies</i> ✓ simplify/vereenvoudig <p style="text-align: right;">(2)</p>
	1.2.3	$\frac{5^{x+1} \cdot (4^x)^3}{2^{5x-2} \cdot 10^{x-1}}$ $= \frac{5^{x+1} \cdot (2^{2x})^3}{2^{5x-2} \cdot (5 \cdot 2)^{x-1}}$ $= \frac{5^{x+1} \cdot 2^{6x}}{2^{5x-2} \cdot 5^{x-1} \cdot 2^{x-1}}$ $= 5^{x+1-x+1} \cdot 2^{6x-5x+2-x+1}$ $= 5^2 \cdot 2^3$ $= 200$	<ul style="list-style-type: none"> ✓ bases primefactors/ <i>basisse priemfaktore</i> ✓ simplify numerator/ <i>vereenvoudig teller</i> ✓ simplify denominator/ <i>vereenvoudig noemer</i> ✓ final answer/ <i>finale antwoord</i> <p style="text-align: right;">(4)</p>

	1.2.4	$\frac{-11}{2x^2 - 5x - 12} - \frac{1}{4 - x}$ $= \frac{-11}{(2x+3)(x-4)} + \frac{1}{x-4}$ $= \frac{-11+2x+3}{(2x+3)(x-4)}$ $= \frac{2x-8}{(2x+3)(x-4)}$ $= \frac{2(x-4)}{(2x+3)(x-4)}$ $= \frac{2}{2x+3}$	<ul style="list-style-type: none"> ✓ Factorise trinomial/ <i>Faktoriseer drieterm</i> ✓ Change of sign/ <i>Verandering van teken</i> ✓ Numerator/Teller ✓ LCD/KGV ✓ Simplified answer/ <i>Vereenvoudigde antwoord</i> 	(5)	
	1.3	$(3x+2)(2x-5)$ $= 6x^2 - 11x - 10$ $\therefore d = -11$	<ul style="list-style-type: none"> ✓ $(2x-5)$ ✓ Simplify/<i>Vereenvoudig</i> ✓ Answer/<i>Antwoord</i> 	(3)	
				[22]	
QUESTION/VRAAG 2					
2.1	2.1.1	$(3x-1)(x+2) = 0$ $x = \frac{1}{3} \text{ or/of } x = -2$	<ul style="list-style-type: none"> ✓ $\frac{1}{3}$ ✓ -2 	(2)	
	2.1.2	$3^x - 2 \cdot 3^{x-1} = 3$ $3^x(1 - 2 \cdot 3^{-1}) = 3$ $3^x \left(\frac{1}{3}\right) = 3$ $3^x = 3^2$ $x = 2$	<p>If answer ONLY NO marks/ <i>SLEGS antwoord</i> <i>GEEN punte nie</i></p>	<ul style="list-style-type: none"> ✓ Factorise/<i>Factorise</i> ✓ Simplify/<i>Vereenvoudig</i> ✓ Answer/<i>Antwoord</i> 	(3)
2.2	2.2.1	$-1 \leq 1 - \frac{2x}{3} < 5$ $-2 \leq -\frac{2x}{3} < 4$ $-6 \leq -2x < 12$ $3 \geq x > -6$ $-6 < x \leq 3$	<ul style="list-style-type: none"> ✓ Subtract 1 on both sides/ <i>Trek 1 aan albei kante af</i> ✓ $\times 3$ ✓ $\div(-2)$ and change of inequalities/<i>en</i> <i>verandering van</i> <i>ongelykhede</i> 	(3)	
	2.2.2	9 integers satisfy the equation/ <i>9 heelgetalle voldoen aan die vergelyking</i>	✓ Answer/ <i>Antwoord</i>	(1)	

<p>2.3</p>	<p>Solve for x and y simultaneously/<i>Los vir x en y gelyktydig op:</i></p> $x - y = 4 \quad \text{and/en} \quad \frac{x}{5} + \frac{y}{2} = 5$ $x = y + 4 \dots\dots(1) \quad 2x + 5y = 50 \dots\dots(2)$ <p>subst/<i>vervang</i> (1) into/<i>in</i> (2)</p> $2(y + 4) + 5y = 50$ $2y + 8 + 5y = 50$ $7y = 42$ $y = 6$ $x = 6$ $x = 10$ <p style="text-align: center;">OR/OF</p> $y = x - 4 \dots\dots(1)$ <p>subst/<i>vervang</i> (1) into/<i>in</i> (2)</p> $2x + 5(x - 4) = 50$ $2x + 5x - 20 = 50$ $7x = 70$ $x = 10$ $y = 10 - 4$ $y = 6$	<ul style="list-style-type: none"> ✓ Make x the subject of the equation (1)/<i>Maak x die onderwerp van die vergelyking (1)</i> ✓ LCD/<i>KGV</i> ✓ Substitute/<i>Vervang</i> ✓ y value/<i>y-waarde</i> ✓ x value/<i>x-waarde</i> ✓ Make y the subject of the equation (1)/<i>Maak y die onderwerp van die vergelyking (1)</i> ✓ Substitute/<i>Vervang</i> ✓ Simplify/<i>Vereenvoudig</i> ✓ x value/<i>x-waarde</i> ✓ y value/<i>y-waarde</i> 	<p>(5)</p>
		<p>[14]</p>	

