



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 10

MATHEMATICS P1/WISKUNDE VI

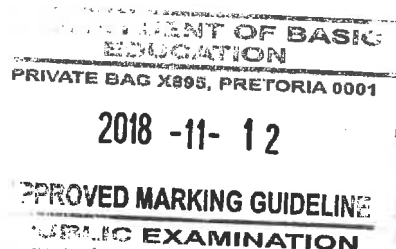
NOVEMBER 2018

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 100

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

Approved
[Signature]
11/11/2018



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.

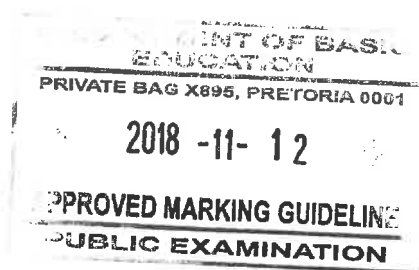
LET WEL:

- *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	$4x - x^3$ $= x(4 - x^2)$ $= x(2 - x)(2 + x)$	OR/OF	$4x - x^3$ $= -x(x^2 - 4)$ $= -x(x - 2)(x + 2)$	✓ common factor/gemeenskaplike faktor ✓ difference of two squares/verskil van twee kwadrate (2)
1.1.2	$x^2 + 15x - 54$ $= (x + 18)(x - 3)$	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> If correct factors, incorrect signs : 1/2 marks </div>		✓✓ factors/faktore (2)
1.1.3	$y - xy + x - 1$ $= y(1 - x) - 1(1 - x)$ $= (y - 1)(1 - x)$	OR/OF	$y - xy + x - 1$ $= y - 1 - x(y - 1)$ $= (y - 1)(1 - x)$	✓ first common factor or group (y - 1) ✓ second common factor ✓ answer (3)
1.2.1	$(x + 2)(x^2 - x + 3)$ $= x^3 - x^2 + 3x + 2x^2 - 2x + 6$ $= x^3 + x^2 + x + 6$	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> Answer only : 2/2 marks </div>		✓ simplification/vereenvoudiging ✓ answer/antwoord (2)
1.2.2	$\frac{5}{x+3} - \frac{3}{2-x}$ $= \frac{5(2-x) - 3(x+3)}{(x+3)(2-x)}$ $= \frac{10 - 5x - 3x - 9}{(x+3)(2-x)}$ $= \frac{1 - 8x}{(x+3)(2-x)}$ OR		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto; text-align: center;"> <p>DEPARTMENT OF BASIC EDUCATION PRIVATE BAG X895, PRETORIA 0001</p> <p>2018 -11- 12</p> <p>APPROVED MARKING GUIDELINE PUBLIC EXAMINATION</p> </div>	✓ $(x + 3)(2 - x)$ ✓ $5(2 - x) - 3(x + 3)$ ✓ answer/antwoord (3)



