PRODUCTOS NOTABLES

1] Suma por diferencia.

i) fórmula general. Sean p, q pares, entonces: $\boxed{M^p - N^q = (M^{p/2} + N^{q/2})(M^{p/2} - N^{q/2})}$

ii) fórmula particular. $\boxed{M^2 - N^2 = (M+N)(M-N)}$

2] Suma de Cuadrados, Cubos, ... , etc.

$$\begin{aligned}
a^1 + b^1 &= a + b \\
a^2 + b^2 &= \text{no es posible separar en esta forma!!} \\
a^3 + b^3 &= (a+b)(a^2 - ab + b^2) \\
a^4 + b^4 &= \text{no es posible separar en esta forma!!} \\
a^5 + b^5 &= (a+b)(a^4 - a^3b + a^2b^2 - ab^3 + b^4) \\
a^6 + b^6 &= \text{no es posible separar en esta forma!!} \\
a^7 + b^7 &= (a+b)(a^6 - a^5b + a^4b^2 - a^3b^3 + a^2b^4 - ab^5 + b^6) \\
\vdots \quad & \quad \vdots \qquad \vdots \qquad\qquad \vdots \qquad\qquad \vdots
\end{aligned}$$

$$\boxed{a^n + b^n = (a+b)(a^{n-1} - a^{n-2}b + a^{n-3}b^2 - a^{n-4}b^3 + \ \ldots\ - ab^{n-2} + b^{n-1}) \quad , \ \forall n \text{ impar}}$$

3] Diferencia de Cuadrados, Cubos, ... , etc.

$$\begin{aligned}
a^1 - b^1 &= a - b \\
a^2 - b^2 &= (a-b)(a+b) \\
a^3 - b^3 &= (a-b)(a^2 + ab + b^2) \\
a^4 - b^4 &= (a-b)(a^3 + a^2b + ab^2 + b^3) \\
a^5 - b^5 &= (a-b)(a^4 + a^3b + a^2b^2 + ab^3 + b^4) \\
a^6 - b^6 &= (a-b)(a^5 + a^4b + a^3b^2 + a^2b^3 + ab^4 + b^5) \\
a^7 - b^7 &= (a-b)(a^6 + a^5b + a^4b^2 + a^3b^3 + a^2b^4 + ab^5 + b^6) \\
\vdots \quad & \quad \vdots \qquad \vdots \qquad\qquad \vdots \qquad\qquad \vdots
\end{aligned}$$

$$\boxed{a^n - b^n = (a-b)(a^{n-1} + a^{n-2}b + a^{n-3}b^2 + a^{n-4}b^3 + \ \ldots\ + ab^{n-2} + b^{n-1}) \quad , \ \forall n \in \mathbb{N}}$$

4] Cuadrados, Cubos, ... , etc. de un binomio.

			"Triángulo de Pascal"
$(a \pm b)^0$	$= 1$	$\longleftarrow$	1
$(a \pm b)^1$	$= a \pm b$	$\longleftarrow$	1 1
$(a \pm b)^2$	$= a^2 \pm 2ab + b^2$	$\longleftarrow$	1 2 1
$(a \pm b)^3$	$= a^3 \pm 3a^2b + 3ab^2 \pm b^3$	$\longleftarrow$	1 3 3 1
$(a \pm b)^4$	$= a^4 \pm 4a^3b + 6a^2b^2 \pm 4ab^3 + b^4$	$\longleftarrow$	1 4 6 4 1
$(a \pm b)^5$	$= a^5 \pm 5a^4b + 10a^3b^2 \pm 10a^2b^3 + 5ab^4 \pm b^5$	$\longleftarrow$	1 5 10 10 5 1
$(a \pm b)^6$	$= a^6 \pm 6a^5b + 15a^4b^2 \pm 20a^3b^3 + 15a^2b^4 \pm 6ab^5 + b^6$	$\longleftarrow$	1 6 15 20 15 6 1
$(a \pm b)^7$	$= a^7 \pm 7a^6b + 21a^5b^2 \pm 35a^4b^3 + 35a^3b^4 \pm 21a^2b^5 + 7ab^6 \pm b^7$	$\longleftarrow$	1 7 21 35 35 21 7 1
$\vdots$	$\vdots \qquad \vdots \qquad\qquad \vdots \qquad\qquad \vdots$		$\vdots$

$$\boxed{(a \pm b)^n = a^n \pm na^{n-1}b + \frac{n(n-1)}{1\cdot 2}a^{n-2}b^2 \pm \frac{n(n-1)(n-2)}{1\cdot 2\cdot 3}a^{n-3}b^3 + \frac{n(n-1)(n-2)(n-3)}{1\cdot 2\cdot 3\cdot 4}a^{n-4}b^4 \pm \ \ldots\ + (-1)^n b^n}$$

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