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

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

4.6	$g(x) = -\frac{4}{x} - 4 \text{ and/en } B(x; 6)$ $-\frac{4}{x} - 4 = 6$ $-\frac{4}{x} = 10$ $x = -0,4$ $AB = 2 - 0,4$ $= 1,6 \text{ units/eenhede}$	<ul style="list-style-type: none"> ✓ Subst $y = 6$/Vervang $y = 6$ ✓ x value/ x-waarde ✓ 1,6 	(3)
			[19]
QUESTION/VRAAG 5			
5.1		<ul style="list-style-type: none"> ✓ Shape/Vorm ✓ x intercepts/ x-afsnitte ✓ Turning point/ Draaipunt 	(3)
5.2	$q = -8$ <p>Substitute $(-4;0)$ or $(4;0)$ to calculate a Vervang $(-4;0)$ of $(4;0)$ om a te bereken</p> $y = ax^2 - 8$ $0 = a(4)^2 - 8$ $16a = 8$ $a = \frac{1}{2}$ $\therefore y = \frac{1}{2}x^2 - 8$	<ul style="list-style-type: none"> ✓ Subst coordinate and $q = -8$/ Vervang koördinaat en $q = -8$ ✓ $a = \frac{1}{2}$ ✓ Equation/ Vergelyking 	(3)
5.3	$-4 \leq x \leq 4$ OR/OF $x \in [-4;4]$	<ul style="list-style-type: none"> ✓ $x \geq -4$ ✓ $x \leq 4$ 	(2)
5.4	$k(x) = -\frac{1}{2}x^2 + 2$	<ul style="list-style-type: none"> ✓ $-\frac{1}{2}x^2$ ✓ $+2$ 	(2)
			[10]

QUESTION/VRAAG 6			
6.1	$A = (1 + in)$ $= 7\,990(1 + (0,15 \times 4)) \checkmark\checkmark$ $= 7\,990(1,60)$ $= R12\,784,00 \checkmark$ $= R12\,784,00 \div 48$ $= R\,266,33 \checkmark$ Monthly payment including fees/ <i>Maandelikse betalings insluitend fooie</i> = R266,33 + R13,50 $= R\,279,83 \checkmark$	<ul style="list-style-type: none"> ✓ Substitution in correct formula/<i>Vervanging in korrekte formule</i> ✓ Converting 48 months to 4 years/<i>Omskakeling 48 maande tot 4 jaar</i> ✓ Total amount including interest/<i>Totale bedrag insluitend rente</i> ✓ Monthly repayment/<i>Maandelikse terugbetaling</i> ✓ Total monthly repayment/<i>Totale maandeliks terugbetaling</i> 	(5)
6.2	$A = P(1 + i)^n \checkmark$ $= 5000(1 + 0,2)^{31} \checkmark\checkmark\checkmark$ $= R\,1\,424\,257,88 \checkmark$	<ul style="list-style-type: none"> ✓ Correct formula/<i>Korrekte formule</i> ✓ 20% to/na 0,2 ✓ 60 – 29, n=31 ✓ Substitution/<i>Vervanging</i> ✓ Answer/<i>Antwoord</i> 	(5)
			[10]

QUESTION/VRAAG 7				
7.1	7.1.1	$P(A \text{ or/of } B) = 1 - P(A \text{ or/of } B)'$ $= 1 - 0,05$ $= 0,95$	✓ $1 - P(A \text{ or/of } B)'$ ✓ Answer/Antwoord	(2)
	7.1.2	NO/NEE $P(A) + P(B) \neq P(A \text{ or/of } B)$	✓ no/nee ✓ Justification/ Regverdiging	(2)
	7.1.3	$P(A \text{ or/of } B) = P(A) + P(B) - P(A \text{ and/en } B)$ $P(A \text{ and/en } B) = 0,25 + 0,89 - 0,95$ $= 0,19$	✓ 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	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center;">ADD MULTIPLIER</p> <p style="text-align: center;">$600 + 950 + 235 - 1\ 500 = 285$</p> </div>	✓ $600 - 285 = 315$ (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	$\frac{1500 - 950}{1500} = \frac{550}{1500}$ $= \frac{11}{30}$ <p>OR/OF</p> $\frac{315 + 235}{1500} = \frac{550}{1500} = \frac{11}{30}$	✓ $\frac{1500 - 950}{1500}$ ✓ $\frac{11}{30}$ OR/OF $\frac{315 + 235}{1500}$	(2)
				[15]
TOTAL/TOTAAL : 100				

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