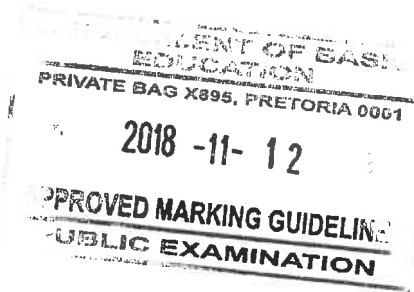
	$\frac{5}{x+3} - \frac{3}{2-x}$ $= \frac{5}{(x+3)} + \frac{3}{(x-2)}$ $= \frac{5(x-2) + 3(x+3)}{(x+3)(x-2)}$ $= \frac{5x - 10 + 3x + 9}{(x+3)(x-2)}$ $= \frac{8x - 1}{(x+3)(x-2)}$	<p>✓ $(x+3)(x-2)$ ✓ $5(x-2) + 3(x+3)$</p> <p>✓ answer/antwoord (3)</p>
1.2.3	$\frac{25^{-x} \cdot 15^{x+1}}{3^x \cdot 5^{-x}}$ $= \frac{5^{-2x} \cdot 3^{x+1} \cdot 5^{x+1}}{3^x \cdot 5^{-x}}$ $= 5^{-2x+x+1+x} \cdot 3^{x+1-x}$ $= 5^1 \cdot 3^1$ $= 15$	<p>✓ 5^{-2x} ✓ $3^{x+1} \cdot 5^{x+1}$</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	$px + qx = a$ $x(p + q) = a$ $x = \frac{a}{p + q} ; p \neq -q$	<div style="border: 1px solid black; padding: 5px; display: inline-block;">No restriction: 2/2 marks</div> ✓ common factor/gemeenskaplike faktor ✓ answer/antwoord (2)	
2.1.2	$2x^2 - 5x + 2 = 0$ $(2x - 1)(x - 2) = 0$ $x = \frac{1}{2}$ or $x = 2$	✓ factors/faktore ✓✓ ca answer from factors/va antwoord van faktors (3)	
2.1.3	$\left(\frac{1}{2}\right)^{3x+1} = 32$ $2^{-3x-1} = 2^5$ $-3x - 1 = 5$ $3x = -6$ $x = -2$	$\left(\frac{1}{2}\right)^{3x+1} = 32$ $\left(\frac{1}{2}\right)^{3x+1} = \left(\frac{1}{2}\right)^{-5}$ $3x + 1 = -5$ $3x = -6$ $x = -2$	✓ $2^{-3x-1} = 2^5$ or $\left(\frac{1}{2}\right)^{3x+1} = \left(\frac{1}{2}\right)^{-5}$ ✓ equating exponents/gelykstelling van eksponente ✓ answer/antwoord (3)
2.2.1	$-11 \leq 3m - 8 < 4$ $-3 \leq 3m < 12$ $-1 \leq m < 4$	$-3 \leq 3m < 12$ ✓ answer/antwoord (2)	
2.2.2	5 integers/heelgetalle	✓ answer/antwoord (1)	
2.3	$5x + 4y = 21 \dots\dots\dots(1)$ $2x = 3 - y \dots\dots\dots(2)$ $y = 3 - 2x \dots\dots\dots(3)$ sub (3) into (1) $5x + 4(3 - 2x) = 21$ $5x - 8x = 21 - 12$ $-3x = 9$ $x = -3$ $y = 3 - 2(-3)$ $y = 9$	$y = 3 - 2x$ ✓ subst./verv. ✓ x value/x-waarde ✓ y value/y-waarde (4)	

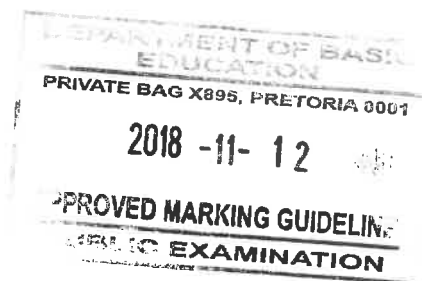
OR/OF

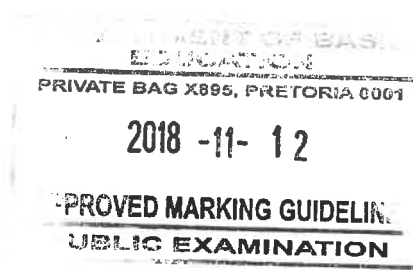
OR/OF



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	<p> $5x + 4y = 21 \dots\dots\dots(1)$ $2x = 3 - y \dots\dots\dots(2)$ $x = \frac{3-y}{2} \dots\dots\dots(3)$ sub (3) into (1) $5\left(\frac{3-y}{2}\right) + 4y = 21$ $5(3-y) + 8y = 42$ $3y = 27$ $y = 9$ $x = -3$ 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> $\checkmark x = \frac{3-y}{2}$ \checkmark subst./verv. \checkmark y value/y-waarde \checkmark x value/x-waarde (4) OR/OF $\checkmark 8x + 4y = 12$ \checkmark method \checkmark x value/x-waarde \checkmark y value/y-waarde (4) </p>
	<p>[15]</p>	

