Year 10 Assessment 1 – Mar 02
Algebra and Equations

Time allowed: 2periods

SECTION A:

Answer the following in the given space. Show all necessary working.

1. Simplify the following expressions
    (8 marks)

(a) $7a - b + a - 3b =$

(b) $18xy \div 6y - 7x$

(c) $\dfrac{3a}{5} + \dfrac{7a}{4} =$

(d) $m - \left(\dfrac{m}{2} - \dfrac{2m}{3}\right) =$

(e) $\dfrac{4}{5x} + \dfrac{1}{3x} =$

2. Expand each of the following, simplifying wherever possible. (8 marks)

(a) $4(x - 2y) + 3(4x + y) =$

(b) $2(a + b) - (b - a) =$

(c) $(2x+1)(x+3) =$

(b) $\left(\dfrac{16}{81}\right)^{\frac{3}{2}}$

(d) $(2a-3b)(4b-a)$

(c) $8\left(a^0 - 4^{\frac{1}{2}}\right) =$

3.   Simplify the following: (6 marks)

(d)   If $3^{x-4} = 27$, find the value of x.

(a) $8a \times 4ba \times 3a^2 =$

(b) $3x^3 y^{-5} \times 6x^3 y^5$

(c) $\dfrac{5}{8} p^4 \times 4pq^6 \times \dfrac{1}{5} pq =$

(e)   If $\dfrac{x+y}{x-y} = \dfrac{7}{3}$, find the value of $\dfrac{4x}{y}$.

(d) $\dfrac{6x^2 y^3}{12} \times \dfrac{3xy}{10x^5 y^4} =$

4. Evaluate the following without the use of
   your calculator: (11 marks)

(a) $4^{-\frac{1}{2}} =$

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5. Make x the subject of the formula in each case: (11 marks)

(a) $y = 2x - 3$

(b) $\dfrac{y}{3} = \dfrac{2}{x-1}$

(c) $x^2 + y^2 = 10$

(d) $y = \sqrt{\dfrac{x}{5}}$

(e) $\dfrac{x-1}{x+1} = y$

(f) $(x+3)^2 = 4y^2$

6. Solve the following equations: (10 marks)

(a) $x + 13 = 4$

(b) $2x - 9 = 11$

(c) $\dfrac{2x}{3} = 5$

(d) $\dfrac{2}{x-1} = 5$

(e) $4x - 7 = 11 - 2x$

(f) $\dfrac{3}{2 - \dfrac{x}{3}} = \dfrac{1}{4}$

7. Solve these simultaneous equations: (17 marks)

(a) $2x + y = 7$ and $x - y = 8$.

(b) $3x + 2y = 10$ and $2x + y = -3$

(c) $\dfrac{2x-3}{5} - \dfrac{y+3}{3} = 1$ and

$2x - 3y = 17$.

(d) $y = x^2$ and $y = 2x + 15$

(e) $x + y = 4$ and $(x+2)^2 + (y-1)^2 = 25$.

(1) (a) $8a - 4b$

(b) $-4x$

(c) $\dfrac{47a}{20}$

(d) $\dfrac{7m}{6}$

(e) $\dfrac{17}{15x}$.

(2) (a) $16x - 5y$

(b) $3a + b$

(c) $2x^2 + 7x + 3$

(d) $11ab - 2a^2 - 12b^2$

(3) (a) $96a^4b$

(b) $18x^6$

(c) $\dfrac{p^6 q^7}{2}$

(d) $\dfrac{3}{20x^2}$

(4) (a) $\dfrac{1}{2}$

(b) $\dfrac{64}{729}$

(c) -8

(d) 7

(e) 10

(5) (a) $x = \dfrac{y+3}{2}$

(b) $x = \dfrac{6+y}{y}$

(c) $x = \pm\sqrt{10 - y^2}$

(d) $x = 5y^2$

(e) $x = \dfrac{1+y}{1-y}$

(f) $x = -3 \pm 2y$

(6) (a) $x = -9$

(b) $x = 10$

(c) $x = 7\dfrac{1}{2}$

(d) $x = 1\dfrac{2}{5}$

(e) $x = 3$

(f) $x = -30$

(7) (a) $x = 5, y = -3$

(b) $x = -16, y = -35$

(c) $x = 4, y = -3$

(d) $x = 5, y = 25;\ \ x = -3, y = 9$

(e) $x = 3, y = 1;\ \ x = -2, y = 6$