



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT**

GRADE/GRAAD 10

MATHEMATICS P1/WISKUNDE VI

NOVEMBER 2016

MEMORANDUM

MARKS/PUNTE: 100

**This memorandum consists of 10 pages.
*Hierdie memorandum 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 memorandum.
- 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 memorandum van toepassing.
- Dit is onaanvaarbaar om waardes/antwoorde te veronderstel om 'n probleem op te los.

QUESTION 1/VRAAG 1		
1.1.1	$x^2 - x$ $= x(x - 1)$	✓ answer/antwoord (1)
1.1.2	$3x^2 + 3px - 2mx - 2mp$ $= 3x(x + p) - 2m(x + p)$ $= (3x - 2m)(x + p)$ <p>OR/OF</p> $3x^2 - 2mx + 3px - 2mp$ $= x(3x - 2m) + p(3x - 2m)$ $= (3x - 2m)(x + p)$	✓ com. fact/ gemeen fak. ✓ com.brack./ gem. haak ✓ answer/antwoord (3)
1.1.3	$2p^2 - 2p - 12$ $= 2(p^2 - p - 6)$ $= 2(p - 3)(p + 2)$ <p>OR/OF</p> $2p^2 - 2p - 12$ $= (2p - 6)(p + 2)$ $= 2(p - 3)(p + 2)$	✓ com fact/ gem fak ✓ trinomial/drie ✓ answer/antwoord (3)
		✓ fact/fak ✓ com fact/ gem fak ✓ answer/antwoord (3)

1.2.1	$\frac{2^{a+1} - 2^{a-1}}{2^a}$ $= \frac{2^a(2 - 2^{-1})}{2^a}$ $= 2 - \frac{1}{2}$ $= \frac{3}{2}$	<p>✓ com fact/ gem fak</p> <p>✓ $2 - 2^{-1}$</p> <p>✓ answer/antwoord</p> <p>(3)</p>
1.2.2	$\frac{x^2 - x + 1}{x^3 + 1} \div \frac{2x}{2x + 2}$ $= \frac{x^2 - x + 1}{(x + 1)(x^2 - x + 1)} \times \frac{2(x + 1)}{2x}$ $= \frac{1}{x}$	<p>✓ fact.of cube/fak van vierkant</p> <p>✓ tip and times/inv. en maal</p> <p>✓ fact./fak</p> <p>✓ answer/antwoord</p> <p>(4)</p> <p>[14]</p>

QUESTION 2/VRAAG 2

2.1.1	$x(x - 1) = 20$ $x^2 - x - 20 = 0$ $(x - 5)(x + 4) = 0$ $x = 5 \text{ or/of } x = -4$	<p>✓ simpl/simpl</p> <p>✓ stand. form/stand. vorm</p> <p>✓ fact/fak</p> <p>✓ answer/antwoord</p> <p>(4)</p>
2.1.2	$\frac{3x - 2}{2} = (x + 1)$ $3x - 2 = 2x + 2$ $x = 4$ <p>OR/OF</p> $\frac{3x - 2}{2} - (x + 1) = 0$ $\frac{3x - 2 - 2(x + 1)}{2} = 0$ $\frac{3x - 2 - 2x - 2}{2} = 0$ $\frac{x - 4}{2} = 0$ $x = 4$	<p>✓ multipl./maal</p> <p>✓ simpl/simpl.</p> <p>✓ answer/antwoord</p> <p>(3)</p> <p>✓ multipl./maal</p> <p>✓ simpl/simpl.</p> <p>✓ answer/antwoord</p> <p>(3)</p>

2.2.1	$-4 \leq -\frac{1}{2}m < 5$ $-8 \leq -m < 10$ $8 \geq m > -10$ $-10 < m \leq 8$ <p>OR/OF</p> $-4 \leq -\frac{1}{2}m \text{ and / en } -\frac{1}{2}m < 5$ $-8 \leq -m \text{ and / en } -m < 10$ $-10 < m \leq 8$	<p>✓ multipl/maal by 2 ✓ m – values/waardes ✓ corr.notat/korr. not.</p> <p>(3)</p> <p>✓ multipl/maal by 2 ✓ m – values/waardes ✓ corr notat./korr. not</p> <p>(3)</p>
2.2.2	$(-10 ; 8]$	<p>✓ ans/ant</p> <p>(1)</p>
2.3.1	<p>Given/Gegee</p> $4x^2 - y^2 = 171$ $2x - y = 9$ $(2x - y)(2x + y) = 171$ $9(2x + y) = 171$ $2x + y = 19$	<p>✓ fact/fak</p> <p>✓ ans/ant</p> <p>(2)</p>
2.3.2	$2x - y = 9$ $2x + y = 19$ $4x = 28$ $x = 7$ $y = 5$ <p>OR/OF</p> $2x - y = 9$ $y = 2x - 9$ $2x + y = 19$ $2x - (2x - 9) = 19$ $4x = 28$ $x = 7$ $y = 5$	<p>✓ method/methode</p> <p>✓ x -value/waarde ✓ y -value/waarde</p> <p>(3)</p> <p>✓ method/methode</p> <p>✓ x -value/waarde ✓ y -value/waarde</p> <p>(3)</p> <p>[16]</p>

