**FACTORISATION**

Sum of and Difference between two cubes

To factorise the sum of two cubes : $a^{3}+b^{3}$

* **First bracket :**  Cube root of the first cube + cube root of second cube.
* **Second bracket :** Use the values in the first bracket to calculate the second bracket:

(first term)2 + (first term) x (second term) + (second term)2

* $a^{3}+b^{3}=(a+b)(a^{2}-ab+b^{2})$

To factorise the difference of two cubes : $a^{3}-b^{3}$

* **First bracket :** cube root of the first cube – cube root of the second cube.
* **Second bracket :** Use the values in the first bracket to calculate the second bracket :

(first term)2 + (first term) x (second term) + (second term)2

* $a^{3}-b^{3}=\left(a-b\right)(a^{2}+ab+b^{2})$

Here’s a few worked examples:

Factorise :

1. $8a^{3}+27$
2. $27a^{3}-1$
3. $8x^{6}-125y^{3}$

**Solutions**

1. $8a^{3}+27$

=$(2a+3)(4a^{2}-6a+9)$

1. $27a^{3}-1$

=$(3a-1)(9a^{2}+3a+1)$

1. $8x^{6}-125y^{3}$

=$(2x^{2}-5y)(4x^{4}+10x^{2}y+25y^{2})$

Factorise:

1. $m^{3}+n^{3}$
2. $a^{3}-b^{3}$
3. $64p^{6}-27$
4. $125x^{3}+27$