



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION
PROVINSIALE EKSAMEN
NOVEMBER 2023
GRADE/GRAAD 10
MARKING GUIDELINES
NASIENRIGLYNE

MATHEMATICS/WISKUNDE (PAPER/VRAESTEL 1)

10 pages/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 het en dit nie oorgedoen het nie, sien die deurgehaalde antwoord na.*
- *Konsekwente akkuraatheid is van toepassing op ALLE aspekte van die nasienriglyne.*
- *Om waardes/antwoorde te aanvaar om 'n probleem op te los is onaanvaarbaar.*

MARKING GUIDELINES/ NASIENRIGLYNE	MATHEMATICS/WISKUNDE (PAPER/VRAESTEL 1) GRADE/GRAAD 10
--------------------------------------	---

QUESTION/VRAAG 1

1.1	$100 < 112 < 121$ $\therefore \sqrt{100} < \sqrt{112} < \sqrt{121} \checkmark$ $10 < \sqrt{112} < 11 \checkmark$ $\therefore \sqrt{112}$ lies between 10 and 11/ <i>lê tussen 10 en 11.</i>		1M calculation/ <i>berekening</i> 1M answer/ <i>antwoord</i>	(2)
1.2	1.2.1	$3x - 3 + 3x^2 \checkmark - x^2 + x - x^3 \checkmark$ $- x^3 + 2x^2 + 4x - 3 \checkmark$	1M multiply by 3/ <i>vermenigv met 3</i> 1M multiply by $-x$ / <i>vermenigv met $-x$</i> 1M simplify/ <i>vereenvoudig</i>	(3)
	1.2.2	$\frac{x+1}{2} - \frac{1-x}{17} + \frac{7}{34} = \frac{17(x+1) - 2(1-x) + 7}{34} \checkmark \checkmark$ $= \frac{19x+22}{34} \checkmark$	1 numerator/ <i>noemer</i> 1 LCD/KGV 1 answer/ <i>antwoord</i>	(3)
	1.2.3	$4^{x+3} \cdot 8^{1-x} \cdot 2^{x-9} = (2^2)^{x+3} \cdot (2^3)^{1-x} \cdot 2^{x-9} \checkmark$ $= 2^{2x+6} \cdot 2^{3-3x} \cdot 2^{x-9} \checkmark$ $= 2^0$ $= 1 \checkmark$	1M break up/ <i>opbreek</i> 1M simplify/ <i>vereenvoudig</i> 1M answer/ <i>antwoord</i>	(3)
1.3	1.3.1	$x^3 - 10x^2 + 21x$ $x(x^2 - 10x + 21) \checkmark$ $x(x-3)(x-7) \checkmark$	1M common factor/ <i>gemene faktor</i> 1 M answer/ <i>antwoord</i>	(2)
	1.3.2	$x^2 - z^2 + x + z$ $(x-z)(x+z) + (x+z) \checkmark$ $(x+z) \checkmark (x-z+1) \checkmark$	1M $(x-z)(x+z)$ 1M $(x+z)$ common factor/ <i>gemene faktor</i> 1M $(x-z+1)$	(3)

1.4	1.4.1	$(x-3)(2-x) = -2x$ $-x^2 + 5x - 6 = -2x \checkmark$ $x^2 - 7x + 6 = 0 \checkmark$ $(x-6)(x-1) = 0 \checkmark$ $\therefore x = 6 \text{ or/of } x = 1 \checkmark$	1M standard form/standaardvorm 1M multiplication/vermenigvuldiging 1M standard form/standaardvorm 1M factorisation/faktorisering 1M both correct answer/beide korrekte antwoorde.	(4)
	1.4.2	$3^{3x-1} = 3^{3x} - 18 \checkmark$ $3^{3x-1} - 3^{3x} = -18$ $3^{3x}(3^{-1} - 1) = -18 \checkmark$ $3^{3x} = 27 \checkmark$ $3x = 3$ $x = 1 \checkmark$	1M $27^x = 3^{3x}$ 1M common factor/gemene faktor 1M $= 27$ 1M answer/antwoord	(4)
1.5		$-3 \leq \frac{2x-1}{3} < -1$ $-9 \leq 2x-1 < -3 \checkmark$ $-8 \leq 2x < -2 \checkmark$ $-4 \leq x < -1 \checkmark$	1M multiply by 3/vermv met 3 1M add 1/tel 1 by 1M divide by 2/deel deur 2	(3)
1.6		$x + x + 1 + x + 2 = 39 \checkmark$ $3x = 36$ $x = 12 \checkmark$ $\therefore 12, 13, 14 \checkmark$	1M equation/vergelyking 1M $x = 12$ 1M full answer/volledige antwoord	(3)

