

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
JUNE 2017
GRADE 10**

**MATHEMATICS
PAPER 1**




MEMORANDUM

6 pages

GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION

QUESTION 1		
1.1	Rational	✓ (1)
1.2	Irrational	✓ (1)
1.3	Rational	✓ (1)
		[3]
QUESTION 2		
2.1	$\left(\frac{5}{12}\right)^0$ $= 1$	✓ answer (1)
2.2	$\frac{-1}{-x^{-1}}$ $= x$	✓ answer (1)
2.3	$\frac{9^{x+1} \cdot 5^{x+2}}{45^{x+1}}$ $= \frac{(3^2)^{x+1} \cdot 5^{x+2}}{(3^2 \cdot 5)^{x+1}}$ $= \frac{3^{2x+2} \cdot 5^{x+2}}{3^{2x+2} \cdot 5^{x+1}}$ $= 3^{2x+2-(2x+2)} \cdot 5^{x+2-(x+1)}$ $= 5^1$	✓ 3^{2x+2} ✓ $3^{2x+2} \cdot 5^{x+1}$ ✓ answer (3)
		[5]
QUESTION 3		
3.1	$2x^2 - 14x - 60$ $= 2(x - 10)(x + 3)$	✓ common factor ✓ $(x - 10)$ ✓ $(x + 3)$ (3)
3.2	$\frac{1}{8}x^3 + b^9$ $= \left(\frac{1}{2}x + b^3\right)\left(\frac{1}{4}x^2 - \frac{1}{2}b^3x + b^6\right)$	✓ first factor ✓ second factor (2)
		[5]

QUESTION 4		
4.1	$2 - 3x = 6 - 4x$ $4x - 3x = 6 - 2$ $x = 4$	✓ transposing ✓ answer (2)
4.2	$\frac{x}{2+x} + \frac{x}{3-x} = \frac{3x-2}{x^2-x-6}$ $\frac{x}{x+2} - \frac{x}{x-3} = \frac{3x-2}{(x-3)(x+2)}$ $x(x-3) - x(x+2) = 3x-2$ $x^2 - 3x - x^2 - 2x = 3x - 2$ $-8x = -2$ $x = \frac{1}{4}$	✓ change sign $-\frac{x}{x-3}$ ✓ common denominator $(x+2)(x-3)$ ✓ simplify $x^2 - 3x - x^2 - 2x$ ✓ $-8x = -2$ ✓ answer (5)
4.3	$3^x \cdot 9^{2x+1} = 81$ $3^x \cdot 3^{4x+2} = 3^4$ $3^{5x+2} = 3^4$ $5x+2=4$ $x = \frac{2}{5}$	✓ same bases ✓ equating indices ✓ answer (3)
4.4	$-4 \leq 3x - 1 \leq 5$ $-4 + 1 \leq 3x \leq 5 + 1$ $-3 \leq 3x \leq 6$ $\div 3: \quad -1 \leq x \leq 2$	✓ add 1 to both sides ✓ $\div 3$: on both sides ✓ answer (3)
		[13]

QUESTION 5		
	 Pattern 1  Pattern 2  Pattern 3	
5.1	$T_n = 7n + 3$	✓ $7n$ ✓ 3 (2)
5.2	$T_n = 2n$	✓ $2n$ (1)
5.3.1	$T_{12} = 2(12)$ $= 24$	✓ answer (1)
5.3.2	$T_n = 7n + 3$ $150 = 7n + 3$ $n = 21$	✓ $= 150$ ✓ $n = 21$ (2)
		[6]

QUESTION 6		
6.1	$y = ax^2$ (3;4) $4 = a \cdot 3^2$ $4 = 9a$ $a = \frac{4}{9}$ $y = \frac{4}{9}x^2$	✓ substitution (3; 4) ✓ $a = \frac{4}{9}$ (2)
6.2	$y = \frac{2}{3}x + 2$ and $y = \frac{4}{9}x^2$ $\frac{4}{9}x^2 = \frac{2}{3}x + 2$ $\times 9:$ $4x^2 = 6x + 18$ $\div 2:$ $2x^2 - 3x - 9 = 0$ $(2x+3)(x-3) = 0$ $x < 0:$ $\therefore x_c = -\frac{3}{2}$ $y_c = \frac{2}{3}\left(-\frac{3}{2}\right) + 2$ $= -1 + 2$ $= 1$ $C\left(-\frac{3}{2}; 1\right)$	✓ equating ✓ simplification ✓ correct x co-ordinate ✓ substitute ✓ y co-ordinate (5)

6.3	x -intercept: $y = 0$ $0 = \frac{2}{3}x + 2$ $\times 3: 0 = 2x + 6$ $2x = -6$ $\div 2: x = -3$ WO = 3 units	\checkmark sub $y = 0$ \checkmark answer (+) (2)
6.4	$T(4;3)$	\checkmark answer (1)
		[10]
QUESTION 7		
<p>Point of intersection (1;7)</p>		$y = 3 \cdot 2^x + 1$ \checkmark asymptote \checkmark shape \checkmark y -intercept $y = \frac{6}{x} + 1$ \checkmark shape \checkmark x -intercept \checkmark any other coordinate $\checkmark\checkmark$ answer (1; 7) (8)
		[8]
TOTAL: 50		