



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 10



MATHEMATICS P1/WISKUNDE VI

NOVEMBER 2018

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 100

**These marking guidelines consist of 10 pages.
*Hierdie nasienriglyne 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	$4x - x^3$ $= x(4 - x^2)$ $= x(2 - x)(2 + x)$	✓ common factor/gemeenskaplike faktor ✓ difference of two squares/verskil van twee kwadrate (2)
1.1.2	$x^2 + 15x - 54$ $= (x + 18)(x - 3)$	✓✓ factors/faktore (2)
1.1.3	$y - xy + x - 1$ $= y(1 - x) - 1(1 - x)$ $= (y - 1)(1 - x)$	✓ grouping/groepering ✓ change of sign/verandering van teken ✓ factors/faktore (3)
1.2.1	$(x + 2)(x^2 - x + 3)$ $= x^3 - x^2 + 3x + 2x^2 - 2x + 6$ $= x^3 + x^2 + x + 6$	✓ simplification/vereenvoudiging ✓ answer/antwoord (2)
1.2.2	$\frac{5}{x+3} - \frac{3}{2-x}$ $= \frac{5}{(x+3)} + \frac{3}{(x-2)}$ $= \frac{5(x-2) + 3(x+3)}{(x+3)(x-2)}$ $= \frac{5x - 10 + 3x + 9}{(x+3)(x-2)}$ $= \frac{8x - 1}{(x+3)(x-2)}$ <p>OR</p>	✓ LCD/KGN ✓ numerator/teller ✓ answer/antwoord (3)

	$\frac{5}{x+3} - \frac{3}{2-x}$ $= \frac{5(2-x) - 3(x+3)}{(x+3)(2-x)}$ $= \frac{10 - 5x - 3x - 9}{(x+3)(2-x)}$ $= \frac{1-8x}{(x+3)(2-x)}$	<p>✓ LCD/KGN</p> <p>✓ numerator/teller</p> <p>✓ answer/antwoord (3)</p>
1.2.3	$\frac{25^{-x} \cdot 15^{x+1}}{3^x \cdot 5^{-x}}$ $= \frac{5^{-2x} \cdot 3^{x+1} \cdot 5^{x+1}}{3^x \cdot 5^{-x}}$ $= 5^{-2x+x+1+x} \cdot 3^{x+1-x}$ $= 5^1 \cdot 3^1$ $= 15$	<p>✓ exponential law/eksponensiaalwet</p> <p>✓ simplification/vereenvoudiging</p> <p>✓ answer/antwoord (3)</p>
1.3	$(3p + q)^2$ $= 9p^2 + 6pq + q^2$ $= 9p^2 + q^2 + 6pq$ $= 12 + 6(-3)$ $= -6$	<p>✓ expansion/ontwikkeling</p> <p>✓ subst./verv.</p> <p>✓ answer/antwoord (3)</p>
		[18]



QUESTION/VRAAG 2		
2.1.1	$px + qx = a$ $x(p + q) = a$ $x = \frac{a}{p + q} ; p \neq -q$	✓ common factor/ <i>gemeenskaplike faktor</i> ✓ answer/ <i>antwoord</i> No restriction, FULL marks/ <i>Geen beperking nie/VOLPUNTE</i> (2)
2.1.2	$2x^2 - 5x + 2 = 0$ $(2x - 1)(x - 2) = 0$ $x = \frac{1}{2}$ or $x = 2$	✓ factors/ <i>faktore</i> ✓✓ answer/ <i>antwoord</i> (3)
2.1.3	$\left(\frac{1}{2}\right)^{3x+1} = 32$ $2^{-3x-1} = 2^5$ $-3x - 1 = 5$ $3x = -6$ $x = -2$	✓ base 2/ <i>grondtal 2</i> ✓ equating exponents/ <i>gelykstelling van eksponente</i> ✓ answer/ <i>antwoord</i> (3)
2.2.1	$-11 \leq 3m - 8 < 4$ $-3 \leq 3m < 12$ $-1 \leq m < 4$	✓ simplification/ <i>vereenvoudiging</i> ✓ answer/ <i>antwoord</i> (2)
2.2.2	5 integers/ <i>heelgetalle</i>	✓ answer/ <i>antwoord</i> (1)