1.7	Method/Metode: Substitution/Vervanging $2x + 4k = 20 \dots \text{eq/vgl 1}$ $7x + 3k = 19 \dots \text{eq/vgl 2}$ From equation 1/<i>Van vergelyking 1</i> $2x = 20 - 4k \text{ div by 2/deel by 2 } \checkmark$ $x = 10 - 2k \dots \text{Eq 3 sub into eq 2/Vgl 3 verv in vgl 2 } \checkmark$ $7(10 - 2k) - 3k = 19$ $70 - 14k - 3k = 19$ $-17k = -51 \text{ div both side by/deel albei kante deur } -17$ $k = 3 \text{ sub into eq 1/verv in vgl 1 } \checkmark$ $2x + 4(3) = 20$ $2x = 8$ $x = 4 \checkmark$ OR/OF $k = 3 \text{ sub into eq 2/verv in vgl 2 } \checkmark$ $7x - 3(3) = 19$ $7x = 28$ $x = 4$ $\therefore k = 3 \text{ and/en } x = 4 \checkmark$ OR/OF Method/Metode: Elimination/Uitskakeling $2x + 4k = 20 \dots \text{eq 1/vgl 1}$ $7x - 3k = 19 \dots \text{eq 2/vgl 2}$ $\text{eq 1/vgl 1 } \div 2 \dots x + 2k = 10 \checkmark$ $\text{eq 1/vgl 1 } \times 7 \dots 7x + 14k = 70$ $\text{eq 2/vgl 2 } \dots 7x - 3k = 19 \checkmark$ $\text{eq 1} - \text{eq 2/vgl 1} - \text{vgl 2} \dots 17k = 51$ $k = 3 \checkmark$ $\text{subst in eq1/verv in vgl 1} \quad 2x + 4(3) = 20$ $2x = 8$ $x = 4 \checkmark$	1M x the subject/x <i>die onderwerp</i> 1M subst x in eq 2/vervang x in vgl 2 1M $k = 3$ 1M $x = 4$ OR/OF 1M correct substitution/ <i>korrekte vervanging</i> 1M $x = 4$ 1M dividing and multiplication/ <i>deel en vermenigv</i> 1M correct subtraction/<i>korrekte aftreking</i> 1M value of k/<i>waarde van k</i> 1M value of x/<i>waarde van x</i>	(4)
			[34]

QUESTION/VRAAG 2

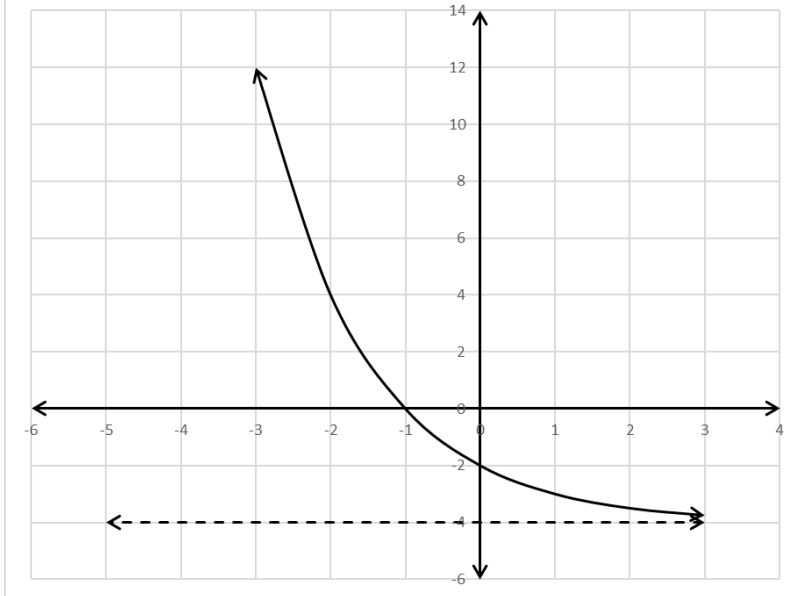
2.1	(a)	R4 000 ✓	1M correct answer/elke korrekte antwoord	(1)
	(b)	R7 000 ✓	1M correct answer/elke korrekte antwoord	(1)
2.2	$T_n = 3\,000n + 1\,000$ ✓✓		1M 3 000 m 1M + 1 000	(2)
2.3	Break-even/Gelykbreek is R250 000 $250\,000 = 3\,000n + 1\,000$ ✓ $\therefore n = \frac{249\,000}{3\,000}$ = 83 months/maande ✓ 83 months/maande is 249 000 + 1 month for/ maande vir 1 000 84 months/maande ✓ = 7 years/jaar ✓		1M equating to 250 000/ gelykstelling aan 250 000 1M answer/antwoord 1M adding 1 month/tel 1 maand by 1M answer in years/antwoord in jare	(4)
2.4	To make a profit of R30 000, Jamie will need an additional 10 months. (10 months will yield R30 000.) ✓/Om 'n wins van R30 000 te maak, sal Jamie 'n bykomende 10 maande nodig hê (10 maande sal R30 000 oplewer) Time taken for Jamie to reach R30 000 profit/ Tyd geneem vir Jamie om R30 000 wins te bereik = 7 years/jaar + 10 months/maande = 7 years/jaar 10 months/maande ✓		1M 10 months/10 maande 1M answer/antwoord	(2)
				[10]

