LIMPOPO

PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICS P1

MARKING GUIDELINES

NOVEMBER 2018

MARKS: 100

This marking guideline consists of 10 pages.

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.

QUESTION 1

1.1	$5 \qquad 128^{\frac{1}{3}} \qquad\qquad 6$	✓5 ✓6 (2)
1.2.1	$x = \{0;1;2;3;4;5\}$ $x = 4$	✓ answer / antwoord (1)
1.2.2	$x = 5$	✓ answer / antwoord (1)
1.2.3	$x = 2 \qquad x = 1$	✓✓ answers / antwoorde (2)
1.2	Let/stel $123456789 = n$ $\therefore n(n+1) - (n+2)(n-1)$ $n^2 + n - (n^2 + n - 2)$ $= n^2 + n - n^2 - n + 2$ $= 2$	✓substitution ✓simplifying ✓answer/antwoord (3)

[9]

QUESTION 2

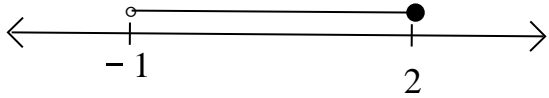| 2.1	$(x^n + y^m)(x^n + y^m)$ $= x^{2n} + 2x^n y^m + y^{2m}$	✓ x^{2n} ✓ $2x^n y^m$ ✓ y^{2m} (3)

2.2	$\left(3-\frac{1}{3}y\right)^2\left(3+\frac{1}{3}y\right)^2$	$\checkmark\left(9-\frac{1}{9}y^2\right)\left(9-\frac{1}{9}y^2\right)$
	$=\left(3-\frac{1}{3}y\right)\left(3+\frac{1}{3}y\right)\left(3-\frac{1}{3}y\right)\left(3+\frac{1}{3}y\right)$	
	$=\left(9-\frac{1}{9}y^2\right)\left(9-\frac{1}{9}y^2\right)$	$\checkmark 81$
		$\checkmark -2y^2$
	$=81-2y^2+\frac{1}{81}y^4$	$\checkmark \frac{1}{81}y^2$
		(4)
2.3	$\dfrac{x}{(x-y)\left(x^2+xy+y^2\right)}-\dfrac{1}{\left(x^2+xy+y^2\right)}$	$\checkmark$ factorisation $\left(x^2+xy+y^2\right)$
		$\checkmark$ LCM : $(x-y)\left(x^2+xy+y^2\right)$
	$=\dfrac{x-1(x-y)}{(x-y)\left(x^2+xy+y^2\right)}$	
	$=\dfrac{x-x+y}{(x-y)\left(x^2+xy+y^2\right)}$	$\checkmark$ Simplify
	$=\dfrac{y}{(x-y)\left(x^2+xy+y^2\right)}$	$\checkmark$ answer/antwoord
		(4)

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Question 3/Vraag 3

3.	$y=x-4$ in	$\checkmark$ substitute/vervang $(x-4)$
	$(x-4)+x=12$	$\checkmark$ simplifying
	$x-4+x=12$	
	$2x=16$	
	$x=8$	$\checkmark x=8$
	$in: y=x-4$	$\checkmark$ substitute/vervang $x=8$
	$=8-4$	$\checkmark y=4$
	$y=4$	
	$\therefore (8;4)$	(5)
		[5]

Question 4/ Vraag 4

4.1	$2x^{x^2-3x} = \dfrac{25}{100}$ $= \dfrac{1}{4}$ $2^{x^2-3x} = 2^{-2}$ $\therefore x^2 - 3x = -2$ $x^2 - 3x + 2 = 0$ $(x-1)(x-2) = 0$ $x - 1 = 0 \qquad x - 2 = 0$ $x = 1 \qquad\qquad x = 2$	✓base 2 both sides/ grondtal 2 beide kante ✓ standard form = 0/ Standaardvorm = 0 ✓ $x = 1$ ✓ $x = 2$ (4)
4.2	$-1 \le 3 - 2x < 5$ $-1 - 3 \le -2x < 5 - 3$ $-4 \le -2x < 2$ $\div -2 \qquad -1 < x \le 2$	✓subtract both sides/ aftrekking beide kante ✓answer/antwoord ✓inequality sign ✓answer on number line / antwoord op getallelyn (4)
4.3	$px + qx = a$ $x(p + q) = a$ $x = \dfrac{a}{p + q}$	✓factorisation/ faktoriseer ✓answer/ antwoord (2) **[10]**

Question 5/Vraag 5

5.1.1	$T_n = n - 5$ $-1 = n - 5$ $n = 4$ $T_3 = 3 - 5 = -2$ $T_5 = 5 - 5 = 0$ $\therefore -2; -1; 0; 2$ $\therefore p = -2 \quad q = 0$	$\checkmark$-2 $\checkmark$0 (2)
5.1.2	$2n^3 + 1$ $55 = 2(n)^3 + 1$ $27 = n^3$ $3 = n$ $T_2 = 2(2)^3 + 1 = 17$ $T_5 = 2(5)^3 + 1 = 251$ $\therefore k = 17 \quad m = 251$	$\checkmark$ $k = 17$ $\checkmark$ $m = 251$ (2)
5.2.1	19	$\checkmark$ answer/ antwoord (1)
5.2.2	$Tn = an + b$ $Tn = 3n + 1$	$\checkmark$formule $\checkmark$a =3 $\checkmark$b =1 (3)
5.2.3	$106 = 3n + 1$ $\dfrac{105}{3} = n$ $35 = n$	$\checkmark$equating 106 in $\checkmark$simplifying $\checkmark$answer (3)

