



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

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X696, PRETORIA 0001
2016 -11- 07
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

**This memorandum consists of 11 pages.
Hierdie memorandum bestaan uit 11 bladsye.**

M.S.

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	$3x^2 + 3px - 2mx - 2mp$ $= 3x(x + p) - 2m(x + p)$ $= (3x - 2m)(x + p)$ OR/OF $3x^2 - 2mx + 3px - 2mp$ $= x(3x - 2m) + p(3x - 2m)$ $= (3x - 2m)(x + p)$	✓ $3x(x + p)$ ✓ $-2m(x + p)$ ✓ answer/antwoord (3) ✓ $x(3x - 2m)$ ✓ $p(3x - 2m)$ ✓ answer/antwoord (3)
1.1.3	$2p^2 - 2p - 12$ $= 2(p^2 - p - 6)$ $= 2(p - 3)(p + 2)$ OR/OF $2p^2 - 2p - 12$ $= (2p - 6)(p + 2)$ $= 2(p - 3)(p + 2)$	✓ taking out com. fact correctly/korrek gem. faktors ✓✓ answer/antwoord (3) ✓✓ factors/gem. faktors ✓ answer/antwoord (3) CA apply for maximum of 2 marks DA-maksimum van 2 punte Answer ONLY full marks Antwoord ALLEENLIK-vol punte

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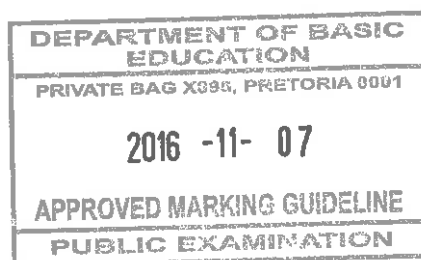
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1.2.1	$\frac{2^{a+1} - 2^{a-1}}{2^a}$ $= \frac{2^a(2 - 2^{-1})}{2^a}$ $= 2 - \frac{1}{2}$ $= \frac{3}{2}$	<p>✓ com. fact/gem. fak ✓ $(2 - 2^{-1})$</p> <p>✓ answer/antwoord</p>
1.2.2	$\frac{x^2 - x + 1}{x^3 + 1} \div \frac{2x}{2x + 2}$ $= \frac{x^2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

(3)

(4)

[14]




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QUESTION 2/VRAAG 2

2.1.1

$$x(x - 1) = 20$$

$$x^2 - x - 20 = 0$$

$$(x - 5)(x + 4) = 0$$

$$x = 5 \text{ or/of } x = -4$$

- ✓ removing brackets/*verw. hakkies*
- ✓ stand.form/*stand. vorm*
- ✓ fact/*fak*
- ✓ answer/*antwoord*

(4)

2.1.2

$$\frac{3x - 2}{2} = (x + 1)$$

$$3x - 2 = 2(x + 1)$$

$$3x - 2 = 2x + 2$$

$$x = 4$$

OR/OF

$$\frac{3x - 2}{2} - (x + 1) = 0$$

$$\frac{3x - 2 - 2(x + 1)}{2} = 0$$

$$\frac{3x - 2 - 2x - 2}{2} = 0$$

$$\frac{x - 4}{2} = 0$$

$$x = 4$$

OR/OF

$$\frac{3x}{2} - 1 = x + 1$$

$$\frac{3x}{2} - x = 2$$

$$\frac{x}{2} = 2$$

$$x = 4$$

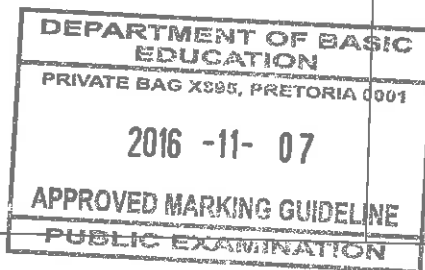
- ✓ multipl./*maal*
- ✓ simpl/*simpl.*
- ✓ answer/*antwoord*

(3)