QUESTION 3/VRAAG 3		
3.1	9	✓ ans/ant (1)
3.2	25	✓ ans/ant (1)
3.3	$D_n = 2n - 1$	✓✓ ans/ant (2)
3.4	$L_n = (n - 1)^2$	✓✓ ans/ant (2)
3.5	$L_n = (n - 1)^2$ $(n - 1)^2 = 64$ $n^2 - 2n + 1 = 64$ $n^2 - 2n - 63 = 0$ $(n - 9)(n + 7) = 0$ $n = 9$ or/ of $n = -7$ n/a	✓ equating/vergelijk ✓ factors/faktore ✓ ans/ant (3)
3.6	Number of dark tiles/ <i>Getal donker teëls</i> $= 1 + 3 + 5 + \dots + 199$ $= 10\,000$ Total area covered/ <i>Total oppervlakte gedek</i> $= 10\,000(0,3 \times 0,6)$ $= 1800\,m^2$	✓✓ 10 000 dark tiles/ <i>donker teëls</i> ✓ ans/ant (3) [12]

QUESTION 4/VRAAG 4		
4.1.1	<p>The cash deposit/<i>Kontantdeposito</i> $= 0,15 \times R15550$ $= R 2332,50$</p> <p>The value of loan/<i>Waarde van lening</i> $= R15550 - R2332,50$ $= R13217,50$</p>	<p>✓ deposit/<i>deposito</i></p> <p>✓ ans/<i>ant</i></p> <p>(2)</p>
4.1.2	$A = P(1 + i.n)$ $= 13217,50 \left(1 + 0,1625 \times \frac{54}{12} \right)$ $= R22882,80$	<p>✓ $A = P(1 + i.n)$</p> <p>✓ correct sub into correct formula/<i>vervang in korrek formule.</i></p> <p>✓ ans/<i>ant</i></p> <p>(3)</p>
4.1.3	<p>Annual Insurance premium/<i>Per jaar versekeringspremie</i> $= 0,015 \times 15550$ $= R 233,25$ per annum/per jaar</p> <p>Monthly payments/<i>Maandelikse paaieiment</i> $= \frac{22882,80}{54} + \frac{233,25}{12}$ $= R 443,19$</p>	<p>✓ instalment per Month/<i>paaieiment per maand</i></p> <p>✓ insurance/<i>versekering</i></p> <p>✓ ans/<i>ant</i></p> <p>(3)</p>
4.2.1	$\$1 = R 13,45$ $\$x = R 4800$ $\$x = \frac{4800}{13,45}$ $= \$356,88$	<p>✓ $\frac{4800}{13,45}$</p> <p>✓ answer</p> <p>(2)</p>
4.2.2	$\$1 = R 13,45$ $\$85 = R 1143,25$ $1\text{£} = 21,41$ $\text{£}x = R1143,25$ $x\text{£} = \frac{1143,25}{21,41}$ $= \text{£} 53,40$	<p>✓ 1 143.25</p> <p>✓ 1£ = 21,41</p> <p>✓ ans/<i>ant</i></p> <p>(3)</p>

4.3	$A = P(1+i)^n$ $2P = P(1+i)^5$ $2 = (1+i)^5$ $\sqrt[5]{2} = 1+i$ $i = \sqrt[5]{2} - 1$ $i = 0,148698 \times 100$ $r = 14,87\% \text{ p.a/per jaar}$	$\checkmark A = P(1+i)^n$ $\checkmark 2P = P(1+i)^5$ $\checkmark r = 14,87\% \text{ p.a /pj}$	(3) [16]
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QUESTION 5/ VRAAG 5

