Preliminary 3 Unit Notes

Curly Macadam

1 Algebra

1.1 Index laws

1. $a^m \times a^n = a^{m+n}$

2. $a^m \div a^n = a^{m-n}$

3. $(a^m)^n = a^{mn}$

4. $(ab)^n = a^n b^n$

5. $\left(\dfrac{a}{b}\right)^n = \dfrac{a^n}{b^n}$

6. $a^0 = 1$

7. $a^{-n} = \dfrac{1}{x^n}$

8. $a^{\frac{1}{n}} = \sqrt[n]{a}$

1.2 Binomial Products

$$(a+b)(x+y) = ax + ay + bx + by$$
$$(a+b)(a-b) = a^2 - b^2$$
$$(a+b)^2 = a^2 + 2ab + b^2$$
$$(a-b)^2 = a^2 - 2ab + b^2$$

1.3 Factorising

$$x^2 + (a+b) + ab = (x+a)(x+b)$$
$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$
$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$