



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 13 pages./
Hierdie nasienriglyne bestaan uit 13 bladsye.**

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X896, PRETORIA 0001
2019 -11- 12
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

Handwritten signature and date:
12/11/19

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/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.

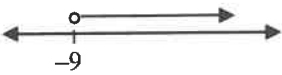
QUESTION/VRAAG 1

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	$9x^2 - y^2 + 10y - 25$ $= 9x^2 - (y^2 - 10y + 25)$ $= 9x^2 - (y - 5)^2$ $= (3x + y - 5)(3x - y + 5)$	✓ grouping/groepering ✓ factorising/faktorisering ✓ answer/antwoord (3)
1.2.1	$\left(4 + \frac{1}{x}\right)\left(2 - \frac{3}{x}\right)$ $= 4\left(2 - \frac{3}{x}\right) + \frac{1}{x}\left(2 - \frac{3}{x}\right)$ $= 8 - \frac{12}{x} + \frac{2}{x} - \frac{3}{x^2}$ $= 8 - \frac{10}{x} - \frac{3}{x^2}$ OR/OF $\left(4 + \frac{1}{x}\right)\left(2 - \frac{3}{x}\right)$ $= \left(\frac{4x+1}{x}\right)\left(\frac{2x-3}{x}\right)$ $= \frac{4x^2 - 12x + 2x - 3}{x^2}$ $= \frac{8x^2 - 10x - 3}{x^2}$	✓ expansion/uitbreiding ✓ answer/antwoord (2) ✓ multiplication ✓ answer/antwoord (2)

1.2.2	$\frac{5x-5}{5x}$ $= \frac{5(x-1)}{5x}$ $= \frac{x-1}{x}$ OR/OF $\frac{5x}{5x} - \frac{5}{5x}$ $= 1 - \frac{1}{x}$ Answer only: full marks	✓ factorising/faktoriserings ✓ answer/antwoord (2) ✓ separation/skeiding ✓ answer/antwoord (2)
1.2.3	$\frac{3^{x+1} + 3^x}{27 \cdot 3^{-1+x}}$ $= \frac{3^x \cdot 3 + 3^x}{27 \cdot 3^{-1} \cdot 3^x}$ $= \frac{3^x(3+1)}{3^x \cdot \frac{27}{3}}$ $= \frac{4}{9}$ OR/OF $\frac{3^{x+1} + 3^x}{27 \cdot 3^{-1+x}}$ $= \frac{3^x \cdot 3 + 3^x}{27 \cdot 3^{-1} \cdot 3^x}$ $= \frac{4 \cdot 3^x}{3^x \cdot \frac{27}{3}}$ $= \frac{4}{9}$	✓ separating bases/ skei basisse ✓ common factor/ gemeenskaplike faktor ✓ answer/antwoord (3) ✓ separating bases/ skei basisse ✓ addition/optelling ✓ answer/antwoord (3)
		[13]

QUESTION/VRAAG 2

2.1.1	$2x^2 - 10x = 0$ $2x(x - 5) = 0$ $x = 0$ or $x = 5$	Answer only: full marks	$x = 0$ ✓ $x = 5$ ✓ (2)
2.1.2	$px - kx = k - p$ $x(p - k) = k - p$ $x = \frac{k - p}{(p - k)}$ $x = -\frac{k - p}{k - p}$ $x = -1$		✓ common factor/ <i>gemeenskaplike faktor</i> ✓ dividing by $(p - k)$ ✓ answer/antwoord (3)
2.1.3	$2^{\frac{x}{3}} = \frac{1}{128}$ $2^{\frac{x}{3}} = 2^{-7}$ $\frac{x}{3} = -7$ $x = -21$ OR/OF $2^{\frac{x}{3}} = \frac{1}{128}$ $\left(2^{\frac{x}{3}}\right)^3 = \left(2^{-7}\right)^3$ $2^x = 2^{-21}$ $x = -21$ OR/OF $2^{\frac{x}{3}} = \frac{1}{128}$ $\frac{1}{2^{\frac{-x}{3}}} = \frac{1}{2^7}$ $-\frac{x}{3} = 7$ $x = -21$		✓ $\frac{1}{2^7}$ or/of 2^{-7} ✓ equating exponents/ <i>gelykstelling van eksponente</i> ✓ answer/antwoord (3) ✓ $\frac{1}{2^7}$ or/of 2^{-7} ✓ raising by exponent 3 ✓ answer (3) ✓ $\frac{1}{2^{\frac{-x}{3}}} = \frac{1}{2^7}$ ✓ equating exponents ✓ answer (3)
2.2.1	$\frac{x+5}{2} > -2$ $x+5 > -4$ $x > -9$		✓ simplification/ <i>vereenvoudiging</i> ✓ answer (2)