<p>2.3</p> <p>$5x + 4y = 21 \dots\dots\dots(1)$ $2x = 3 - y \dots\dots\dots(2)$ $y = 3 - 2x \dots\dots\dots(3)$ sub (3) into (1) $5x + 4(3 - 2x) = 21$ $5x - 8x = 21 - 12$ $- 3x = 9$ $x = -3$ $y = 3 - 2(-3)$ $y = 9$ OR/OF $5x + 4y = 21 \dots\dots\dots(1) \times 1$ $2x + y = 3 \dots\dots\dots(2) \times 4$ $5x + 4y = 21 \dots\dots\dots(1)$ $8x + 4y = 12 \dots\dots\dots(3)$ $(3) - (1) : 3x = -9$ $x = -3$ Sub from (2) $y = 3 - 2(-3)$ $y = 9$</p>	<p>$5x + 4y = 21 \dots\dots\dots(1)$ $2x = 3 - y \dots\dots\dots(2)$ $y = 3 - 2x \dots\dots\dots(3)$ sub (3) into (1) $5x + 4(3 - 2x) = 21$ $5x - 8x = 21 - 12$ $- 3x = 9$ $x = -3$ $y = 3 - 2(-3)$ $y = 9$ OR/OF $5x + 4y = 21 \dots\dots\dots(1) \times 1$ $2x + y = 3 \dots\dots\dots(2) \times 4$ $5x + 4y = 21 \dots\dots\dots(1)$ $8x + 4y = 12 \dots\dots\dots(3)$ $(3) - (1) : 3x = -9$ $x = -3$ Sub from (2) $y = 3 - 2(-3)$ $y = 9$</p>	<p>✓ third equation/derde vergelyking ✓ subst./verv.</p> <p>✓ x value/x-waarde ✓ y value/y-waarde (4)</p> <p>OR/OF ✓ third equation/derde vergelyking ✓ subst./verv.</p> <p>✓ x value/x-waarde ✓ y value/y-waarde (4)</p>
		[15]



QUESTION/VRAAG 3		
3.1	$T_4 = 11$	✓ answer/antwoord (1)
3.2	$T_n = pn + q$ $= -3n + q$ $14 = -3(3) + q$ $q = 23$ $T_n = -3n + 23$	✓ subst./verv. ✓ q value/q-waarde (2)
3.3	$T_n = -3n + 23$ $- 3n + 23 = -103$ $3n = 126$ $n = 42$	✓ equating to -103/ gelykstelling aan -103 ✓ answer/antwoord (2)

3.4	$T_n < 0$ $-3n + 23 < 0$ $-3n < -23$ $n > \frac{23}{3}$ $\therefore n = 8$ $T_8 < 0$	$\checkmark T_n < 0$ \checkmark simplification/ <i>vereenvoudiging</i> \checkmark correct conclusion, i.e $n = 8$ / <i>korrekte</i> <i>afleiding, m.a.w. $n = 8$</i> (3)
3.5	$T_n = -3n + 23$ $T_{39} = -3(37) + 23$ $T_{39} = -88$	$\checkmark T_{39}$ \checkmark answer/antwoord (2)
		[10]

QUESTION/VRAAG 4		
4.1.1	$4^2 = 16$	\checkmark answer/antwoord (1)
4.1.2	$13^2 = 169$	\checkmark answer/antwoord (1)
4.1.3	$T_n = n^2$	\checkmark answer/antwoord (1)
4.2	$T_n = 2n - 1$ $43 = 2n - 1$ $44 = 2n$ $n = 22$ Total dots = $n^2 = 22^2$ $= 484$	$\checkmark T_n = 2n - 1$ $\checkmark n = 22$ \checkmark answer/antwoord (3)
		[6]



