LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

MATHEMATICS P1

JUNE 2025

MARKING GUIDELINES

MARKS: 100

These marking guidelines consist of 8 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 guidelines.

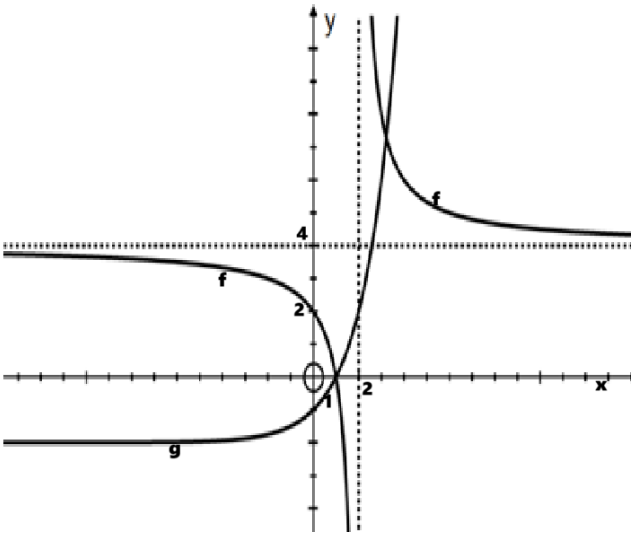
• Assuming values/answers in order to solve a problem is unacceptable.

1.1	1.1.1	$x=4$	✓answer	(1)
	1.1.2	$x=0$	✓answer	(1)
1.2	1.2.1	$x(x-4)=0$ $x=0$ or $x=4$	✓factorization ✓both values of x	(2)
	1.2.2	$3x^2-5x-4=0$ $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ $x=\frac{-(-5)\pm\sqrt{(-5)^2-4(3)(-4)}}{2(3)}$ $x=2,26$ or $x=-0,59$	✓standard form ✓correct formula ✓substitution ✓✓answers Penalize once for incorrect rounding	(5)
	1.2.3	$(2\sqrt{x-3})^2=(x-3)^2$ $4(x-3)=x^2-6x+9$ $4x-12=x^2-6x+9$ $x^2-10x+21=0$ $(x-3)(x-7)=0$ $x=3$ or $x=7$	✓squaring both sides ✓simplification ✓factorizing ✓both factors ✓both values	(5)
	1.2.4	$(x-4)(x+3)\geq -6$ $x^2-x-12+6\geq 0$ $x^2-x-6\geq 0$ $(x-3)(x+2)\geq 0$ $x\leq -2$ or $x\geq 3$	✓simplifying ✓standard form ✓factorization ✓critical values ✓✓answers	(6)

1.3		$(x-y)(5y-3x)=0$ $3y=x+1$ $x=3y-1$ $[3y-1-y][5y-3(3y-1)]=0$ $(2y-1)(-4y+3)=0$ $y=\frac{1}{2}$ or $y=\frac{3}{4}$ $x=\frac{1}{2}$ or $x=\frac{5}{4}$	✓ $x=3y-1$ ✓substitution ✓simplification ✓ $y-$values ✓✓ x-values	(6)
1.4		$3y-4=8$ $3y=12$ $y=4$	✓substitution ✓answers	(2)
				[28]
QUESTION 2				
2.1		$\frac{2^{2025}-2^{2023}}{2^{2021}-2^{2019}}$ $\frac{2^{2019}.2^6-2^{2019}.2^4}{2^{2019}.2^2-2^{2019}}$ $\frac{2^{2019}(2^6-2^4)}{2^{2019}(2^2-1)}$ $\frac{48}{3}$ 16	✓exponential laws ✓factorization ✓simplification ✓answer	(4)
2.2	2.2.1	$\frac{3^{x+4}-6.3^{x+1}}{7.3^{x+2}}$ $\frac{3^x.3^4-6.3^x.3}{7.3^x.3^2}$ $\frac{3^x(3^4-6.3)}{7.3^x.3^2}$ $\frac{81-18}{7\times 9}$ 1	✓Laws of exp ✓factors (common factor) ✓ simplification ✓answer	(4)

	2.2.2	$\sqrt{x+\sqrt{4x-4}} \times \sqrt{x-\sqrt{4x-4}}$ $\sqrt{x^2-(4x-4)}$ $\sqrt{x^2-4x+4}$ $\sqrt{(x-2)^2}$ $x-2$	✓nultiplying ✓simplification ✓factorization ✓answer	(4)
2.3	2.3.1	$5^{\sqrt{x}} = 5^3$ $\sqrt{x} = 3$ $x = 9$	✓same base ✓equating exponents ✓answer	(3)
	2.3.2	$5^x + 15.5^{-x} = 2$ $5^x + 15.\frac{1}{5^x} = 2$ $5^{2x} - 2.5^x + 15 = 0$ $(5^x - 5)(5^x + 3) = 0$ $5^x = 5 \text{ or } 5^x \neq -3$ $\therefore x = 1$ $5^x - 15.5^{-x} = 2$ $5^x - 15.\frac{1}{5^x} = 2$ Let $5^x = k$ $\therefore k - \frac{15}{k} = 2$ $k^2 - 2k - 15 = 0$ $(k-5)(k+3) = 0$ $k = 5 \text{ or } k = -3$ $5^x = 5 \text{ or } 5^x \neq -3$ $\therefore x = 1$	✓positive exponent ✓multiplying by 5^x ✓factorization ✓factors ✓answer ✓positive exponent ✓standard form ✓factorization ✓factors ✓answer	(5)
				[20]