	OR/OF $\frac{x+5}{2} > -2$ $\frac{x}{2} + \frac{5}{2} > \frac{-4}{2}$ $x+5 > -4$ $x > -9$	✓ simplification/ <i>vereenvoudiging</i> ✓ answer (2)												
2.2.2		✓ number line/ <i>getallemlyn</i> (1)												
2.3	$x(x-3) + y(3-x) = 0$ $x(x-3) - y(x-3) = 0$ $(x-3)(x-y) = 0$ $x = 3 \text{ or } y = x = 3$	✓ change of sign/ <i>verander 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="274 936 1029 1182"> <thead> <tr> <th></th><th>Number of notes <i>Getal note</i></th><th>Total value of money/<i>Totale waarde 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> $10(x+15) + 20(2x) + 50x = 10150$ $100x = 10000$ $x = 100$ $\text{R10 Notes : } 100 + 15 = 115$ $\text{R20 Notes : } 2(100) = 200$ $\text{R50 Notes : } 100 = 100$		Number of notes <i>Getal note</i>	Total value of money/ <i>Totale waarde van geld</i>	R10	$x + 15$	$10(x+15)$	R20	$2x$	$20(2x)$	R50	x	$50(x)$	✓ method/ <i>metode</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 waarde 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	$T_n = mn + c$ $T_n = (x + 2)n + q$ $4x + 5 = xn + 2n + q$ $4x + 5 = 3x + 6 + q$ $x - 1 = q$ $\therefore T_n = (x + 2)n + (x - 1)$ OR/OF $T_0 = 2x + 1 - (x + 2) = x - 1$ $T_n = dn + T_0$ $T_n = (x + 2)n + (x - 1)$ OR/OF For $n = 1: (1 + 1) + (2(1) - 1)$ $n = 2: (2 + 1) + (2(2) - 1)$ $n = 3: (3 + 1) + (2(3) - 1)$ $T_n = (n + 1)x + (2n - 1)$ $T_n = xn + 2n + x - 1$	✓ $m = (x + 2)$ ✓ $q = (x - 1)$ ✓ answer/antwoord (3) ✓ $T_0 = (x - 1)$ ✓ $d = (x + 2)$ ✓ 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	$T_n = 5n + 2n + 5 - 1$ $T_n = 7n + 4$ $7n + 4 < 158$ $7n < 154$ $n < 22$ $\therefore$ The largest value of n is 21.	✓ $7n + 4 < 158$ ✓ $n < 22$ ✓ conclusion/gevolg- trekking (3)

3.2.1	Height/ <i>Hoogte</i> = 50×44 = 2200 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 $T_n = -10n + c$ $T_1 = 790$ $790 = -10 + c$ $\therefore c = 800$ $T_n = -10n + 800$ $T_{45} = -10(45) + 800$ $T_{45} = 350cm$ $T_{45} = 3,5m$ 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) ✓ constant difference/ <i>konstante verskil</i> ✓ T_n ✓ answer/antwoord (3) ✓ general term/algemene term ✓ substitution/vervanging ✓ answer/antwoord (3)
3.2.3	<i>Area of Trapezium/ Oppervlakte van trapesium</i> = $\frac{1}{2}(AB + CD)H$ $= \frac{1}{2}(7,9 + 3,5)22$ $= 125,4 m^2$	✓ formula/formule ✓ substitution/vervanging ✓ answer/antwoord (3)

	OR/OF Area of rectangle = $L \times B$ $= 7,9 \times 22$ $= 173,80m^2$ Area of TWO right angled triangles = $2 \times \frac{1}{2} \times base \times height$ $= 2 \times \frac{1}{2} \times 2,2 \times 22$ $= 48,40m^2$ Area of trapezium = $173,80m^2 - 48,40m^2$ $= 125,4m^2$ OR/OF Area of rectangle = $L \times B$ $= 3,5 \times 22$ $= 77m^2$ Area of TWO right angled triangles = $2 \times \frac{1}{2} \times base \times height$ $= 2 \times \frac{1}{2} \times 2,2 \times 22$ $= 48,40m^2$ Area of trapezium = $77m^2 + 48,40m^2$ $= 125,4m^2$ OR/OF Area of triangle ADC = $\frac{1}{2} \times base \times height$ $= \frac{1}{2} \times 3,5 \times 22$ $= 38,5m^2$ Area of triangle ABC = $\frac{1}{2} \times base \times height$ $= \frac{1}{2} \times 7,7 \times 22$ $= 86,9m^2$ Area of trapezium = $38,5m^2 + 86,9m^2$ $= 125,4m^2$	✓ area of rectangle ✓ areas of triangles ✓ answer (3) ✓ area of rectangle ✓ areas of triangles ✓ answer (3) ✓ area of triangle ADC ✓ areas of triangle ABC ✓ answer (3) [16]
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QUESTION/VRAAG 4

