GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2016

GRADE 10

MATHEMATICS
(PAPER 1)

MEMORANDUM

6 pages

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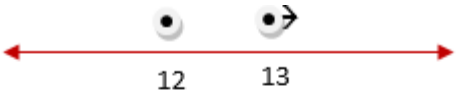
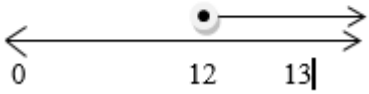
MATHEMATICS
(Paper 1)

MEMORANDUM

QUESTION 1					
1.1	$0{,}88 = \frac{88}{100} = \frac{44}{50} = \frac{22}{25}$		✓Any acceptable fraction	(1)	
1.2	$x = 11$ undefined		11✓	(1)	
1.3	Between 6 and 7		6✓,7✓	(2)	
					[4]
QUESTION 2					
2.1	2.1.1	$(2x+3)(2x^2-x-2)$ $= 4x^3 - 2x^2 - 4x + 6x^2 - 3x - 6$ $= 4x^3 + 4x^2 - 7x - 6$	multiplication✓ simplification✓	(2)	
	2.1.2	$\frac{x+3}{x-3} \times \frac{x^3-27}{x^2-9} \times \frac{x-3}{x^2+3x+9}$ $= \frac{x+3}{x-3} \times \frac{(x-3)(x^2+3x+9)}{(x-3)(x+3)} \times \frac{x-3}{x^2+3x+9}$ $= 1$	$(x-3)(x^2+3x+9)$ $(x-3)(x+3)$ ✓✓ 1✓	(3)	
	2.1.3	$\frac{2x^2y^{-2} \times 8x^{-5}y^8}{(2x^{-2}y^4)^2}$ $= \frac{16x^{-3}y^6}{4x^{-4}y^8}$ $= 4xy^{-2}$ $= \frac{4x}{y^2}$	$x^{-3}y^6$✓ $4x^{-4}y^8$✓ $\frac{4x}{y^2}$✓	(3)	

		OR $= \frac{2x^2y^{-2}8x^{-5}y^8}{4x^{-4}.y^8}$ $= \frac{2x^2.x^4.8y^8}{4y^8.y^2.x^5}$ $= 4xy^{-2}$ $= \frac{4x}{y^2}$	OR $x^{-4}y^8$✓ $2x^2.x^4.8y^8$✓ $\frac{4x}{y^2}$✓		
2.2	2.2.1	$(2a-1)(a+5)$	$(2a-1)$✓ $(a+5)$ ✓	(2)	
	2.2.2	$a^2+a(4+b)+4b$ $=a^2+4a+ab+4b$ $=(a^2+4a)+(ab+4b)$ $=a(a+4)+b(a+4)$ $=(a+b)(a+4)$	$4a+ab$ ✓ $a(a+4)+b(a+4)$✓ Accept alternative grouping $(a+b)(a+4)$ ✓	(3)	
					[13]
QUESTION 3					
3.1	3.1.1	$(x-a)(x+b)=0$ $x-a=0$ or $x+b=0$ $x=a$ or $x=-b$	$x=a$ ✓ $x=-b$ ✓	(2)	
	3.1.2	$2^x+2^{x-1}=12$ $2^x\left(1+\frac{1}{2}\right)=12$ $2^x=8$ $x=3$	2^x ✓ $\left(1+\frac{1}{2}\right)$ ✓ or $(1+2^{-1})$ 8 ✓ or 2^3 $x=3$ ✓	(4)	