QUESTION/VRAAG 5		
5.1.1	D(0 ; -3)	✓ x value/x-waarde ✓ y value/y-waarde (2)
5.1.2	Range : $y > -4$	✓ answer/antwoord (1)
5.2.1	$0 = \left(\frac{1}{2}\right)^x - 4$ $2^{-x} = 4$ $2^{-x} = 2^2$ $x = -2$ A(-2 ; 0)	✓ equating to 0/ gelykstelling aan 0 ✓ answer/antwoord (2)
5.2.2	$f(x) = ax^2 + q$ $3 = a(1)^2 + q$ at E(1 ; 3) $3 = a + q$(1) $0 = a(-2)^2 + q$ at A(-2 ; 0) $0 = 4a + q$ $q = -4a$(2) $a = -1$ $q = 4$	✓ subst./verv. ✓ subst./verv. ✓ a value/a-waarde ✓ q value/q-waarde (4)
5.3.1	$CD = y_C - y_D$ $= 4 - (-3)$ $= 7$ units/eenhede	✓ subst./verv. ✓ answer/antwoord (2)
5.3.2	$y = mx + c$ $y = -\frac{3}{2}x + c$ $0 = -\frac{3}{2}(-2) + c$ $c = -3$ $y = -\frac{3}{2}x - 3$	✓ m value/m-waarde ✓ subst./verv. ✓ equation/ vergelyking (3)
5.4.1	$-2 < x < 2$ OR $x \in (-2 ; 2)$	✓ critical values/ kritieke waardes ✓ notation/notasie (2)
5.4.2	$x > 0$ OR $x \in (0 ; \infty)$	✓ answer/antwoord (1)
		[17]



QUESTION/VRAAG 6		
6.1.1	$g(x) = \frac{a}{x} + q$ $2 = \frac{a}{3} + 1$ $a = 3$ $\therefore g(x) = \frac{3}{x} + 1$	✓ $q = 1$ ✓ subst./verv. ✓ answer/antwoord (3)
6.1.2	$h(x) = x + 1$	✓ positive gradient/positiewe gradiënt ✓ answer/antwoord (2)
6.2		✓ shape of g / vorm van g ✓ asymptotes/asimptote ✓ positive gradient of h /positiewe gradiënt van h ✓ x intercepts of g and h 6/ x -afsnitte van g en h 6 (4)
6.4	$g(x) = -\left(\frac{3}{x} + 1\right) + 5$ $g(x) = -\frac{3}{x} + 4$ $x = 0$ $y = 4$	✓ equation of g / vergelyking van g ✓ $x = 0$ ✓ $y = 4$ (3)
		[12]

QUESTION/VRAAG 7		
7.1	Total amount pai / <i>Totale bedrag betaal</i> $= R229 \times 24$ $= R5\ 496$	✓ answer/ <i>antwoord</i> (1)
7.2	$A = P(1 + i.n)$ $R5496 = P(1 + 0,075 \times 2)$ $P = R4779,13$	✓ formula/ <i>formule</i> ✓ subst./ <i>verv.</i> (2)
7.3	Interest/ <i>Rente</i> $= R5496 - R4779,13$ $= R716,87$	✓ answer/ <i>antwoord</i> (1)
7.4	Insurance/ <i>Versekering</i> $= \frac{R4779,13 \times 0,115}{12}$ $= R45,80$ New monthly payments/ <i>Nuwe maandelikse paaieiment</i> $= R45,80 + R229$ $= R274,80$	✓ insurance per month/ <i>versekering per maand</i> ✓ dividing by 12/ <i>deling deur 12</i> ✓ answer/ <i>antwoord</i> (3)
7.5	$A = P(1 + i)^n$ $5100 = 4779,13(1 + i)^2$ $i = \sqrt{1,067139835} - 1$ $i = 0,03302460526$ Inflation rate/ <i>Inflasiekoers</i> = 3,30%	✓ formula/ <i>formule</i> ✓ subst./ <i>verv.</i> ✓ simplification/ <i>vereenvoudiging</i> ✓ answer/ <i>antwoord</i> (4)
		[11]



QUESTION/VRAAG 8		
8.1.1 (a)	$P(B) = 1 - P(B')$ $= 1 - \frac{3}{8}$ $= \frac{5}{8}$	✓ formula ✓ answer/antwoord (2)
8.1.1(b)	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $\frac{5}{7} = \frac{2}{5} + \frac{5}{8} - P(A \text{ and } B)$ $P(A \text{ and } B) = \frac{87}{280}$ $= 0,31$	✓ identity ✓ subst./verv. ✓ answer/antwoord (3)
8.1.2	Not mutually exclusive events. $P(A \text{ and } B) \neq 0$	✓ NOT/NIE ✓ reason/rede (2)
8.2.1	$P(A \cap B)$ OR $P(A \text{ and } B)$	✓ answer/antwoord (1)
8.2.2	$P(A \cup B)$ OR $P(A \text{ or } B)$	✓ answer/antwoord (1)
8.2.3	$P(A \cap B)$ OR $P(A \text{ and } B)$	✓ answer/antwoord (1)
8.3	8.2.3	✓ answer/antwoord (1)
		[11]
	TOTAL/TOTAAL	[100]