



# 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	$3x^2 + 3px - 2mx - 2mp$ $= 3x(x + p) - 2m(x + p)$ $= (3x - 2m)(x + p)$  <b>OR/OF</b>  $3x^2 - 2mx + 3px - 2mp$ $= x(3x - 2m) + p(3x - 2m)$ $= (3x - 2m)(x + p)$	✓ $3x(x + p)$ ✓ $-2m(x + p)$ ✓ answer/antwoord (3)  ✓ $x(3x - 2m)$ ✓ $p(3x - 2m)$ ✓ answer/antwoord (3)
1.1.3	$2p^2 - 2p - 12$ $= 2(p^2 - p - 6)$ $= 2(p - 3)(p + 2)$  <b>OR/OF</b>  $2p^2 - 2p - 12$ $= (2p - 6)(p + 2)$ $= 2(p - 3)(p + 2)$	✓ 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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<p>1.2.1</p>	$\frac{2^{a+1} - 2^{a-1}}{2^a}$ $= \frac{2^a(2 - 2^{-1})}{2^a}$ $= 2 - \frac{1}{2}$ $= \frac{3}{2}$	<p>✓ com. fact/gem. fak                  ✓ <math>(2 - 2^{-1})</math></p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(3)</p>
<p>1.2.2</p>	$\frac{x^2 - x + 1}{x^3 + 1} \div \frac{2x}{2x + 2}$ $= \frac{x^2 - x + 1}{(x + 1)(x^2 - x + 1)} \times \frac{2(x + 1)}{2x}$ $= \frac{1}{x}$	<p>✓ fact.of cube/fak van vierkant                  ✓ invert and multiply /inv. en maal                  ✓ factorise/ fak. <math>2(x + 1)</math></p> <p>✓ answer/antwoord</p> <p style="text-align: right;">(4)                  [14]</p>

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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**

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

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

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

$$x = 4$$

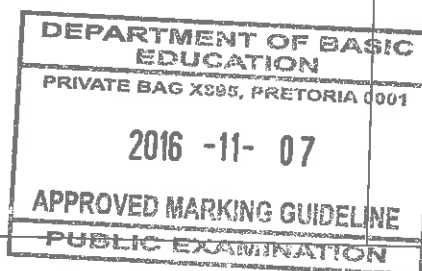
- ✓ multipl./*maal*
- ✓ simpl/*simpl.*
- ✓ answer/*antwoord*

(3)

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

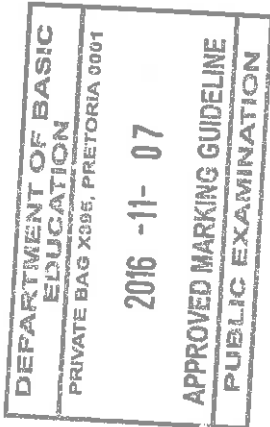
- ✓ answer/*antwoord*

(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><b>OR/OF</b></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                  ✓ critical values/krit. waarde                  ✓ corr.notat/korr. not.</p> <p>(3)</p> <p>✓ multipl/maal by 2                  ✓ m – values/waardes                  ✓ corr notat./korr. not</p> <p>(3)</p>
<p>2.2.2</p>	<p><math>(-10 ; 8]</math></p>	<p>✓ ans/ant</p> <p>(1)</p>
<p>2.3.1</p>	<p>Given/Gegee</p> $4x^2 - y^2 = 171$ $2x - y = 9$ $(2x - y)(2x + y) = 171$ $9(2x + y) = 171$ $2x + y = 19$	<p>✓ factors/fak</p> <p>✓ answer/ant</p> <p>(2)</p>
<p>2.3.2</p>	$2x - y = 9$ $2x + y = 19$ $4x = 28$ $x = 7$ $y = 5$ <p><b>OR/OF</b></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>



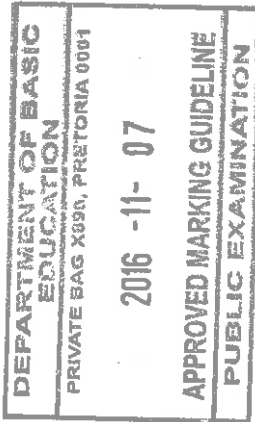
QUESTION 3/VRAAG 3		
3.1	9	✓ ans/ant (1)
3.2	25	✓ ans/ant (1)
3.3	$D_n = 2n - 1$	✓ 2n ✓ -2 (2)
3.4	$L_n = (n - 1)^2$	✓✓ ans/ant (2)
3.5	$L_n = (n - 1)^2$ $(n - 1)^2 = 64$ $n^2 - 2n + 1 = 64$ $n^2 - 2n - 63 = 0$ $(n - 9)(n + 7) = 0$ $n = 9$ or/ of $n = -7$ n/a	✓ equating/ vergelyk $L_n = 64$  ✓ factors/faktore ✓ 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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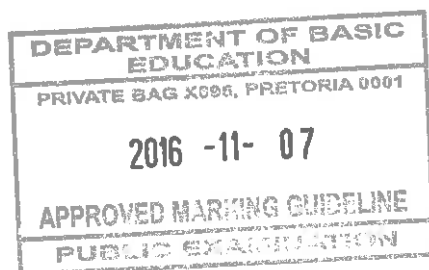
**QUESTION 4/VRAAG 4**