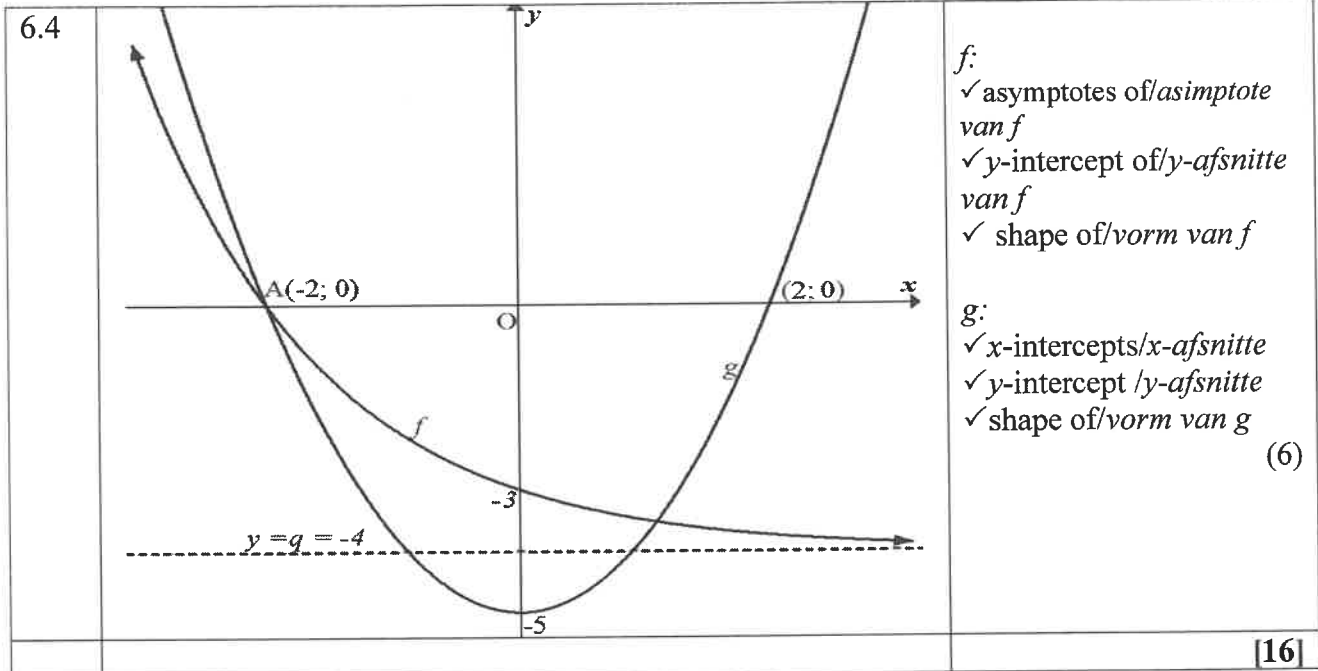
4.1.1	$\text{Deposit} = \frac{25}{100} \times R7950 = R1987,50$ $\text{Balance} = R7950 - R1987,50$ $= R5962,50$ Answer only: full marks OR/OF $\text{Balance} = \frac{75}{100} \times R7950 = R5962,50$	✓ deposit/deposito ✓ balance/balans (2) ✓ 75% ✓ answer/antwoord (2)
4.1.2	$A = P(1 + in)$ $A = R5962,50 \left(1 + \frac{15}{100} \times 2 \right)$ $A = R7751,25$ $\text{Monthly payment} = \frac{R7751,25}{24} + R70,75$ $= R393,72$	✓ substitution/vervanging ✓ dividing by 24/ <i>deel deur 24</i> ✓ adding insurance/ <i>voeg versekering by</i> ✓ answer/antwoord (4)
4.2.1	$£55 \times R23,43$ $= R1288,65$	✓ answer/antwoord (1)
4.2.2	Cost of car from England (in rands): $= £3500 \times R23,43$ $= R82005$ Cost of car from US (in rands): $= \$5500 \times R14,58$ $= R80190$ ∴ Car is more expensive in England / <i>Motor is duurder in Engeland</i> OR / OF $\text{Cost of a car/Koste van 'n motor} = \frac{5\,500}{23,43} \times 14,58$ $= £3\,422,54$ ∴ Car is more expensive in England / <i>Motor is duurder in Engeland</i> OR/OF $\text{Cost of a car/Koste van motor} = \frac{23,43}{14,58} \times 3500$ $= \$5624,49$ ∴ Car is more expensive in England / <i>Motor is duurder in Engeland</i>	✓ R82005 ✓ R80190 ✓ conclusion/ <i>gevolg-trekking</i> (3) ✓ $\frac{5\,500}{23,43} \times 14,58$ ✓ £3 422,54 ✓ conclusion/gevolg- <i>trekking</i> (3) ✓ $\frac{23,43}{14,58} \times 3500$ ✓ \$5624,49 ✓ conclusion/ <i>gevolgtrekking</i> (3)
		[10]