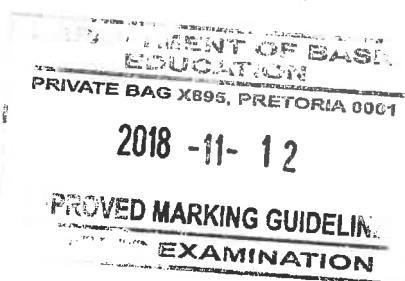


QUESTION/VRAAG 3		
3.1	$T_4 = 11$	✓ answer/antwoord (1)
3.2	$T_n = pn + q$ $= -3n + q$ $14 = -3(3) + q$ $q = 23$ $T_n = -3n + 23$	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Answer only: 2/2 marks</div> ✓ common difference = -3 ✓ answer (2)
3.3	$T_n = -3n + 23$ $-3n + 23 = -103$ $3n = 126$ $n = 42$	✓ equating to -103/ gelykstelling aan -103 ✓ answer/antwoord (2)
3.4	$T_n < 0$ $-3n + 23 < 0$ $-3n < -23$ $n > \frac{23}{3}$ (7,666...) $\therefore n = 8$ OR/OF 20 ; 17 ; 14 ; 11 ; 8 ; 5 ; 2 ; -1 n = 8 terms	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">Answer only: 1/3 marks</div> ✓ $T_n < 0$ ✓ simplification/ vereenvoudiging ✓ correct conclusion, i.e $n = 8$ /korrekte afleiding, m.a.w. $n = 8$ (3) ✓✓ expansion ✓ answer (3)
3.5	$T_n = -3n + 23$ $T_{37} = -3(37) + 23$ $T_{37} = -88$ OR/OF $T_n = -6n + 26$ $T_{19} = -6(19) + 26$ $T_{19} = -88$ OR/OF 20 ; 17 ; 14 ; 11 ; 8 ; 5 ; 2 ; -1 ; -4 ; -7 ; -10 ; -13 ; -16 ; -19 ; -22 ; -25 ; -28 ; -31 ; -34 ; -37 ; -40 ; -43 ; -46 ; -49 ; -52 ; -55 ; -58 ; -61 ; -64 ; -67 ; -70 ; -73 ; -76 ; -79 ; -82 ; -85 ; -88 Answer = -88	<div style="text-align: center;">  </div> ✓ $-3(37) + 23$ ✓ answer/antwoord (2) ✓ $-6(19) + 26$ ✓ answer/antwoord (2) ✓ expansion ✓ answer (2)

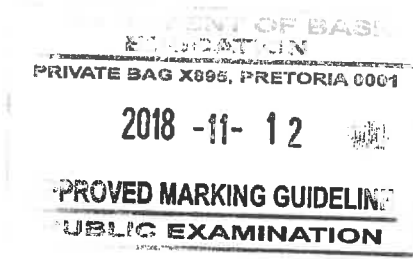


QUESTION/VRAAG 4		
4.1.1	$4^2 = 16$	✓ answer/antwoord (1)
4.1.2	$13^2 = 169$	✓ answer/antwoord (1)
4.1.3	$T_n = n^2$	✓ answer/antwoord (1)
4.2	$T_n = 2n - 1$ $43 = 2n - 1$ $44 = 2n$ $n = 22$ Total dots = $n^2 = 22^2$ $= 484$ OR/OF $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19 + 21 + 23 + 25 + 27 + 29 + 31 + 33 + 35 + 37 + 39 + 41 + 43$ $= 484$	✓ $T_n = 2n - 1$ ✓ $n = 22$ ✓ answer/antwoord (3) ✓✓ correct expansion ✓ answer (3)
		[6]

QUESTION/VRAAG 5		
5.1.1	D(0 ; -3)	✓ x value/x-waarde ✓ y value/y-waarde (2)
5.1.2	$y > -4$ OR/OF $y \in (-4 ; \infty)$	✓ 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 g to 0/ gelykstelling aan 0 <div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 10px 0;"> Answer only of A(-2 ; 0): 2/2 marks </div> ✓ answer as a coordinate/antwoord as 'n koordinaat (2)