QUESTION/VRAAG 3

3.1	3.1.1	$y \leq 9; y \in \mathbb{R}$ OR/OF $y \in (-\infty; 9)$ ✓	value and notation/waarde en notasie	(1)
	3.1.2	$x > 0; x \in \mathbb{R}$ OR/OF $x \in (0; \infty)$ ✓	value and notation/waarde en notasie	(1)
	3.1.3	$y = -1$ ✓	equation/vergelyking	(1)
	3.1.4	$x > 0$ OR/OF $x \in (0; \infty)$ ✓	value and notation/waarde en notasie	(1)
3.2	$q = 9$ ✓ x-intercept of/cruising van g $\frac{3}{x} - 1 = 0$ $\frac{3}{x} = 1$ $y = 3$ A(3 ; 0) ✓ subst A and T/P/verv A en draaipunt (0 ; 9) $y = ax^2 + q$ $0 = a(3)^2 + 9$ ✓ $9a = -9$ $a = -1$ ✓ $\therefore y = -x^2 + 9$		for/vir $q = 9$ point A/punt A substitute A and turning point/vervang A en draaipunt a value/waarde vir a	(4)
3.3	3.3.1	$h(x) = -(-x^2 + 9) - 3$ ✓ $h(x) = x^2 - 12$ ✓	correct subst/korrekte vervanging answer/antwoord	(2)
	3.3.2	(0 ; -12) ca from/van 3.3.1 ✓	ordered pair/koördinaat	(1)
3.4	$y = x^2 - 1$ ✓		$x - 1$	(2)

3.5	$f(1) = -(1)^2 + 9 \checkmark$ $f(1) = 8 \checkmark$ $g(1) = \frac{3}{1} - 1$ $g(1) = 2 \checkmark$ $CD = 6 \checkmark$ OR/OF $CD = f(x) - g(x)$ $-x^2 + 9 - \left(\frac{3}{x} - 1\right) \checkmark$ $= -(x)^2 + 9 - \frac{3}{x} + 1 \checkmark$ $= -(1)^2 + 9 - \frac{3}{1} + 1 \checkmark$ $= 6 \checkmark$	1M subst/vervang $f(1) = 8$ 1M $g(1) = 2$ 1M length/lengte 1M subtraction/aftrekking 1M simplification/ vereenvoudiging 1M subst/vervang $x = 1$ answer/antwoord	(4)
3.6	point of intersection/punt van snyding: $-x^2 + 9 = x + 3 \checkmark$ $x^2 + x - 6 = 0$ $(x + 3)(x - 2) = 0 \checkmark$ $x = -3$ or/of $x = 2 \checkmark$ $\therefore f(x) > x + 3$ when/wanneer $-3 < x < 2 \checkmark$	1M equate/gelykstel 1M standard form/standaard vorm 1M x -values/ x -waardes 1M inequality/ongelykheid	(4)
			[21]

