



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 10

MATHEMATICS P1/WISKUNDE VI

NOVEMBER 2019

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 100

**These marking guidelines consist of 11 pages./
*Hierdie nasienriglyne bestaan uit 11 bladsye.***

NOTE:

- If a candidate answered a *QUESTION/VRAAG 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/answer in order to solve a problem is unacceptable.

LET WEL:

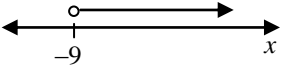
- *As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.*
- *Dit is onaanvaarbaar om waardes/antwoorde te veronderstel om 'n probleem op te los.*

QUESTION/VRAAG 1

1.1.1	$3y^2 + y$ $= y(3y + 1)$	✓ answer/antwoord (1)
1.1.2	$x^2 - 10x - 24$ $= (x - 12)(x + 2)$	✓ (x - 12) ✓ (x + 2) (2)
1.1.3	$9x^2 - y^2 + 10y - 25$ $= 9x^2 - (y^2 - 10y + 25)$ $= 9y^2 - (y - 5)^2$ $= (3x + y - 5)(3x - y + 5)$	✓ grouping/groepering ✓ factorising/faktorisering ✓ answer/antwoord (3)
1.2.1	$\left(4 + \frac{1}{x}\right)\left(2 - \frac{3}{x}\right)$ $= 8 - \frac{10}{x} - \frac{3}{x^2}$	✓✓ answer/antwoord (2)
1.2.2	$\frac{5x - 5}{5x}$ $= \frac{5(x - 1)}{5x}$ $= \frac{x - 1}{x}$ <p>OR/OF</p> $\frac{5x}{5x} - \frac{5}{5x}$ $= 1 - \frac{1}{x}$	✓ factorising/faktorisering ✓ answer/antwoord (2) ✓ separation/skeiding ✓ answer/antwoord (2)

1.2.3	$\frac{3^{x+1} + 3^x}{27 \cdot 3^{-1+x}}$ $= \frac{3^x \cdot 3 + 3^x}{27 \cdot 3^{-1} \cdot 3^x}$ $= \frac{3^x (3+1)}{3^x \cdot \frac{27}{3}}$ $= \frac{4}{9}$ <p>OR/OF</p> $\frac{3^{x+1} + 3^x}{27 \cdot 3^{-1+x}}$ $= \frac{3^x \cdot 3 + 3^x}{27 \cdot 3^{-1} \cdot 3^x}$ $= \frac{4 \cdot 3^x}{3^x \cdot \frac{27}{3}}$ $= \frac{4}{9}$	<p>✓ separating bases/<i>skei basisse</i></p> <p>✓ common factor/<i>gemeenskaplike faktor</i></p> <p>✓ answer/<i>antwoord</i> (3)</p> <p>✓ separating bases/<i>skei basiss</i></p> <p>✓ addition/<i>optelling</i></p> <p>✓ answer/<i>antwoord</i> (3)</p>
		[13]