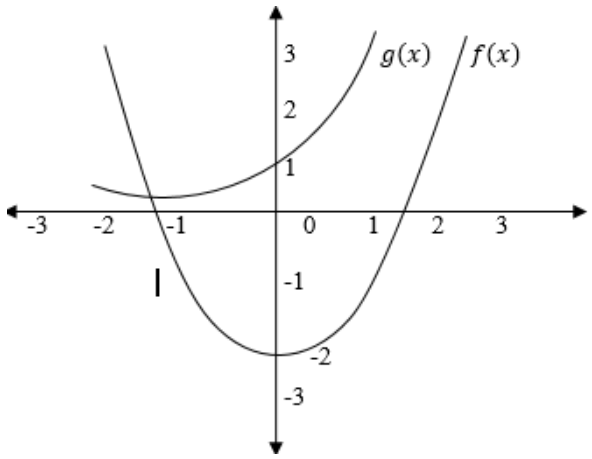
3.2	$2(2x-3)-18\geq 2x$ $4x-6-18\geq 2x$ $4x-2x\geq 6+18$ $2x\geq 24$ $x\geq 12$   	Simplification $4x-6$ ✓ $x\geq 12$ ✓ Representing on the number line and 12 included ✓ and arrow ✓ NOTE: If 12 is included with a line - 1mark	(4)	

→

3.3	$2x + y = 6$ … … … …1			
	$4x + 3y = 10$ …….2			
	$y = 6 - 2x$ … … … …..3	$y = 6 - 2x$ ✓		
	Sub 3 in 2	substitution✓		
	$4x + 3(6 - 2x) = 10$			
		$18 - 6x$ ✓		
	$4x + 18 - 6x = 10$	$x = 4$ ✓		
	$-2x = -8$			
	$x = 4$	$y = -2$ ✓		
	Sub $x = 4$ in equation 1			
	$2(4) + y = 6$			
	$8 + y = 6$			
	$y = -2$			
	Alternative method (elimination method)			
	$2x + y = 6$ … … … … …..1			
	$4x + 3y = 10$ … … … … … … 2			
	Multiply equation 1 by 2	Multiply by 2 ✓		
	$4x + 2y = 12$ ……..3			
	$4x + 3y = 10$ ……..2			
	Subtract equation 2 from equation 3	Eliminating x ✓		
	$-y = 2$			
	$\therefore y = -2$			
	Sub $y = -2$ in equation 2	$y = -2$ ✓		
	$4x + 3(-2) = 10$			
	$4x - 6 = 10$	Substitution✓		
	$4x = 16$			
	$x = 4$	$x = 4$ ✓	(5)	**[15]**

QUESTION 4					
4.1	4.1.1	$\frac{10}{14}$; $\frac{12}{17}$	✓14✓17	(2)	
	4.1.2	Top $= 2n$ Bottom $=3n-1$ $T_n = \frac{2n}{3n-1}$	$3n$✓-1 ✓	(2)	
4.2	4.2.1	$T_n = -2n^3$ $T_8 = -2(8)^3$ $T_8 = -1024$	-1024 ✓	(1)	
	4.2.2	$-432 = -2n^3$ $\frac{-432}{-2} = \frac{-2n^3}{-2}$ $216 = n^3$ $6 = n$	$T_n = -432$ ✓ $6 = n$ ✓	(2)	
					[7]

QUESTION 5

5.1	5.1.1	$f(x)=x^2-2$ $g(x)=3^x$ x | -1 | 0 | 1 y | -1 | -2 | -1 x | -1 | 0 | 1 y | $\frac{1}{3}$ | 1 | 3  	f(x) and $g(x)$ y-intercept✓✓ ✓✓shape both graphs	(4)
	5.1.2	$x > 0$	$x > 0$ ✓	(1)
	5.1.3	$y \geq -2$ OR $[-2;\infty)$	$y \geq -2$ ✓ OR $[-2;\infty)$ ✓ (brackets MUST be correct)	(1)
	5.1.4	2 units down	2 down✓✓	(2)
5.2		$g(x)=\frac{a}{x}+q$ $-5=\frac{a}{5}-2$ $-15=a$ $g(x)=\frac{-15}{x}-2$	substitution of asymptote ✓ substitution (5;-5) ✓ $a=-15$✓	(3) **[11]**
			TOTAL:	**50**