

ALGEBRA TEST**MEMORANDUM****QUESTION 1**

1.1.1	Rational ✓	(1)
1.1.2	Rational ✓	(1)
1.1.3	Irrational ✓	(1)
1.1.4	Rational ✓	(1)
1.1.5	Irrational ✓	(1)
1.2	$x = 0,\overline{81}$ $100x = 81,\overline{81}$ ✓ $\underline{-x = 0,\overline{81}}$ $99x = 81$ ✓ $x = \frac{81}{99}$ ✓	(3)
1.3	$8a^3 + 12a^2b + 18ab^2 - 12a^2b - 18ab^2 - 27b^3$ ✓✓ $= 8a^3 - 27b^3$ ✓	(3)
		[11]

QUESTION 2

2.1	$3x(x^2 - 4)$ ✓ $= 3x(x + 2)(x - 2)$	(3)
2.2	$x^2 - 8x + 15$ ✓ $= (x - 5)(x - 3)$	(3)
2.3	$2a(3a + 1) - b(3a + 1)$ ✓ $= (3a + 1)(2a - b)$	(3)
2.4	$(2b + 3)(4b^2 - 6b + 9)$ ✓✓	(3)
2.5	$(2x - 3)(3x + 5)$ ✓✓✓	(3)
		[15]

QUESTION 3

3.1	$8x + 8 - 2x = 21 - 7x$ ✓ $8x - 2x + 7x = 21 - 8$ ✓ $13x = 13$ ✓ $x = 1$ ✓	<i>Brackets</i> <i>Like terms</i> <i>Simplify</i> <i>Ans</i>	(4)
3.2	$\frac{3(x+2)}{(x-2)(x+2)} + \frac{3(x-2)}{(x+2)(x-2)} = \frac{2}{(x+2)(x-2)}$ ✓ $3(x+2) + 3(x-2) = 2$ ✓ $3x + 6 + 3x - 6 = 2$ ✓ $6x = 2$ $x = \frac{1}{3}$ ✓	<i>LCD</i> <i>Drop denominators</i> <i>Brackets</i> <i>Ans</i>	(4)
3.3	$x^2 - 10x = x - 10$ $x^2 - 11x + 10 = 0$ ✓ $(x - 10)(x - 1) = 0$ ✓ $x = 10$ or $x = 1$ ✓	<i>Brackets</i> <i>Standard form</i> <i>Factors</i> <i>Answers</i>	(4)
3.4	$x = 5 - 3y$ ✓ $2(5 - 3y) - 2y = 2$ $10 - 6y - 2y = 2$ $-8y = -8$ $y = 1$ ✓ $x = 5 - 3(1)$ $x = 2$ ✓	<i>Isolate x</i> <i>Subs</i> <i>Ans</i> <i>Ans</i>	(4)
3.5	$x + a = 2(x - b)$ ✓ $x + a = 2x - 2b$ ✓ $x - 2x = -a - 2b$ ✓ $-x = -a - 2b$ $x = a + 2b$ ✓	<i>Cross mult.</i> <i>Brackets</i> <i>Like terms</i> <i>Ans</i>	(4)
3.6	$\frac{3x}{12} + \frac{180}{12} > \frac{20x}{12} - \frac{24}{12}$ ✓ $3x + 180 > 20x - 24$ ✓ $3x - 20x > -24 - 180$ ✓ $-17x > -204$ $x < 12$	<i>LCD</i> <i>Drop fractions</i> <i>Like terms</i> <i>Ans</i>	(4)
			[24]

QUESTION 4

4.1	$\frac{5b(a-3)}{4(a-3)} \times \frac{a+b}{6b^2}$ $= \frac{5(a+b)}{24b}$	<i>Factorisation</i> <i>Flip and times</i> <i>Ans</i>	(4)
4.2	$\frac{5(y-3)}{(y-2)(y-3)} - \frac{1(y-2)}{(y-3)(y-2)}$ $= \frac{5(y-3) - (y-2)}{(y-2)(y-3)}$ $= \frac{5y - 15 - y + 2}{(y-2)(y-3)}$ $= \frac{4y - 13}{(y-2)(y-3)}$	<i>LCD</i> <i>Long dividing line</i> <i>Brackets</i> <i>Ans</i>	(4)

QUESTION 5

5.1	2^{3x+4x} $= 2^{7x}$	<i>Ans</i>	(1)
5.2	$6(1) \times (1)$ $= 6$	<i>Base⁰ = 1</i> <i>Ans</i>	(3)
5.3	$\frac{a^6 b^9}{a^3 b^{15}}$ $= a^{6-3} b^{9-15}$ $= a^3 b^{-6}$ $= \frac{a^3}{b^6}$	<i>Power into bracket</i> <i>Group same bases</i> <i>Ans</i>	(3)
5.4	$\frac{3^x \cdot 3^{-2} + 3^x \cdot 3^{-1}}{3^x + 3^x \cdot 3^1}$ $= \frac{3^x(3^{-2} + 3^{-1})}{3^x(1 + 3^1)}$ $= \frac{1}{9}$	<i>Separate bases with exp with mult terms</i> <i>Factorise</i> <i>Ans</i>	(3)
5.5	$\frac{2^{2n} \times (2^2)^n \times 2^1}{(2^4)^n}$ $= \frac{2^{2n} \times 2^{2n} \times 2^1}{2^{4n}}$ $= 2^{2n+2n+1-4n}$ $= 2^1$ $= 2$	<i>Prime factors</i> <i>Group same bases</i> <i>Ans</i>	(3)

5.6	$\frac{5^{2x-1} \cdot (3^2)^{x-2}}{(3 \cdot 5)^{2x-3}}$ $= \frac{5^{2x-1} \cdot 3^{2x-4}}{3^{2x-3} \cdot 5^{2x-3}}$ $= 5^{2x-1-(2x-3)} \cdot 3^{2x-4-(2x-3)}$ $= 5^{2x-1-2x+3} \cdot 3^{2x-4-2x+3}$ $= 5^2 \cdot 3^{-1}$ $= \frac{25}{3}$	<i>Prime factors</i> <i>Power into brackets</i> <i>Group same bases</i> <i>Ans</i>	(4)

Total: 75 Marks