GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2017

GRADE 10

MATHEMATICS

PAPER 1

MEMORANDUM

6 pages

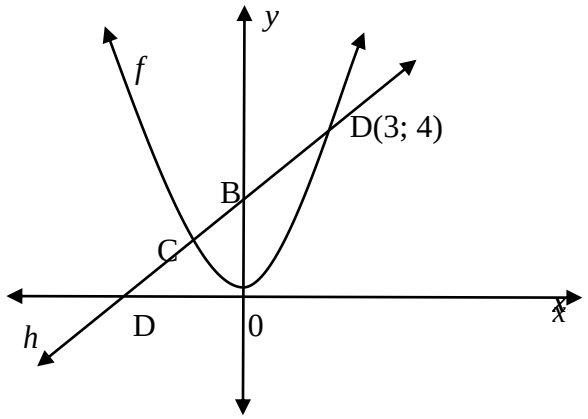
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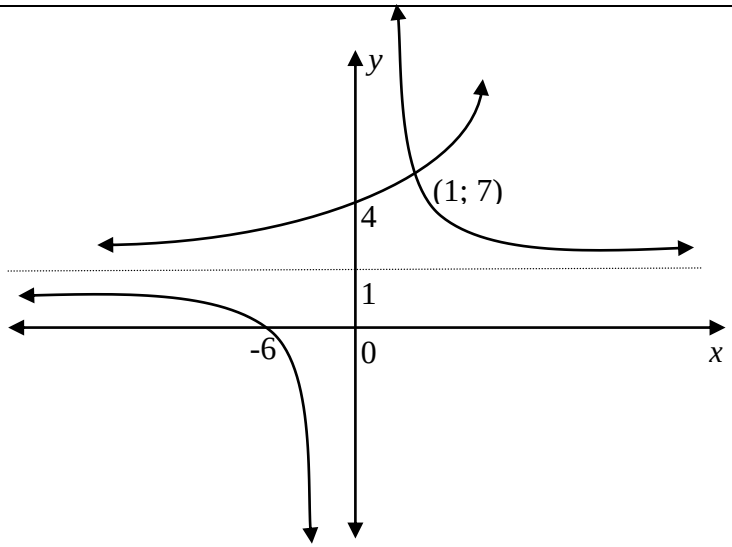
PROVINCIAL EXAMINATION

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	$\frac{9^{x+1}.5^{x+2}}{45^{x+1}}$ $=\frac{\left(3^2\right)^{x+1}.5^{x+2}}{\left(3^2.5\right)^{x+1}}$ $=\frac{3^{2x+2}.5^{x+2}}{3^{2x+2}.5^{x+1}}$ $=3^{2x+2-(2x+2)}.5^{x+2-(x+1)}$ $=5^1$	✓ 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	$\frac{1}{8}x^3+b^9$ $=\left(\frac{1}{2}x+b^3\right)\left(\frac{1}{4}x^2-\frac{1}{2}b^3x+b^6\right)$	✓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	$3^x.9^{2x+1}=81$ $3^x.3^{4x+2}=3^4$ $3^{5x+2}=3^4$ $5x+2=4$ $x=\frac{2}{5}$	✓same bases ✓equating indices ✓answer (3)
4.4	$-4\le 3x-1\le 5$ $-4+1\le 3x\le 5+1$ $-3\le 3x\le 6$ $\div 3:\quad -1\le x\le 2$	✓add 1 to both sides ✓$\div 3$: on both sides ✓answer (3)
		[13]

QUESTION 5		
	 Pattern 1  Pattern 2  Pattern 3	
5.1	$T_n = 7n + 3$	✓$7n$ ✓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) $4 = a.3^2$ $4 = 9a$ $a = \frac{4}{9}$ $y = \frac{4}{9}x^2$	✓substitution (3; 4) ✓ $a = \frac{4}{9}$ (2)
6.2	$y = \frac{2}{3}x + 2$ and $y = \frac{4}{9}x^2$ $\frac{4}{9}x^2 = \frac{2}{3}x + 2$ $\times 9$: $4x^2 = 6x + 18$ $\div 2$: $2x^2 - 3x - 9 = 0$ $(2x+3)(x-3) = 0$ $x < 0$: $\therefore \quad x_C = -\frac{3}{2}$ $y_C = \frac{2}{3}\left(-\frac{3}{2}\right) + 2$ $= -1 + 2$ $= 1$ $C\left(-\frac{3}{2}; 1\right)$	✓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	✓sub $y=0$ ✓answer (+) (2)
6.4	$T(4;3)$	✓answer (1)
		[10]
QUESTION 7		
	 Point of intersection (1;7)	$y=3.2^x+1$ ✓ asymptote ✓shape ✓ y-intercept $y=\frac{6}{x}+1$ ✓shape ✓ x-intercept ✓any other coordinate ✓✓ answer (1; 7) (8)
		[8]
		TOTAL: 50