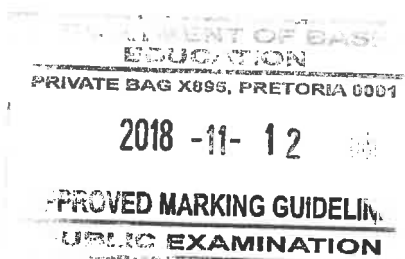


<p>5.2.2</p>	$f(x) = ax^2 + q$ $3 = a(1)^2 + q \quad \text{at } E(1 ; 3)$ $3 = a + q \dots\dots\dots(1)$ $0 = a(-2)^2 + q \quad \text{at } A(-2 ; 0) \text{ or } B(2 ; 0)$ $0 = 4a + q$ $q = -4a \dots\dots\dots(2)$ $a = -1$ $q = 4$ <p>OR/OF</p> $y = a(x-2)(x+2)$ $3 = a(1-2)(1+2)$ $3 = -3a$ $a = -1$ $y = -(x^2 - 4)$ $y = -x^2 + 4$ $q = 4$	<p>✓ subst. (1 ; 3)/ verv. (1 ; 3)</p> <p>✓ subst. coordinates of A or B/verv. die coordinate van A of B</p> <p>✓ a value/a-waarde</p> <p>✓ q value/q-waarde (4)</p> <p>✓ $y = a(x-2)(x+2)$</p> <p>✓ subst of (1 ; 3)</p> <p>✓ a value</p> <p>✓ q value (4)</p>
<p>5.3.1</p>	<p>C(0 ; 4) D(0 ; -3)</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Answer only: 2/2 marks</p> </div> $CD = y_C - y_D$ $= 4 - (-3)$ $= 7 \text{ units/eenhede}$ <p>OR/OF</p> $CD = \sqrt{(0-0)^2 + (4-(-3))^2}$ $= \sqrt{49}$ $= 7$	<p>✓ C(0 ; 4) (indicated or implied)</p> <p>✓ answer/antwoord (2)</p> <p>✓ C(0 ; 4) (indicated or implied)</p> <p>✓ answer/antwoord (2)</p>
<p>5.3.2</p>	$m = \frac{0 - (-3)}{-2 - (0)}$ $m = -\frac{3}{2}$ $y = -\frac{3}{2}x - 3$	<p>✓ subst. into gradient/verv.</p> <p>✓ m value/m-waarde</p> <p>✓ equation/ vergelyking (3)</p>
<p>5.4.1</p>	<p>$-2 < x < 2$ OR $x \in (-2 ; 2)$</p>	<p>✓ critical values/ kritieke waardes</p> <p>✓ notation/notasie (2)</p>
<p>5.4.2</p>	<p>$x > 0$ OR $x \in (0 ; \infty)$</p>	<p>✓ answer/antwoord (1)</p>

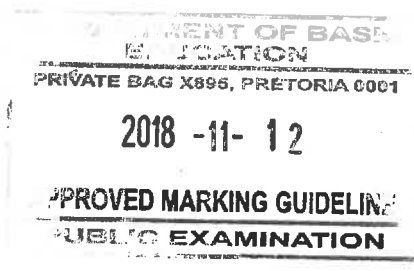


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QUESTION/VRAAG 6		
6.1.1	$g(x) = \frac{a}{x} + q$ $2 = \frac{a}{3} + 1$ $a = 3$ $\therefore g(x) = \frac{3}{x} + 1$	✓ $q = 1$ ✓ subst. of (3 ; 2)/verv. van (3 ; 2) ✓ a value (3)
6.1.2	$h(x) = x + 1$ <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">Answer only: 2/2 marks</div>	✓ $m = 1$ ✓ answer/antwoord (2)
6.2		<p>g:</p> ✓ shape of g ✓ horizontal asymptote (ca from 6.1.1) ✓ x-intercept <p>h:</p> ✓ x and y-intercept (4)
6.3	$f(x) = -\left(\frac{3}{x} + 1\right) + 5$ $f(x) = -\frac{3}{x} + 4$ <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">Answer only: 3/3 marks</div> <p>The equations of the asymptotes are: $x = 0$ $y = 4$</p>	✓ equation of f vergelyking van f ✓ $x = 0$ ✓ $y = 4$ (3)
		[12]



