

$$a^n \cdot a^m = a^{n+m}$$

$$a^n \cdot b^n = (a \cdot b)^n$$

$$(a^n)^m = a^{n \cdot m}$$

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

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

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

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc$$

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

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

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

$$(a^n - b^n) = (a-b)(a^{n-1} + a^{n-2}b + a^{n-3}b^2 + \dots + ab^{n-2} + b^{n-1})$$

$$(a^{2k+1} + b^{2k+1}) = (a+b)(a^{2k} - a^{2k-1}b + a^{2k-2}b^2 - a^{2k-3}b^3 + \dots - ab^{2k-2} + b^{2k-1})$$

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