QUESTION/VRAAG 2

2.1.1	$2x^2 - 10x = 0$ $2x(x - 5) = 0$ $x = 0$ or $x = 5$	✓ common factor/ <i>gemeenskaplike faktor</i> ✓ both values of/ <i>beide</i> <i>waardes van x</i> (2)												
2.1.2	$px - kx = k - p$ $x(p - k) = k - p$ $x = -\frac{k - p}{k - p}$ $x = -1$	✓ common factor/ <i>gemeenskaplike faktor</i> ✓ change of sign/ <i>verander</i> <i>teken</i> ✓ answer/ <i>antwoord</i> (3)												
2.1.3	$2^{\frac{x}{3}} = \frac{1}{128}$ $2^{\frac{x}{3}} = 2^{-7}$ $\frac{x}{3} = -7$ $x = -21$	✓ $\frac{1}{2^7}$ or/of 2^{-7} ✓ equating exponents/ <i>gelykstelling van</i> <i>eksponente</i> ✓ answer/ <i>antwoord</i> (3)												
2.2.1	$\frac{x+5}{2} > -2$ $x+5 > -4$ $x > -9$	✓ simplification/ <i>vereenvoudiging</i> ✓ answer/ <i>antwoord</i> (2)												
2.2.2		✓ number line/ <i>getalleglyn</i> (1)												
2.3	$x(x - 3) + y(3 - x) = 0$ $x(x - 3) - y(x - 3) = 0$ $(x - 3)(x - y) = 0$ $x = 3$ or $y = x = 3$	✓ change of sign/ <i>verander</i> <i>teken</i> ✓ common factor/ <i>gemeenskaplike faktor</i> ✓ x-value/ <i>-waarde</i> ✓ y-value/ <i>-waarde</i> (4)												
2.4	Let the number of R50 notes be x / <i>Laat die getal R50-note x wees.</i> <table border="1" data-bbox="268 1518 1018 1758"> <thead> <tr> <th></th> <th>Number of notes <i>Getal note</i></th> <th>Total value of money/<i>Totale</i> <i>warade van geld</i></th> </tr> </thead> <tbody> <tr> <td>R10</td> <td>$x + 15$</td> <td>$10(x + 15)$</td> </tr> <tr> <td>R20</td> <td>$2x$</td> <td>$20(2x)$</td> </tr> <tr> <td>R50</td> <td>x</td> <td>$50(x)$</td> </tr> </tbody> </table> $10(x + 15) + 20(2x) + 50x = 10150$ $100x = 10000$ $x = 100$ R10 Notes: $100 + 15 = 115$ R20 Notes: $2(100) = 200$ R50 Notes: $100 = 100$		Number of notes <i>Getal note</i>	Total value of money/ <i>Totale</i> <i>warade van geld</i>	R10	$x + 15$	$10(x + 15)$	R20	$2x$	$20(2x)$	R50	x	$50(x)$	✓ setting up equation/ <i>vergelyking/</i> <i>opstel van vergelyking</i> ✓ simplification/ <i>vereenvoudiging</i> ✓ x-value/ <i>-waarde</i> ✓ answer/ <i>antwoord</i> R10 notes = 115 R20 notes = 200 R50 notes = 100 (4)
	Number of notes <i>Getal note</i>	Total value of money/ <i>Totale</i> <i>warade van geld</i>												
R10	$x + 15$	$10(x + 15)$												
R20	$2x$	$20(2x)$												
R50	x	$50(x)$												
		[19]												

QUESTION/VRAAG 3

3.1.1	$5x + 7$	✓ answer/antwoord (1)
3.1.2	$T_n = mn + c$ $T_n = (x + 2)n + q$ $4x + 5 = xn + 2n + q$ $4x + 5 = 3x + 6 + q$ $x - 1 = q$ $\therefore T_n = (x + 2)n + (x - 1)$ $T_n = xn + 2n + x - 1$ OR/OF For $n = 1$: $(1 + 1) + (2(1) - 1)$ $n = 2$: $(2 + 1) + (2(2) - 1)$ $n = 3$: $(3 + 1) + (2(3) - 1)$ $Tn = (n + 1)x + (2n - 1)$ $T_n = xn + 2n + x - 1$	✓ substitution/vervanging/ vervanging ✓ simplification/ vereenvoudiging ✓ answer/antwoord (3) ✓✓ investigating/ondersoek ✓ answer/antwoord (3)
3.1.3	$T_{13} = 95$ $95 = 13x + 2(13) + x - 1$ $95 = 13x + 26 + x - 1$ $14x = 70$ $x = 5$	✓ substitution/vervanging/ vervanging ✓ answer/antwoord (2)
3.1.4	$T_n = 5n + 2n + 5 - 1$ $T_n = 7n + 4$ $7n + 4 < 158$ $7n < 154$ $n < 22$ $\therefore T_{21}$ is the first term less than 158./is die eerste term minder as 158	✓ $7n + 4 < 158$ ✓ $n < 22$ ✓ conclusion/gevolg-trekking (3)