QUESTION 3				
3.1		$x = 2$ $y = 4$	✓answer ✓answer	(2)
3.2		$y\text{ int}, x = 0 \therefore y = \frac{4}{0-2} + 4$ $y = 2$ $x\text{ int}, y = 0 \therefore 0 = \frac{4}{x-2} + 4$ $-4 = \frac{4}{x-2}$ $-4x + 8 = 4$ $x = 1$	✓y=2 ✓simplification ✓x = 1	(3)
3.3		$x \in \Re, x \neq 2$	✓answer	(1)
3.4		$(2; 4);\ m = -1$ $y = mx + c$ $4 = -1(2) + c$ $\therefore c = 6$ $\therefore y = -x + 6$	✓ (2;4) ✓value of c ✓answer	(3)
3.5		$y = 2^x - 2$ $y\text{ int}, x = 0$ $y = 2^0 - 2$ $\therefore y = -1$ $x\text{ int}, y = 0$ $2^x - 2 = 0$ $2^x = 2$ $\therefore x = 1$	✓ $y = -1$ ✓ $x = 1$	(2)
3.6		$y = -2$	✓answer	(1)

3.7			Hyperbola ✓asymptotes ✓intercepts ✓shape Exponential ✓asymptote ✓intercepts ✓shape	(6)
3.8		$x \leq 1$	✓✓answer	(2)
3.9	3.9.1	$h(x) = \frac{x+2}{x-2}$ $\frac{x-2+4}{x-2}$ $\frac{x-2}{x-2} + \frac{4}{x-2}$ $= \frac{4}{x-2} + 1$ $\therefore y = 1$	✓simplification ✓standard form ✓answer	(3)
	3.9.2	Shifted 3 units down	✓3 units ✓down	(2)
				[25]

QUESTION 4				
4.1		$x = \frac{1}{2}$	✓answer	(1)
4.2		$x < \frac{1}{2}$	✓answer	(1)
4.3		$D(-1;4) \quad E(0;6)$ $m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = \frac{6-4}{0-(-1)}$ $\therefore m = 2$	✓substitution in correct formula ✓answer	(2)
4.4		$m = \frac{6-4}{1-(-1)}$ $m = 1$ $y = mx + c$ $6 = 1(1) + c$ $c = 5$ $y = x + 5$	✓ $m = 1$ ✓ $c = 5$ ✓answer	(3)
4.5		$y = ax^2 + bx + c$ for $(0;6)$ $\therefore c = 6$ $4 = a(-1)^2 + b(-1) + 6$ for $(-1;4)$ $a - b = -2$ $6 = a + b + 6$ for $(1;6)$ $\therefore a = -b$ $-b - b = -2$ $-2b = -2$ $b = 1$ $\therefore a = -1$ $\therefore y = -x^2 + x + 6$	✓c = 6 ✓ $a - b = -2$ ✓ $a = -b$ ✓ $b = 1$ ✓ $a = -1$	(5)

4.6		$x = \frac{-b}{2a}$ $x = \frac{-1}{2(-1)}$ $x = \frac{1}{2}$ $y = -\left(\frac{1}{2}\right)^2 + \frac{1}{2} + 6$ $y = 6{,}25$ $\therefore$ Range: $y \leq 6{,}25$	✓value of x ✓value of y ✓answer	(3)
4.7		$-x^2 + x + 6 = 0$ $x^2 - x - 6 = 0$ $(x-3)(x+2) = 0$ $x = 3$ or $x = -2$ $U(3;0)$ $S(-5;0)$ $SU = x_U - x_S$ $SU = 3 - (-5)$ $SU = 8 units$	✓ $y = 0$ ✓factors ✓both values of x ✓x values at S and U ✓answer	(5)
4.8		$f(x) - g(x) \leq 0$ $f(x) \leq g(x)$ $x \leq -1$ or $x \geq 6$	✓ $f(x) \leq g(x)$ ✓✓answer	(3)
4.9		$VW = y_V - y_W$ $VW = -x^2 + x + 6 - (x+5)$ $VW = -x^2 + x + 6 - x - 5$ $= -x^2 + 1$ $x = \frac{-b}{2a}$ $x = \frac{0}{2(-1)} = 0$ $y = 1$ The maximum length of VW is 1unit	✓$VW = -x^2 + x + 6 - (x+5)$ ✓simplification ✓value of x ✓answer	(4)
				[27]

TOTAL: 100