- ✓ writing the LHS as a single fraction./ *skryf LK as n enkel breuk*
- ✓ simplification/ *simpl.*

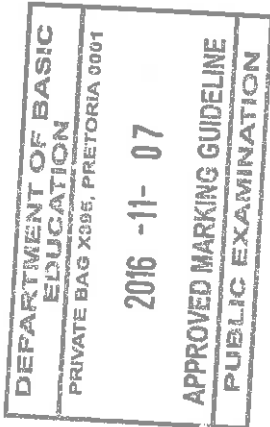
- ✓ answer/*antwoord*

(3)



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<p>2.2.1</p>	$-4 \leq -\frac{1}{2}m < 5$ $-8 \leq -m < 10$ $8 \geq m > -10$ $-10 < m \leq 8$ <p>OR/OF</p> $-4 \leq -\frac{1}{2}m \text{ and / en } -\frac{1}{2}m < 5$ $-8 \leq -m \text{ and / en } -m < 10$ $-10 < m \leq 8$	<ul style="list-style-type: none"> ✓ multipl/maal by 2 ✓ critical values/krit. waarde ✓ corr.notat/korr. not. <p style="text-align: right;">(3)</p> <ul style="list-style-type: none"> ✓ multipl/maal by 2 ✓ m – values/waardes ✓ corr notat./korr. not <p style="text-align: right;">(3)</p>
<p>2.2.2</p>	<p>$(-10 ; 8]$</p>	<ul style="list-style-type: none"> ✓ ans/ant <p style="text-align: right;">(1)</p>
<p>2.3.1</p>	<p>Given/Gegee</p> $4x^2 - y^2 = 171$ $2x - y = 9$ $(2x - y)(2x + y) = 171$ $9(2x + y) = 171$ $2x + y = 19$	<ul style="list-style-type: none"> ✓ factors/fak ✓ answer/ant <p style="text-align: right;">(2)</p>
<p>2.3.2</p>	$2x - y = 9$ $2x + y = 19$ $4x = 28$ $x = 7$ $y = 5$ <p>OR/OF</p> $2x - y = 9$ $y = 2x - 9$ $2x + y = 19$ $2x - (2x - 9) = 19$ $4x = 28$ $x = 7$ $y = 5$	<ul style="list-style-type: none"> ✓ method/methode ✓ x -value/waarde ✓ y - value/waarde <p style="text-align: right;">(3)</p> <ul style="list-style-type: none"> ✓ method/methode ✓ x -value/waarde ✓ y - value/waarde <p style="text-align: right;">(3)</p>



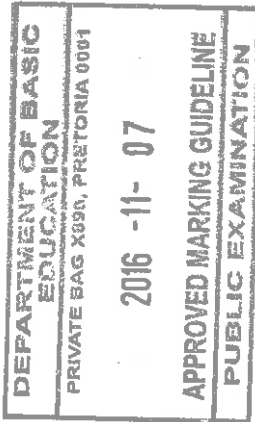
QUESTION 3/VRAAG 3		
3.1	9	✓ ans/ant (1)
3.2	25	✓ ans/ant (1)
3.3	$D_n = 2n - 1$	✓ 2n ✓ -2 (2)
3.4	$L_n = (n - 1)^2$	✓✓ ans/ant (2)
3.5	$L_n = (n - 1)^2$ $(n - 1)^2 = 64$ $n^2 - 2n + 1 = 64$ $n^2 - 2n - 63 = 0$ $(n - 9)(n + 7) = 0$ $n = 9$ or/ of $n = -7$ n/a	✓ equating/ vergelyk $L_n = 64$ ✓ factors/faktore ✓ answer/antwoord (3)
3.6	Number of dark tiles/ <i>Getal donker teëls</i> $= 1 + 3 + 5 + \dots + 99 + 101 + \dots + 195 + 197 + 199$ $= 50(200) = 10\ 000$ Total area covered/ <i>Totale 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]