3.2.1	$\text{Height/Hoogte} = 50 \times 44$ $= 2200 \text{ cm}$	✓ answer/antwoord (1)
3.2.2	$T_n = -0,1n + c$ $T_1 = 7,9$ $7,9 = -0,1 + c$ $\therefore c = 8$ $T_n = -0,1n + 8$ $T_{45} = -0,1(45) + 8$ $T_{45} = 3,5m$ OR/OF $7,9; 7,8; 7,7; \dots$ $7,9 = -0,1 \times 1 + 8 \dots \dots \dots (1)$ $7,8 = -0,1 \times 2 + 8 \dots \dots \dots (2)$ $7,7 = -0,1 \times 3 + 8 \dots \dots \dots (3)$ $T_n = -0,1 \times n + 8$ $T_n = -0,1n + 8$ $T_{45} = -0,1 \times 45 + 8$ $T_{45} = 3,5m$	✓ constant difference/ <i>konstante verskil</i> ✓ T_n ✓ answer/antwoord (3)
3.2.3	$\text{Area of Trapezium / Oppervlakte van trapesium} = \frac{1}{2}(AB + CD)H$ $= \frac{1}{2}(3,5 + 7,9)22$ $= 125,4 \text{ m}^2$	✓ formula/formule
		[16]

QUESTION/VRAAG 4

4.1.1	$\text{Deposit} = \frac{25}{100} \times R7950 = R1987,50$ $\text{Balance} = R7950 - R1987,50$ $= R5962,50$ <p>OR/OF</p> $\text{Balance} = \frac{75}{100} \times R7950 = R5962,50$	✓ deposit/ <i>deposito</i> ✓ balance/ <i>balans</i> (2) ✓ 75% ✓ answer/ <i>antwoord</i> ¶(2)
4.1.2	$A = P(1 + in)$ $A = R5962,50 \left(1 + \frac{15}{100} \times 2 \right)$ $A = R7751,25$ $\text{Monthly payment} = \frac{R7751,25}{24} + R70,75$ $= R393,72$	✓ substitution/ <i>vervanging</i> ✓ dividing by/ <i>deel deur</i> 24 ✓ adding insurance/ <i>voeg versekering by</i> ✓ answer/ <i>antwoord</i> (4)
4.2.1	$£55 \times R23,43$ $= R1288,65$	✓ answer/ <i>antwoord</i> (1)
4.2.2	$\text{Cost of a car/Koste van 'n motor} = \frac{5\,500}{23,43} \times 14,58$ $= £3\,422,54$ <p>∴ Car is more expensive in England /<i>Motor is duurder in Engeland</i></p> <p>OR/OF</p> $\text{Cost of a car/Koste van motor} = \frac{23,43}{14,58} \times 3500$ $= \$5624,49$ <p>∴ Car is more expensive in England /<i>Motor is duurder in Engeland</i></p>	✓ $\frac{5\,500}{23,43} \times 14,58$ ✓ £3 422,54 ✓ conclusion/ <i>gevolgtrekking</i> ✓ $\frac{23,43}{14,58} \times 3500$ ✓ \$5624,49 ✓ conclusion/ <i>gevolgtrekking</i> (3)
		[10]

