

Be careful:

$$(a + b)^2 \neq a^2 + b^2$$

$$(a + b)^3 \neq a^3 + b^3$$

You can plug specific numbers to see that. Ex $(1 + 2)^2 = 9 \neq 1^2 + 2^2$

The following 7 identities are very often used. Let's try to be familiar with them.

(i) $(a + b)^2 = a^2 + 2ab + b^2$

(ii) $(a - b)^2 = a^2 - 2ab + b^2$

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

(iv) $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

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

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

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