QUESTION/VRAAG 5

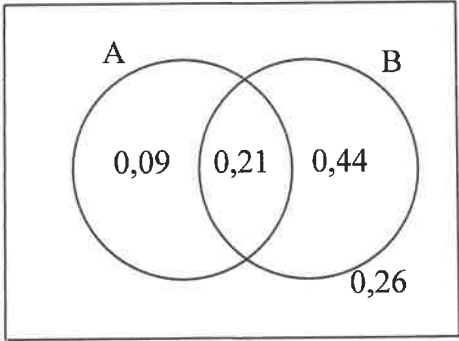
5.1.1	$q = 1$	✓ answer/antwoord (1)
5.1.2	$x \in \mathbb{R}; x \neq 0$ OR/OF $x \in (-\infty; 0) \cup (0; \infty)$ OR/OF $x \in (-\infty; \infty); x \neq 0$	✓ $x \in \mathbb{R}$ ✓ $x \neq 0$ (2) ✓✓ answer/antwoord (2) ✓ $x \in (-\infty; \infty)$ ✓ $x \neq 0$ (2)
5.2.1	$y = -x + 1$	✓ c value ✓ equation with negative gradient (2)
5.2.2	$x + 2 = 0$ $x = -2$ $0 = \frac{k}{-2} + 1$ $k = 2$ $\therefore f(x) = \frac{2}{x} + 1$	✓ $x = -2$ ✓ substituti on $(-2; 0)$ ✓ $k = 2$ ✓ equation/vergel yking (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/vergel yking ✓ standard form/ standaardvorm ✓ factorising/ faktoriser ing ✓ 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	$g(x) = ax^2 - 5$ $(-2; 0): 0 = a(-2)^2 - 5$ $0 = 4a - 5$ $a = \frac{5}{4}$ $\therefore g(x) = \frac{5}{4}x^2 - 5$ OR/OF $g(x) = ax^2 - 5$ $(2; 0): 0 = a(2)^2 - 5$ $0 = 4a - 5$ $a = \frac{5}{4}$ $\therefore g(x) = \frac{5}{4}x^2 - 5$	✓ value of a ✓ equation/vergelýking/ waarde van 'n vergelýking (2)
6.2.2	$f(x) = k^x - 4$ $(-2; 0): 0 = k^{-2} - 4$ $0 = \frac{1}{k^2} - 4$ $4k^2 = 1$ $k^2 = \frac{1}{4}$ $k = \frac{1}{2}$ $\therefore f(x) = \left(\frac{1}{2}\right)^x - 4$	✓ substituti on $(-2; 0)$ ✓ value of k / waarde van k ✓ equation/vergelýking (3)
6.3	$y = \left(\frac{1}{2}\right)^0 - 4$ $y = -3$	✓ substitution/vervanging ✓ answer/antwoord (2)



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 intersection.	✓ No/Nee ✓ reason/rede (2) ✓ No/Nee ✓ reason/rede (2)
7.2.1	$n(S) = 12$ $n(\text{square no.}) = 3$ (i.e 1 ; 4 ; 9) $P(\text{square no.}) = \frac{3}{12}$ $= \frac{1}{4} = 0,25 = 25\%$	✓ answer/antwoord (1)
7.2.2	$P(\text{sum of the 2 numbers} = 2) = \frac{1}{144}$ $P(\text{sum of the 2 numbers greater than 2}) = 1 - \frac{1}{144}$ $= \frac{143}{144}$ $= 0,99$ $= 99\%$	✓ $\frac{1}{144}$ ✓ Complementary rule/ Komplementêre reël ✓ answer/antwoord (3)
		[12]
	TOTAL/TOTAAL:	[100]