4.1.1	<p>The cash deposit/<i>Kontantdeposito</i>  <math>= 0,15 \times R15550</math>  <math>= R 2332,50</math></p> <p>The value of loan/<i>Waarde van lening</i>  <math>= R15550 - R2332,50</math>  <math>= R13217,50</math></p> <p><b>OR/ OF</b></p> <p>The value of loan/<i>Waarde van lening</i>  <math>= 85\% \text{ of } 15550</math>  <math>= R13217,50</math></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><math>A = P(1 + i.n)</math>  <math>= 13217,50 \left( 1 + 0,1625 \times \frac{54}{12} \right)</math>  <math>= R22 882,80</math></p> <p><b>OR/ OF</b></p> <p><math>SI = Pi.n</math>  <math>= 13217,50(0,1625)(4,5)</math>  <math>= R9665,30</math></p> <p><math>A = SI + P</math>  <math>= R9665,30 + R13217,50</math>  <math>= R22 882,80</math></p>	<p>✓ <math>A = P(1 + i.n)</math>                  ✓ correct sub into correct formula/<i>vervang in korrek formule.</i>                  ✓ ans/<i>ant</i> (3)</p> <p>✓ <math>SI = R9665,30.</math>                  ✓ <math>A = Pin + P</math>                  ✓ ans/<i>ant</i> (3)</p>
4.1.3	<p>Annual Insurance premium/<i>Per jaar versekeringspremie</i>  <math>= 0,015 \times 15 550</math>  <math>= R 233,25 \text{ per annum/per jaar}</math></p> <p>Monthly payments/ <i>Maandelikse paaieiment</i>  <math>= \frac{22882,80}{54} + \frac{233,25}{12}</math>  <math>= R 443,19</math></p> <p><b>OR/ OF</b></p> <p><math>AIP = 233,25 \times 4,5</math>  <math>= R1049,63</math></p> <p>Monthly payments/ <i>Maandelikse paaieiment</i>  <math>= \frac{22882,80 + 1049,63}{54}</math>  <math>= R 443,19</math></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>



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

[16]

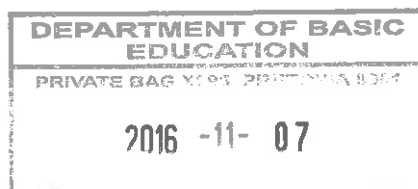


  
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Please turn over/ *Blaai om asseblief*



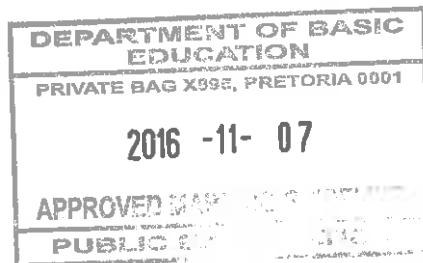
QUESTION 5/ VRAAG 5		
5.1	C(0 ; -4)	✓ ans/ant (1)
5.2	D(0 ; 2)	✓ ans/ant (1)
5.3	CD = 2 - (-4) CD = 6 units/eenhede	✓ ans/ant (1)
5.4	$x^2 - 4 = 0$ $(x - 2)(x + 2) = 0$ $x = 2 \quad x = -2$ B(-2 ; 0)	✓ $y = 0$ ✓ factors/faktore ✓ ans/ant (3)
5.5	$x^2 - 4 = -x + 2$ $x^2 + x - 6 = 0$ $(x - 2)(x + 3) = 0$ $x = 2 \quad x = -3$ E(-3 ; 5)	✓ $f(x) = g(x)$ : equating/vergelyk ✓ factors/faktore ✓ x-answer/antwoord ✓ y-answer/antwoord (4)
5.6.1	$-3 < x < 2$ <b>OR/OF</b> (-3 ; 2)	✓ values/waardes ✓ notation/notasie (2)
5.6.2	$x \leq -2$ or $x = 2$ <b>OR/OF</b> $(-\infty ; -2] \cup \{2\}$	✓ $x \leq -2$ ✓ 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]



*[Handwritten Signature]*  
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QUESTION 8/VRAAG 8		
8.1.1	$27 - x + x + 32 - x + 7 = 42$ $-x = 42 - 66$ $x = 24$	✓ equation/vergeljking  ✓ answer/antwoord  (2)
8.1.2 (a)	P(does not play hockey or soccer/speel nie hokkie of sokker) $= \frac{7}{42}$ <b>OR/OF</b> $= \frac{1}{6}$	✓ answer/antwoord  (1)
8.1.2 (b)	P(soccer only/slegs sokker) $= \frac{8}{42}$ <b>OR</b> $= \frac{4}{21}$  <b>OR/OF</b> 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)
<b>TOTAL/TOTAAL: 100</b>		
<b>[12]</b>		

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