GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2017

GRADE 10

MATHEMATICS

PAPER 1

MEMORANDUM
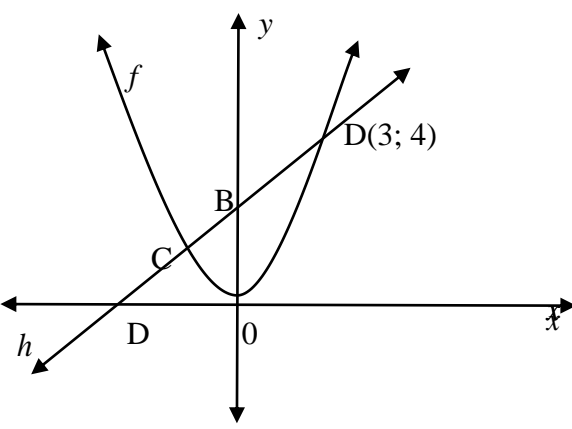
6 pages

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	$\left(\dfrac{5}{12}\right)^0$ $= 1$	✓answer (1)
2.2	$\dfrac{-1}{-x^{-1}}$ $= x$	✓answer (1)
2.3	$\dfrac{9^{x+1}.5^{x+2}}{45^{x+1}}$ $= \dfrac{\left(3^2\right)^{x+1}.5^{x+2}}{\left(3^2.5\right)^{x+1}}$ $= \dfrac{3^{2x+2}.5^{x+2}}{3^{2x+2}.5^{x+1}}$ $= 3^{2x+2-(2x+2)}.5^{x+2-(x+1)}$ $= 5^1$	✓ 3^{2x+2} ✓$3^{2x+2}.5^{x+1}$ ✓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	$\dfrac{1}{8}x^3 + b^9$ $= \left(\dfrac{1}{2}x + b^3\right)\left(\dfrac{1}{4}x^2 - \dfrac{1}{2}b^3x + b^6\right)$	✓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	$\dfrac{x}{2+x}+\dfrac{x}{3-x}=\dfrac{3x-2}{x^2-x-6}$ $\dfrac{x}{x+2}-\dfrac{x}{x-3}=\dfrac{3x-2}{(x-3)(x+2)}$ $x(x-3)-x(x+2)=3x-2$ $x^2-3x-x^2-2x=3x-2$ $-8x=-2$ $x=\dfrac{1}{4}$	✓change sign $-\dfrac{x}{x-3}$ ✓common denominator $(x+2)(x-3)$ ✓simplify x^2-3x-x^2-2x ✓$-8x=-2$ ✓answer (5)
4.3	$3^x.9^{2x+1}=81$ $3^x.3^{4x+2}=3^4$ $3^{5x+2}=3^4$ $5x+2=4$ $x=\dfrac{2}{5}$	✓same bases ✓equating indices ✓answer (3)
4.4	$-4\le 3x-1\le 5$ $-4+1\le 3x\le 5+1$ $-3\le 3x\le 6$ $\div 3:\qquad -1\le x\le 2$	✓add 1 to both sides ✓$\div 3:$ on both sides ✓answer (3)
		[13]

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

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

6.3	x-intercept: $y = 0$	
	$0 = \dfrac{2}{3}x + 2$	
	$\times 3:\ 0 = 2x + 6$	✓sub $y = 0$
	$\qquad 2x = -6$	
	$\div 2:\quad x = -3$	✓answer (+)
		(2)
	WO = 3 units	
6.4	$T(4;3)$	✓answer
		(1)
		[10]

QUESTION 7

  Point of intersection (1;7)	$y = 3.2^x + 1$ ✓ asymptote ✓shape ✓ y-intercept $y = \dfrac{6}{x} + 1$ ✓shape ✓ x-intercept ✓any other coordinate ✓✓ answer (1; 7) (8)

| | **[8]** |
| | **TOTAL: 50** |