



**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
JUNE 2016
GRADE 10**

**MATHEMATICS
(PAPER 1)**

MEMORANDUM

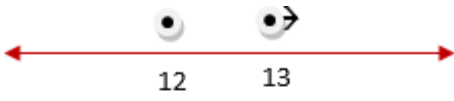
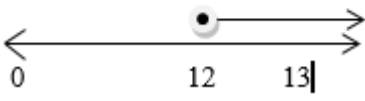
6 pages

GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATIONMATHEMATICS
(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 $= \frac{2x^2 y^{-2} 8x^{-5} y^8}{4x^{-4} \cdot y^8}$ $= \frac{2x^2 \cdot x^4 \cdot 8y^8}{4y^8 \cdot y^2 \cdot x^5}$ $= 4xy^{-2}$ $= \frac{4x}{y^2}$	OR $x^{-4} y^8 \checkmark$ $2x^2 \cdot x^4 \cdot 8y^8 \checkmark$ $\frac{4x}{y^2} \checkmark$		
2.2	2.2.1	$(2a - 1)(a + 5)$	$(2a - 1) \checkmark$ $(a + 5) \checkmark$	(2)	
	2.2.2	$a^2 + a(4 + b) + 4b$ $= a^2 + 4a + ab + 4b$ $= (a^2 + 4a) + (ab + 4b)$ $= a(a + 4) + b(a + 4)$ $= (a + b)(a + 4)$	$4a + ab \checkmark$ $a(a + 4) + b(a + 4) \checkmark$ Accept alternative grouping $(a + b)(a + 4) \checkmark$	(3)	
					[13]
QUESTION 3					
3.1	3.1.1	$(x - a)(x + b) = 0$ $x - a = 0$ or $x + b = 0$ $x = a$ or $x = -b$	$x = a \checkmark$ $x = -b \checkmark$	(2)	
	3.1.2	$2^x + 2^{x-1} = 12$ $2^x \left(1 + \frac{1}{2}\right) = 12$ $2^x = 8$ $x = 3$	$2^x \checkmark$ $\left(1 + \frac{1}{2}\right) \checkmark$ or $(1 + 2^{-1})$ $8 \checkmark$ or 2^3 $x = 3 \checkmark$	(4)	

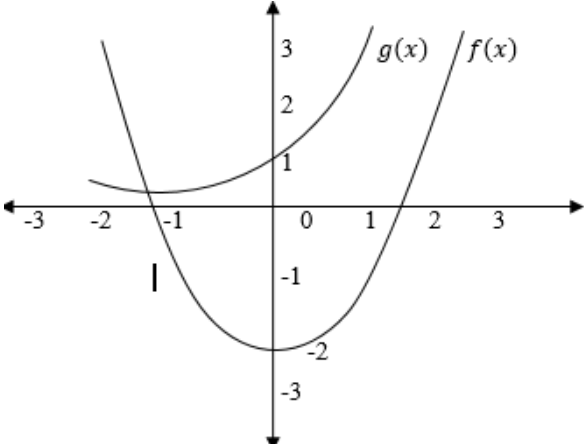
3.2	$2(2x-3)-18 \geq 2x$ $4x-6-18 \geq 2x$ $4x-2x \geq 6+18$ $2x \geq 24$ $x \geq 12$  	Simplification $4x-6$ ✓ $x \geq 12$ ✓ Representing on the number line and 12 included ✓ and arrow ✓ NOTE: If 12 is included with a line - 1 mark	(4)	
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3.3	$2x + y = 6 \dots\dots\dots 1$ $4x + 3y = 10 \dots\dots\dots 2$ $y = 6 - 2x \dots\dots\dots 3$ Sub 3 in 2 $4x + 3(6 - 2x) = 10$ $4x + 18 - 6x = 10$ $-2x = -8$ $x = 4$ Sub $x = 4$ in equation 1 $2(4) + y = 6$ $8 + y = 6$ $y = -2$ Alternative method (elimination method) $2x + y = 6 \dots\dots\dots 1$ $4x + 3y = 10 \dots\dots\dots 2$ Multiply equation 1 by 2 $4x + 2y = 12 \dots\dots\dots 3$ $4x + 3y = 10 \dots\dots\dots 2$ Subtract equation 2 from equation 3 $-y = 2$ $\therefore y = -2$ Sub $y = -2$ in equation 2 $4x + 3(-2) = 10$ $4x - 6 = 10$ $4x = 16$ $x = 4$	$y = 6 - 2x \checkmark$ substitution \checkmark $18 - 6x \checkmark$ $x = 4 \checkmark$ $y = -2 \checkmark$ Multiply by 2 \checkmark Eliminating $x \checkmark$ $y = -2 \checkmark$ Substitution \checkmark $x = 4 \checkmark$	(5)	[15]
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QUESTION 4					
4.1	4.1.1	$\frac{10}{14}; \frac{12}{17}$	$\checkmark 14 \checkmark 17$	(2)	
	4.1.2	Top = $2n$ Bottom = $3n - 1$ $T_n = \frac{2n}{3n-1}$	$3n \checkmark - 1 \checkmark$	(2)	
4.2	4.2.1	$T_n = -2n^3$ $T_8 = -2(8)^3$ $T_8 = -1024$	$-1024 \checkmark$	(1)	
	4.2.2	$-432 = -2n^3$ $\frac{-432}{-2} = \frac{-2n^3}{-2}$ $216 = n^3$ $6 = n$	$T_n = -432 \checkmark$ $6 = n \checkmark$	(2)	
					[7]

QUESTION 5

5.1	5.1.1	<div>$f(x)=x^2-2$ $g(x)=3^x$</div> <div><table><tr><td>x</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>y</td><td>-1</td><td>-2</td><td>-1</td></tr></table><table><tr><td>x</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>y</td><td>$\frac{1}{3}$</td><td>1</td><td>3</td></tr></table></div> <div></div>	x	-1	0	1	y	-1	-2	-1	x	-1	0	1	y	$\frac{1}{3}$	1	3	<div>$f(x)$ and $g(x)$ y-intercept✓✓ ✓✓ shape both graphs</div>	(4)
x	-1	0	1																	
y	-1	-2	-1																	
x	-1	0	1																	
y	$\frac{1}{3}$	1	3																	
	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	<div>$g(x) = \frac{a}{x} + q$ $-5 = \frac{a}{5} - 2$ $-15 = a$ $g(x) = \frac{-15}{x} - 2$</div>		<div>substitution of asymptote ✓ substitution (5;-5) ✓ $a = -15$✓</div>	<div>(3) [11]</div>																
TOTAL:				50																