YEAR 8 TEST – SYDNEY BOYS' HIGH SCHOOL
ALGEBRA – 2006

Name:

1) Write "three times the sum of a and b" in algebraic form. [2 marks]

2) Simplify where possible: [5 marks]

a) $12ab - 6ba =$

b) $x^2 + x - x^2 + 5x =$

c) $4xy - (-3xy) =$

d) $4x - (-2x) + 6 - x =$

e) $7a \times 5b \times 2b =$

3) Write in algebraic form: "the sum of the squares of p and q". [2 marks]

4) Expand and simplify: [4 marks]

a) $x(4 - 5x) =$

b) $-p(2p^2 + 1) =$

c) $2a - 3 - 4(a + 3) =$

d) $2x(x - 3) + x(3x - 1) =$

5) There are 12 books on a shelf and Dylan removes x of them. How many are left on the shelf? [2 marks]

6) Factorise fully: [4 marks]

a) $4x-12=$

b) $ab+bc=$

c) $4x-x^2=$

d) $2x^3+2x^2+4x=$

7) A bar of chocolate costs y cents. How much would 12 bars cost, in dollars? [2 marks]

8) Simplify [5 marks]

a) $2a\times5a^2=$

b) $6a^2b\times3ab^2=$

c) $16x^{14}\div4x^{11}=$

d) $2(5ab^2)^3=$

e) $\dfrac{y^6\times y^{15}}{(y^3)^4}=$

9) Three consecutive odd numbers, the largest being x, are ....., ... and ..... [2 marks]

10) Write as a single fraction: [12 marks]

a) $\frac{x}{12} \times 4 =$

b) $\left(\frac{3}{2x}\right)^2 =$

c) $\frac{2x}{3} \div \frac{x^2}{4} =$

d) $\frac{x}{3} + \frac{x}{4} =$

e) $\frac{a}{5} - \frac{2a}{3} =$

f) $\frac{2x-3}{5} - \frac{4-x}{2} =$

11) Fill in the blanks so it is a true statement. [2 marks]

$(\_\_x - 2)(x + \_\_) = 4x^2 + 2x - \_\_\_.$

12) Expand and simplify these binomials: [10 marks]

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

b) $(2x-1)(x+1) =$

c) $(b+5)(b-5) =$

d) $(3-c)(c+1) =$

e) $(5x-3)^2 =$

13) State the Distributive Law in terms of a, b and c. Draw on arrows and clearly indicate which directions we use this law for the operations of expanding and factorising. [3 marks]

14) A piece of wire 12 cm long is bent into rectangle. If one side of the rectangle is x cm find the area of the rectangle in terms of x. [4 marks]

$\frac{52}{59} \approx 88\%$

YEAR 8 TEST – SYDNEY BOYS' HIGH SCHOOL
ALGEBRA – 2006

Name: Thomas Dw

1) Write "three times the sum of a and b" in algebraic form. [2 marks]

$3 \times (a+b)$ ✓

2) Simplify where possible: [5 marks]

a) $12ab - 6ba =$ $6ab$ ✓

b) $x^2 + x - x^2 + 5x =$ $6x$ ✓

c) $4xy - (-3xy) =$ $7xy$ ✓

d) $4x - (-2x) + 6 - x =$ $5x + 6$ ✓

e) $7a \times 5b \times 2b =$ $70ab^2$ ✓

3) Write in algebraic form: "the sum of the squares of p and q". [2 marks]

$p^2 + q^2$ ✓

4) Expand and simplify: [4 marks]

a) $x(4-5x) =$ $4x - 5x^2$ ✓

b) $-p(2p^2+1) =$ $-2p^3 - p$ ✓

c) $2a - 3 - 4(a+3) =$ $2a - 3 - 4a - 12$
$= -2a - 15$ ✓

d) $2x(x-3) + x(3x-1) =$ $2x^2 - 6x + 3x^2 - x$ ✓
$= 5x^2 - 7x$ ✓

5) There are 12 books on a shelf and Dylan removes x of them. How many are left on the shelf? [2 marks]

$12 - x$ ✓

6) Factorise fully: [4 marks]

a) $4x - 12 =$ $4(x-3)$ ✓

b) $ab + bc =$ $b(a+c)$ ✓

c) $4x - x^2 =$ $x(4-x)$ ✓

d) $2x^3 + 2x^2 + 4x =$ $2x(x^2 + x + 2)$ ✓

7) A bar of chocolate costs y cents. How much would 12 bars cost, in dollars? [2 marks]

$\frac{12xy}{100}$ ✓

8) Simplify [5 marks]

a) $2a \times 5a^2 =$ $10a^3$ ✓

b) $6a^2b \times 3ab^2 =$ $18a^3b^3$ ✓

c) $16x^{14} \div 4x^{11} =$ $4x^3$ ✓

d) $2(5ab^2)^3 =$ $2(125a^3b^6)$ ✓ $= 250a^3b^6$
$250\ a^3\ b^6$

e) $\frac{y^6 \times y^{15}}{(y^3)^4} =$ $\frac{y^{21}}{y^{12}} = y^9$ ✓

9) Three consecutive odd numbers, the largest being x, are $x-2$ ✓ and $x-4$ ✓ [2 marks]

10) Write as a single fraction: [12 marks]

a) $\frac{x}{12} \times 4 = \frac{4x}{12} = \frac{x}{3}$ ✓

b) $\left(\frac{3}{2x}\right)^2 = \frac{9}{4x^2}$ ✓

c) $\frac{2x}{3} \div \frac{x^2}{4} = \frac{8x}{3x^2} = \frac{8}{3x}$ ✓

d) $\frac{x}{3} + \frac{x}{4} = \frac{4x}{12} + \frac{3x}{12} = \frac{7x}{12}$ ✓

e) $\frac{a}{5} - \frac{2a}{3} = \frac{3a}{15} - \frac{10a}{15} = -\frac{7a}{15}$ ✓

f) $\frac{2x-3}{5} - \frac{(4-x)}{2} = \frac{4x-6}{10} - \frac{(20-5x)}{10} = \frac{14-x}{10}$ ✗

$= \frac{9x-26}{18}$

11) Fill in the blanks so it is a true statement, [2 marks]

$(4x-2)(x+1) = 4x^2 + 2x - 2$ ✓ ✓

12) Expand and simplify these binomials: [10 marks]

a) $(x+3)(x-4) = x^2 - 4x + 3x - 12$ ✓
$= x^2 - x - 12$ ✓

b) $(2x-1)(x+1) = 2x^2 + 2x - x - 1$ ✓
$= 2x^2 + x - 1$ ✓

c) $(b+5)(b-5) = b^2 - 5b + 5b - 25$ ✓
$= b^2 - 25$ ✓

d) $(3-c)(c+1) = 3c + 3 - c^2 - c$ ✓
$= 2c + 3 - c^2$

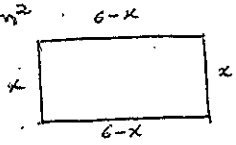
e) $(5x-3)^2 = 25x^2 - 15x + 9 - 15x$ ✓
$= 25x^2 - 30x + 9$ ✓

13) State the Distributive Law in terms of a, b and c. Draw on arrows and clearly indicate which directions we use this law for the operations of expanding and factorising. [3 marks]

$a(b+c)$ ✓

14) A piece of wire 12 cm long is bent into rectangle. If one side of the rectangle is x cm find the area of the rectangle in terms of x. [4 marks]

$4 \times 2 = 8\text{cm}^2$



Area $= x(6-x)$
$= 6x - x^2$