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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>OR/ OF</p> <p>The value of loan/<i>Waarde van lening</i> $= 85\% \text{ of } 15550$ $= R13217,50$</p>	<p>✓ deposit/<i>deposito</i></p> <p>✓ ans/<i>ant</i> (2)</p> <p>✓ 85% of loan/<i>85% van lening</i> ✓ ans/<i>ant</i> (2)</p>
4.1.2	<p>$A = P(1 + i.n)$ $= 13217,50 \left(1 + 0,1625 \times \frac{54}{12} \right)$ $= R22 882,80$</p> <p>OR/ OF</p> <p>$SI = Pi.n$ $= 13217,50(0,1625)(4,5)$ $= R9665,30$</p> <p>$A = SI + P$ $= R9665,30 + R13217,50$ $= R22 882,80$</p>	<p>✓ $A = P(1 + i.n)$ ✓ correct sub into correct formula/<i>vervang in korrek formule.</i> ✓ ans/<i>ant</i> (3)</p> <p>✓ $SI = R9665,30.$ ✓ $A = Pin + P$ ✓ ans/<i>ant</i> (3)</p>
4.1.3	<p>Annual Insurance premium/<i>Per jaar versekeringspremie</i> $= 0,015 \times 15 550$ $= R 233,25 \text{ per annum/per jaar}$</p> <p>Monthly payments/ <i>Maandelikse paaieiment</i> $= \frac{22882,80}{54} + \frac{233,25}{12}$ $= R 443,19$</p> <p>OR/ OF</p> <p>$AIP = 233,25 \times 4,5$ $= R1049,63$</p> <p>Monthly payments/ <i>Maandelikse paaieiment</i> $= \frac{22882,80 + 1049,63}{54}$ $= R 443,19$</p>	<p>✓ instalment per Month/<i>paaieiment per maand</i> ✓ insurance per month/<i>versekering per maand</i> ✓ ans/<i>ant</i> (3)</p> <p>✓ insurance for/<i>versekering vir</i> 4,5 years/<i>jaar</i> ✓ Instalment per month /<i>paaieiment per maand</i> ✓ ans/<i>ant</i> (3)</p>

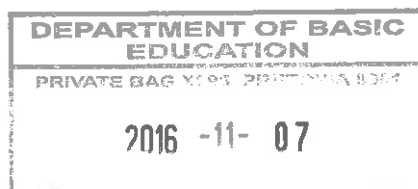


<p>4.2.1</p>	$\begin{aligned} \$1 &= R\ 13,45 \\ \$x &= R\ 4\ 800 \\ \$x &= \frac{4800}{13,45} \\ &= \$356,88 \end{aligned}$	<p>✓ division by/ <i>deel deur</i> 13,45 ✓ answer/ <i>antwoord</i></p> <p>(2)</p>
<p>4.2.2</p>	$\begin{aligned} \$1 &= R\ 13,45 \\ \$85 &= R\ 1\ 143,25 \\ 1\text{£} &= 21,41 \\ 1\text{£} &= R\ 1\ 143,25 \\ x\text{£} &= \frac{1\ 143,25}{21,41} \\ &= \text{£}\ 53,40 \end{aligned}$ <p>OR/ OF</p> $\begin{aligned} x\text{£} &= \frac{13,45}{21,41} \times 85 \\ &= \text{£}\ 53,40 \end{aligned}$ <p>OR/ OF</p> $\begin{aligned} x\text{£} &= \frac{21,41}{13,45} \times 85 \\ &= \text{£}\ 53,40 \end{aligned}$	<p>✓ 1143.25 ✓ 1£ = 21,41</p> <p>✓ ans/ant</p> <p>(3)</p> <p>✓ $\frac{13,45}{21,41} \times 85$ ✓ ans/ant</p> <p>(3)</p> <p>✓ $\frac{21,41}{13,45} \times 85$ ✓ ans/ant</p> <p>(3)</p>
<p>4.3</p>	$\begin{aligned} A &= P(1+i)^n \\ 2P &= P(1+i)^5 \\ 2 &= (1+i)^5 \\ \sqrt[5]{2} &= 1+i \\ i &= \sqrt[5]{2} - 1 \\ i &= 0,148698 \times 100 \\ r &= 14,87\% \text{ p.a/per jaar} \end{aligned}$	<p>✓ $2P = P(1+i)^5$</p> <p>✓ $\sqrt[5]{2} = 1+i$</p> <p>✓ $r = 14,87\% \text{ p.a /pj}$</p> <p>(3)</p> <p>[16]</p>