QUESTION/VRAAG 7		
7.1	Total amount paid /Totale bedrag betaal =R 229 ×24 =R 5 496	✓ answer/antwoord (1)
7.2	$A = P(1 + i.n)$ $5\,496 = P(1 + 0,075 \times 2)$ $P = R\,4\,779,13$	✓ $n = 2$ ✓ correct subst. into correct formula/verv. (2)
7.3	Interest/Rente = R 5 496 – R 4 779,13 = R 716,87	✓ answer/antwoord (1)
7.4	Insurance/Versekering $= \frac{R4779,13 \times 0,115}{12}$ = R45,80 New monthly payments/Nuwe maandelikse paaieiment = R45,80 + R229 = R274,80 OR/OF Total insurance = $4779,13 \times 0,115 \times 2$ = R1 099,20 Total cost = 5 496 + 1099,20 = R 6595,20 Total monthly payment $= \frac{6595,20}{24}$ = R 274,80 OR/OF Total insurance = $4779,13 \times 0,115 \times 2$ = R1 099,20 Total insurance per month $= \frac{1099,20}{24}$ = 45,80 Total monthly payment = R 229 + R45,80 = R274,80	✓ $4779,13 \times 0,115$ ✓ dividing by 12/ deling deur 12 ✓ answer/antwoord (3) ✓ $4779,13 \times 0,115 \times 2$ ✓ total cost ✓ answer (3) ✓ $4779,13 \times 0,115 \times 2$ ✓ insurance per month ✓ answer (3)



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<p>7.5</p>	$A = P(1+i)^n$ $5100 = 4779,13(1+i)^2$ $i = \sqrt{1,067139835} - 1$ $i = 0,03302460526$ <p>Inflation rate/<i>Inflasiekoers</i> = 3,30%</p>	<p>✓ formula/<i>formule</i> ✓ correct subst. of A and P/<i>verv.</i></p> <p>✓ simplification/<i>vereenvoudiging</i></p> <p>✓ answer/<i>antwoord</i> (4)</p>
		[11]

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QUESTION/VRAAG 8		
<p>8.1.1 (a)</p>	$P(B) = 1 - P(B')$ $= 1 - \frac{3}{8}$ $= \frac{5}{8}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Answer only: 2/2 marks </div>	<p>✓ formula</p> <p>✓ answer/<i>antwoord</i> (2)</p>
<p>8.1.1(b)</p>	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ $\frac{5}{7} = \frac{2}{5} + \frac{5}{8} - P(A \text{ and } B)$ $P(A \text{ and } B) = \frac{87}{280}$ $= 0,31$	<p>✓ identity</p> <p>✓ subst./<i>verv.</i></p> <p>✓ answer/<i>antwoord</i> (3)</p>
<p>8.1.2</p>	<p>Not mutually exclusive events. $P(A \text{ and } B) \neq 0$</p>	<p>✓ NOT/<i>NIE</i> ✓ reason/<i>rede</i> (2)</p>
<p>8.2.1</p>	<p>$P(A \cap B)$ OR/OF $P(A \text{ and } B)$</p>	<p>✓ answer/<i>antwoord</i> (1) ✓ answer/<i>antwoord</i> (1)</p>
<p>8.2.2</p>	<p>$P(A \cup B)'$ OR/OF $P(A \text{ or } B)'$ OR/OF $1 - P(A \text{ or } B)$</p>	<p>✓ answer/<i>antwoord</i> (1) ✓ answer/<i>antwoord</i> (1) ✓ answer/<i>antwoord</i> (1)</p>
<p>8.2.3</p>	<p>$P(A \text{ or } B) - P(A \text{ and } B)$ OR/OF $P(\text{only } A) + P(\text{only } B)$</p>	<p>✓ answer/<i>antwoord</i> (1) ✓ answer/<i>antwoord</i> (1)</p>
<p>8.3</p>	<p>8.2.3</p>	<p>✓ answer/<i>antwoord</i> (1)</p>
		[11]
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