QUESTION/VRAAG 5

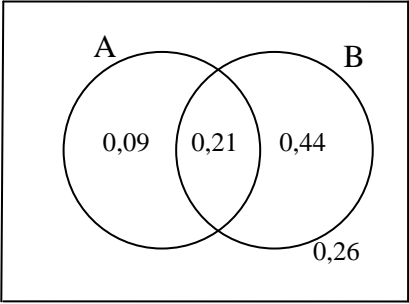
5.1.1	$q = 1$	✓ answer/antwoord (1)
5.1.2	$x \in \mathfrak{R}; x \neq 0$ OR/OF $x \in (-\infty; 0) \cup (0; \infty)$	✓ $x \in \mathfrak{R}$ ✓ $x \neq 0$ (2) ✓✓ answer/antwoord (2)
5.2.1	$y = -x + 1$	✓ negative gradient/ negatiewe gradiënt ✓ the value of/die waarde van c (2)
5.2.2	$x + 2 = 0$ $x = -2$ $0 = \frac{k}{-2} + 1$ $k = 2$ $\therefore f(x) = \frac{2}{x} + 1$	✓ $x = -2$ ✓ substitution $(-2; 0)$ ✓ $k = 2$ ✓ equation/vergelýking (4)
5.2.3	$f(x) = g(x)$ $\frac{2}{x} + 1 = x + 2$ $2 + x = x^2 + 2x$ $x^2 + x - 2 = 0$ $(x + 2)(x - 1) = 0$ $\therefore x = -2$ or $x = 1$ at A : $x = 1$; $y = 3$ A(1;3)	✓ equating/vergelýking ✓ standard form/ standaardvorm ✓ factorising/ faktoriserings ✓ x-values/-waardes ✓ answer/antwoord (5)
		[14]

QUESTION/VRAAG 6

6.1.1	$y = -4$	✓ answer/antwoord (1)
6.1.2	$q = -5$	✓ answer/antwoord (1)
6.1.3	$(2; 0)$	✓ answer/antwoord (1)
6.2.1	$g(x) = ax^2 - 5$ $(-2; 0): 0 = a(-2)^2 - 5$ $0 = 4a - 5$ $a = \frac{5}{4}$ $\therefore g(x) = \frac{5}{4}x^2 - 5$	✓ value of a ✓ equation/vergeliking/ waarde van 'n vergeliking (2)
6.2.2	$f(x) = k^x - 4$ $(-2; 0): 0 = k^{-2} - 4$ $0 = \frac{1}{k^2} - 4$ $4k^2 = 1$ $k^2 = \frac{1}{4}$ $k = \frac{1}{2}$ $\therefore f(x) = \left(\frac{1}{2}\right)^x - 4$	✓ substitution $(-2; 0)$ ✓ value of/waarde van k ✓ equation/vergeliking (3)
6.3	$y = \left(\frac{1}{2}\right)^0 - 4$ $y = -3$	✓ substitution/vervanging ✓ answer/antwoord (2)

<p>6.4</p>		<p><i>f</i>:</p> <ul style="list-style-type: none"> ✓ asymptotes of/asimptote van <i>f</i> ✓ y-intercept of/y-afsnitte van <i>f</i> ✓ shape of/vorm van <i>f</i> <p><i>g</i>:</p> <ul style="list-style-type: none"> ✓ x-intercepts/x-afsnitte ✓ turning point of/draaipunt van <i>g</i> ✓ shape of/vorm van <i>g</i> <p>(6)</p>
<p>[16]</p>		

QUESTION/VRAAG 7

7.1.1	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $0,74 = 0,30 + 0,65 - P(A \text{ and } B)$ $P(A \text{ and } B) = 0,21$	✓ substitution/vervanging ✓ answer/antwoord (2)
7.1.2		✓0,09 ✓0,21 ✓0,44 ✓0,26 (4)
7.1.3	No; $P(A \text{ and } B) \neq 0$. OR/OF No. There is an intesection	✓No/Nee ✓reason/rede (2)
7.2.1	$n(S) = 12$ $n(\text{square no.}) = 3 \text{ (i.e 1; 4; 9)}$ $P(\text{square no.}) = \frac{3}{12}$ $= \frac{1}{4}$	✓ answer/antwoord (1)
7.2.2	$P(\text{sum of the 2 numbers} = 2) = \frac{1}{144}$ $P(\text{sum of the 2 numbers greater than 2}) = 1 - \frac{1}{144}$ $= \frac{143}{144}$ $= 0,99$	✓ $\frac{1}{144}$ ✓Complementary rule/ Komplementêre reël ✓ answer/antwoord (3)
[12]		
TOTAL/TOTAAL:		[100]