QUESTION/VRAAG 4

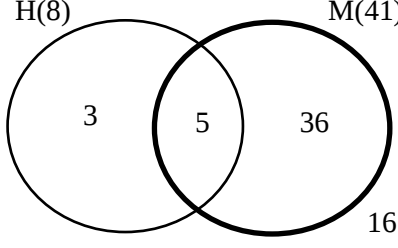
4.1	$y > -4; y \in \mathbb{R}$ OR/OF $y \in (-4; \infty)$ ✓		1M value and notation/ waarde en notasie	(1)
4.2	4.2.1	$2 \cdot 2^{-x} - 4 = 0$ ✓ $2 \cdot 2^{-x} = 4$ $2^{-x} = 2$ $x = -1$ ✓	1M let/laat $y = 0$ 1M x value/ x -waarde	(2)
	4.2.2	$y = 2 \cdot 2^0 - 4$ $y = -2$ ✓	1M y value/ y -waarde	(1)
4.3			1M shape/quadrant should be exponential graph and descending/ vorm/kwadrant moet eksponensiële grafiek en dalende wees 1M both intercepts ONLY if graph is exponential graph/ beide afsnitte SLEGS as grafiek eksponensiële grafiek is 1M asymptote ONLY if graph is exponential graph/asimptoot SLEGS as grafiek eksponensiële grafiek is	(3)
4.4	Reflection about the y -axis ✓ and translated 4 units upward ✓ / Refleksie oor die y -as ✓ en 4 eenhede opwaarts ✓		1M reflection y -axis/ refleksie y -as 1M 4 units up/4 eenhede opwaarts	(2)
				[9]

QUESTION/VRAAG 5

5.1	$R229 \times 24 \checkmark$ $= R5\,496 \checkmark$	1M multiply/ <i>vermenigv</i> answer/ <i>antwoord</i>	(2)
5.2	$A = P(1 + in)$ $5\,496 = P(1 + 0,075(2)) \checkmark$ $P = \frac{5\,496}{1,15}$ $P = 4\,779,13 \checkmark$	1M substitution into correct formula/ <i>vervanging in korrekte</i> <i>formule</i> 1M simplify/ <i>vereenvoudig</i>	(2)
5.3	Interest/ <i>Rente</i> = $5\,496 - 4\,779,13$ $= R716,87 \checkmark$	1M subtract/ <i>aftrek</i> 1M answer/ <i>antwoord</i>	(2)
5.4	$A = P(1 + i)^n$ $5\,100 = 4\,779,13 (1 + i)^2 \checkmark$ $(1 + i)^2 = 1,067139 \checkmark$ $i = 0,033 \checkmark$ $r = 3,3\% \checkmark$	1M subst. into correct formula/ <i>vervanging in</i> <i>korrekte formule</i> 1M <i>i</i> 1M rate/ <i>koers</i>	(3)
5.5	$250 \times 22,32 = R5\,580 \checkmark$	1M multiply/ <i>vermenigv</i> 1M answer/ <i>antwoord</i>	(2)
			[11]

QUESTION/VRAAG 6

6.1	6.1.1	$P(A \text{ or/of } B) = P(A) + P(B) - P(A \text{ and/en } B)$ $0,4 + k = 0,6 \checkmark$ $k = 0,2 \checkmark$	1M substitution/ <i>vervanging</i> 1M answer/ <i>antwoord</i> OR/OF 1M answer only/ <i>slegs</i> <i>antwoord</i> $\checkmark\checkmark$	(2)
	6.1.2	$P(A) + P(B) = 1 \checkmark$ $0,4 + k = 1$ $k = 0,6 \checkmark$	1M $P(A) + P(B) = 1$ 1M answer/ <i>antwoord</i> OR/OF 2M answer only/ <i>slegs</i> <i>antwoord</i> $\checkmark\checkmark$	(2)

6.2	6.2.1	$8 + 41 - x = 60 - 16 \checkmark$ $x = 5 \checkmark$	1M calculation/ <i>berekening</i> 1M answer/ <i>antwoord</i>	(2)
	6.2.2		1M-3 1M-36 1M-5 1M-16	(4)
	6.2.3	(a) $P(\text{H only/net } H) = \frac{3}{60}$ OR/OF $\frac{1}{20}$ OR/OF 0,05 OR/OF 5% $\checkmark$	1M answer/ <i>antwoord</i>	(1)
		(b) $P(\text{not/nie } M) = \frac{41}{60} \checkmark$ $\frac{19}{60} \checkmark$	1M-P(M) 1M answer/ <i>antwoord</i> OR/OF 1M answer only/ <i>slegs antwoord</i> $\checkmark\checkmark$	(2)
	6.2.4	$\frac{x}{41} = 0,927 \checkmark$ $x = 38,007$ 38 learners/ <i>leerders</i> $\checkmark$	1M calculation/ <i>berekening</i> 1M 38 learners/ <i>leerders</i>	(2)
				[15]
TOTAL/TOTAAL:				100