

$$\begin{aligned}
 (a+b)^2 &= a^2 + 2ab + b^2 \\
 (a+b)^3 &= (a+b)(a^2 + 2ab + b^2) \\
 &= a^3 + 2a^2b + 3ab^2 + b^3
 \end{aligned}$$

$$\begin{aligned}
 (a+b)^4 &=? \\
 (a+b)^5 &=? \\
 (a+b)^6 &=?
 \end{aligned}$$

Theorem 1:

$$(a+b)^n = \sum_{k=0}^n \binom{n}{k} a^{n-k} b^k$$

$\binom{n}{k} = \frac{n!}{k!(n-k)!}$

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

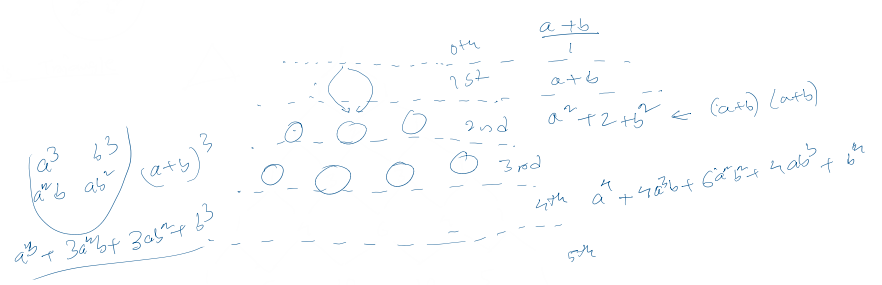
$$\begin{aligned}
 \binom{3}{0} &= \frac{3!}{0!(3-0)!} = \frac{3!}{3!} = 1 \\
 \binom{3}{1} &= \frac{3!}{1!(3-1)!} = \frac{3!}{1!2!} = \frac{3 \cdot 2 \cdot 1}{2 \cdot 1} = 3
 \end{aligned}$$

$$\underline{(a+b)^4 = ?}$$

$$\binom{4}{3} a^{4-3} b^3 = 4ab^3$$

$$\binom{4}{4} a^{4-4} b^4 = b^4$$

$$a^4 b^4 \quad 0^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$$



$$\begin{aligned}
 (a+b)^2 &= (a+b)(a+b) \\
 &= a^2 + 2ab + b^2
 \end{aligned}$$



Q? $(a+b)^5$

coef of ab^4

$$\underline{(a+b)^6 = ?}$$



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