basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE/ *NASIONALE SENIOR SERTIFIKAAT*

GRADE/*GRAAD* 10

MATHEMATICS P1/*WISKUNDE V1*

NOVEMBER 2016

MEMORANDUM

MARKS/*PUNTE*: 100

DEPARTMENT OF BASIC EDUCATION
PRIVATE BAG X895, PRETORIA 0001
2016 -11- 07
APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

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

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

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QUESTION 2/*VRAAG 2*		
2.1.1	$x(x-1)=20$ $x^2-x-20=0$ $(x-5)(x+4)=0$ $x=5$ or/of $x=-4$	✓removing brackets/*verw.hakkies* ✓stand.form/*stand. vorm* ✓fact/*fak* ✓answer/*antwoord* (4)
2.1.2	$\frac{3x-2}{2}=(x+1)$ $3x-2=2(x+1)$ $3x-2=2x+2$ $x=4$	✓ multipl./*maal* ✓ simpl/*simp.* ✓answer/*ant*woord (3)
	OR/*OF* $\frac{3x-2}{2}-(x+1)=0$ $\frac{3x-2-2(x+1)}{2}=0$ $\frac{3x-2-2x-2}{2}=0$ $\frac{x-4}{2}=0$ $x=4$	✓ writing the LHS as a single fraction./ *skryf LK as n enkel breuk* ✓simplification/ *simpl.* ✓answer/*antwoord* (3)
	OR/*OF* $\frac{3x}{2}-1=x+1$ $\frac{3x}{2}-x=2$ $\frac{x}{2}=2$ $x=4$	

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

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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/*Getal donker teëls* $= 1 + 3 + 5 + ... + 99 + 101 + ... + 195 + 197 + 199$ $= 50(200) = 10\,000$ Total area covered/*Totale oppervlakte gedek* $= 10\,000(0{,}3 \times 0{,}6)$ $= 1800\ m^2$	✓✓10 000 dark tiles/*donker teëls* ✓ans/*ant* (3) **[12]**

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QUESTION 4/*VRAAG* 4

4.1.1

The cash deposit/*Kontantdeposito*
$= 0{,}15 \times R15550$
$= R\,2332{,}50$

✓deposit/*deposito*

The value of loan/*Waarde van lening*
$= R15550 - R2332{,}50$
$= R13217{,}50$

✓ans/*ant*

OR/ *OF*

The value of loan/*Waarde van lening*
$= 85\%$ of 15550
$= R13217{,}50$

✓85% of loan/*85% van lening*
✓ans/*ant*

(2)

4.1.2

$A = P(1 + i.n)$

$= 13217{,}50\left(1 + 0{,}1625 \times \frac{54}{12}\right)$

$= R\,22\,882{,}80$

✓ $A = P(1+i.n)$
✓ correct sub into correct formula/*vervang in korrek formule.*
✓ans/*ant*

(3)

OR/ *OF*

$SI = Pi.n$
$= 13217{,}50(0{,}1625)(4{,}5)$
$= R9665{,}30$
$A = SI + P$
$= R9665{,}30 + R13217{,}50$
$= R\,22\,882{,}80$

✓ $SI = R9665{,}30$.

✓ $A = Pin + P$

✓ans/*ant*

(3)

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4.1.3

Annual Insurance premium/*Per jaar versekeringspremie*
$= 0{,}015 \times 15\,550$
$= R\,233{,}25$ per annum/per jaar
Monthly payments/ Maandelikse paaiement
$= \frac{22882{,}80}{54} + \frac{233{,}25}{12}$
$= R\,443{,}19$

✓ instalment per Month/*paaiement per maand*
✓ insurance per month/*versekering per maand*
✓ans/*ant*

(3)

OR/ *OF*

$AIP = 233{,}25 \times 4{,}5$
$= R1049{,}63$
Monthly payments/ Maandelikse paaiement
$= \frac{22882{,}80 + 1049{,}63}{54}$
$= R\,443{,}19$

✓ insurance for/*versekering vir* 4,5 years/ *jaar*

✓ Instalment per month /*paaiement per maand*
✓ans/*ant*

(3)

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4.2.1	\$1 = R 13,45 \$x=R4 800 $\$x = \frac{4800}{13,45}$ $= \$356,88$	✓ division by/ *deel deur* 13,45 ✓answer/ *antwoord* (2)
4.2.2	\$1=R 13,45 \$85=R 1143,25 1£=21,41 £x=R1143,25 $x£ = \frac{1143,25}{21,41}$ $= £53,40$ **OR/ *OF*** $x£ = \frac{13,45}{21,41} \times 85$ $= £53,40$ **OR/ *OF*** $x£ = \frac{21,41}{13,45} \times 85$ $= £53,40$	✓1143.25 ✓ 1£ = 21,41 ✓ans/*ant* (3) ✓ $\frac{13,45}{21,41}$ ✓ ×85 ✓ans/*ant* (3) ✓ $\frac{21,41}{13,45}$ ✓ ×85 ✓ans/*ant* (3)
4.3	$A = P(1+i)^n$ $2P = P(1+i)^5$ $2 = (1+i)^5$ $\sqrt[5]{2} = 1+i$ $i = \sqrt[5]{2} - 1$ $i = 0,148698 \times 100$ $r = 14,87\%$ p.a/per jaar	✓ $2P = P(1+i)^5$ ✓ $\sqrt[5]{2} = 1+i$ ✓ $r = 14,87\%$ p.a /*pj* (3) **[16]**

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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 and/*en* B) = 0	✓ answer/*antwoord* (1)
8.3.2	$P(B)=1-P(B')$ $=1-0,7$ $=0,3$ $P(\text{A or/of B})=P(A)+P(B)$ $=0,55+0,3$ $=0,85$	✓ $P(B)=0.3$ ✓subst./*vervang* ✓answer/*antwoord* M.S (3)
TOTAL/*TOTAAL*: 100		**[12]**

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