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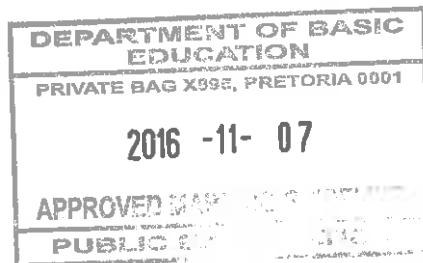
QUESTION 5/ VRAAG 5		
5.1	C(0 ; -4)	✓ ans/ant (1)
5.2	D(0 ; 2)	✓ ans/ant (1)
5.3	CD = 2 - (-4) CD = 6 units/eenhede	✓ ans/ant (1)
5.4	$x^2 - 4 = 0$ $(x - 2)(x + 2) = 0$ $x = 2 \quad x = -2$ B(-2 ; 0)	✓ $y = 0$ ✓ factors/faktore ✓ ans/ant (3)
5.5	$x^2 - 4 = -x + 2$ $x^2 + x - 6 = 0$ $(x - 2)(x + 3) = 0$ $x = 2 \quad x = -3$ E(-3 ; 5)	✓ $f(x) = g(x)$: equating/vergelyk ✓ factors/faktore ✓ x-answer/antwoord ✓ y-answer/antwoord (4)
5.6.1	$-3 < x < 2$ OR/OF (-3 ; 2)	✓ values/waardes ✓ notation/notasie (2)
5.6.2	$x \leq -2$ or $x = 2$ OR/OF $(-\infty ; -2] \cup \{2\}$	✓ $x \leq -2$ ✓ 2 ✓ $(-\infty ; -2]$ ✓ 2 (2)
5.7	K(-2 ; 4) BK = 4 units/eenhede AB = 4 units/eenhede $AK = \sqrt{4^2 + 4^2}$ (Pythagoras) = 5,66 or $\sqrt{32}$ or $4\sqrt{2}$ units/eenhede	✓ BK ✓ AB ✓ method/methode ✓ answer/antwoord (4)
		[18]



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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/vergelyk met 0 ✓ simpli/vereenv. ✓ x-answer/antwoord (3)
6.3	$h(x) = 2^x - 8$	✓✓ answer/antwoord (2)
6.4	Reflecting the graph of g over the x -axis only changes the sign of the y -values. This means that both g and h will have the same x -intercept at B. 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.	✓ 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 ✓ subst. of/ sub van (2 ; 0) ✓ value of a / waarde van a ✓ answer/antwoord (4) [4]



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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) $= \frac{7}{42}$ OR/OF $= \frac{1}{6}$	✓ answer/antwoord (1)
8.1.2 (b)	P(soccer only/slegs sokker) $= \frac{8}{42}$ OR $= \frac{4}{21}$ OR/OF P(soccer only/slegs sokker) $= 1 - \left(\frac{3 + 24 + 7}{42} \right)$ $= \frac{8}{42}$ $= \frac{4}{21}$	✓✓ answer/antwoord (2) ✓✓ answer/antwoord (2)
8.2.1	$x + 3$	✓ answer/antwoord (1)
8.2.2	$P(\text{blue/blou}) = \frac{3}{x+3}$	✓✓ answer/antwoord (2)
8.3.1	$P(A \text{ and/en } B) = 0$	✓ answer/antwoord (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 M.S (3)
TOTAL/TOTAAL: 100		
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