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Vraag 6/ Question 6

6.1	$2500 \times 423.50 \times 13,58$ $= R14\ 377\ 825,00$	✓R13,58 ✓multiplication ✓answer/antwoord (3)
6.2.1	Deposit/deposito: $=15\% \times R3999$ $= R599,85$ *Total* Payments: $=\text{deposit} + 24 \times R170$ $= R599,85 + R4080$ $= R4679,85$ $I = R4679,85 - R3999$ $= R680,85$	✓Deposit/deposito ✓Total repay/Totale terugbetaling ✓answer (4)
6.2.2	$P = 3999 - 599.85$ $= R3399,15$	✓✓ R3999 -599.85 ✓answer/antwoord (3)
6.2.3	$A = R170 \times 24 = R4080$ $A = P(1 + i.n)$ $4080 = 3399,15(1 + i \times 2)$ $\dfrac{4080}{3399.15} = 1 + 2i$ $1,2003 - 1 = 2i$ $i = \dfrac{0.2003}{2}$ $i = 0,10015$ rentekoers/interest rate $=10\%$	✓formula/formule ✓correct substitution in correct formula ✓simplification/vereenvoudiging ✓10% answer/antwoord (4) **[14]**

Vraag 7/ Question 7

7.1	$R(2;-8)$ $$f(x) = \frac{a}{x}$$ $$-8 = \frac{a}{2}$$ $$\therefore a = -16$$ $$\therefore f(x) = \frac{-16}{x}$$	✓answer/antwoord (1)
7.2	$y = -x$ en/and $$y = -\frac{16}{x}$$ $$\therefore -x = \frac{-16}{x}$$ $$-x^2 = -16$$ $$x^2 = 16$$ $$x = \pm 4$$ $x = 4 \quad y = -4$ $\therefore B(4;-4)$ $x = -4 \quad y = -(-4) = 4$ $\therefore A(-4;4)$	✓equating $f(x) = g(x)$ ✓ $B(4;-4)$ ✓Substituting x ✓ $A(-4;4)$ (4)
7.3	$y = px^2$ $B(4;-4)$ $-4 = p(4)^2$ $-4 = 16p$ $$p = -\frac{1}{4}$$ $\therefore g(x) = -\frac{1}{4}x^2$	✓substitution $B(4;-4)$ in correct formula ✓simplification ✓value $a = \frac{-1}{4}$ ✓equation (4)

7.4	$x \in (-\infty;\infty),\ x \neq 0$	✓ $x \neq 0$ ✓ $(-\infty;+\infty)$ (2)
7.5	$y = x$	✓answer/antwoord (1)
7.6	$m = \dfrac{y_2 - y_1}{x_2 - x_1}$ R$(2;-8)$ and B$(-4;4)$ $= \dfrac{4-(-8)}{-4-2}$ $= \dfrac{12}{-6}$ $m = -2$	✓formula ✓correct substitution ✓answer/antwoord (3)
7.7	$Domain: x \in R$ $Range: y \leq 0$ $or \quad y \in (-\infty;0]$	✓ $x \in R$ ✓ $y \leq 0$ (2)

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Vraag 8/ Question 8

8.1	$y = \left(\dfrac{1}{5}\right)^0$ $y = 1$ $(0;1)$	✓ substitute $x = 0$ ✓answer/antwoord (2)
8.2	f: asymptote $y = 0$ $(x - axis)$	✓answer/antwoord (1)

8.3		$f(x) = \left(\dfrac{1}{5}\right)^x$ ✓ (0;1) ✓ (form/vorm) ✓ (-1;5) / or other coordinate on the graph $g(x) = \dfrac{x}{5}$ ✓ (0;5) ✓ form/vorm ✓ $x \geq 0$ (6)
8.4.1	$y > 0$	✓ answer/antwoord (1)
8.4.2	$y \geq 5$	✓ answer/antwoord (1) **[11]**

Vraag 9/Question 9

9.1		4-Korrek/Correct = 4 marks 3: Korrek/Correct = 3 marks 2: Korrek/Correct = 2marks 1 korrek/correct = 1marks (4)
9.2.1	24	✓ answer (1)

9.2.2	30	✓answer	(1)
9.3	$\dfrac{50}{90} = \dfrac{5}{9}$	✓answer	(1)
9.4	No – 26 students "read" and "watch TV"	✓answer	(1)

[9]

Vraag 10/Question 10

10.1	$P(A \text{ and } B) = 0$	✓Answer	(1)
10.2	$P(\text{A or B}) /$ $P(A \text{ of } B)$ $= P(A) + P(B)$ $= \dfrac{1}{3} + \dfrac{1}{4}$ $= \dfrac{7}{12}$	✓ $P(A) + P(B)$ ✓ $\dfrac{7}{12}$	(2)

[3]

TOTAL:100