5.1	$C(0 ; -4)$	$\checkmark \text{ ans/ant}$	(1)
5.2	$D(0 ; 2)$	$\checkmark \text{ ans/ant}$	(1)
5.3	$CD = 2 - (-4)$ $CD = 6 \text{ units/eenhede}$	$\checkmark \text{ ans/ant}$	(1)
5.4	$x^2 - 4 = 0$ $(x-2)(x+2) = 0$ $x = 2 \quad x = -2$ $B(-2 ; 0)$	$\checkmark y = 0$ $\checkmark \text{ factors/faktore}$ $\checkmark \text{ ans/ant}$	(3)
5.5	$x^2 - 4 = -x + 2$ $x^2 + x - 6 = 0$ $(x-2)(x+3) = 0$ $x = 2 \quad x = -3$ $E(-3 ; 5)$	$\checkmark \text{ equating/vergelijk}$ $\checkmark \text{ factors/faktore}$ $\checkmark x\text{-answer/antwoord}$ $\checkmark y\text{-answer/antwoord}$	(4)
5.6.1	$-3 < x < 2$ OR/OF $(-3 ; 2)$	$\checkmark \text{ values/waardes}$ $\checkmark \text{ notation/notasie}$	(2)
5.6.2	$(-\infty ; -2] \cup \{2\}$	$\checkmark (-\infty ; -2]$ $\checkmark 2$	(2)
5.7	$K(-2 ; 4)$ $BK = 4 \text{ units/eenhede}$ $AB = 4 \text{ units/eenhede}$ $AK = \sqrt{4^2 + 4^2} \text{ (Pythagoras)}$ $= 5,66 \text{ units/eenhede}$	$\checkmark BK$ $\checkmark AB$ $\checkmark \text{ method/methode}$ $\checkmark \text{ answer/antwoord}$	(4)
			[18]

QUESTION 6/VRAAG 6		
6.1	$y < 8$	✓ answer/antwoord (1)
6.2	$-2^x + 8 = 0$ $2^x = 8$ $2^x = 2^3$ $x = 3$ B(3 ; 0)	✓ equating to 0/vergeelyk met 0 ✓ simpli/vereenv. ✓ answer/antwoord (3)
6.3	$h(x) = 2^x - 8$	✓✓ answer/antwoord (2)
6.4	<p>The graph of g was reflected over the x-axis to form h. This means when $y = 0$, the solution will be the same for both functions. This means that both g and h will have an x-intercept at B.</p> <p><i>Grafiek g oor die x-as gereflekteer om h te vorm. As $y = 0$, sal die oplossing dieselfde wees vir albei funksies. Beide g en h sal 'n x-afsnit by B hê.</i></p>	✓ reflection over x -axis/reflek oor x -as ✓ explanation/verduideliking (2) [8]

QUESTION 7/VRAAG 7		
	$h(x) = \frac{a}{x} + 3$ $0 = \frac{a}{2} + 3$ $a = -6$ $h(x) = \frac{-6}{x} + 3$	✓ +3 ✓ subs of (2 ; 0)/sub van (2 ; 0) ✓ answer for a / antwoord van a ✓ answer/antwoord (4) [4]

QUESTION 8/VRAAG 8		
8.1.1	$27 - x + x + 32 - x + 7 = 42$ $-x = 42 - 66$ $x = 24$	✓ equation/vergelyking ✓ answer/antwoord (2)
8.1.2 (a)	P(does not play hockey or soccer/speel nie hokkie of sokker) $= \frac{7}{42}$ $= \frac{1}{6}$	✓ answer/antwoord (1)
8.1.2 (b)	P(soccer only/slegs sokker) $= \frac{8}{42}$ $= \frac{4}{21}$ <p>OR/OF P(soccer only/slegs sokker) $= 1 - \left(\frac{3 + 24 + 7}{42} \right)$ $= \frac{8}{42}$ $= \frac{4}{21}$</p>	✓ ✓ answer/antwoord (2) ✓ ✓ answer/antwoord (2)
8.2.1	$x + 3$	✓ answer/antwoord (1)
8.2.2	$P(\text{blue/blou}) = \frac{3}{x+3}$	✓ ✓ ans/antwoord (2)
8.3.1	$P(A \text{ and/en } B) = 0$	✓ answer/answer (1)
8.3.2	$P(B) = 1 - P(B')$ $= 1 - 0,7$ $= 0,3$ $P(A \text{ or/of } B) = P(A) + P(B)$ $= 0,55 + 0,3$ $= 0,85$	✓ $P(B) = 0.3$ ✓ subst./vervang ✓ answer/antwoord (3) [12]

TOTAL/TOTAAL: 100