

1						
1	1					
1	2	1				
1	3	3	1			
1	4	6	4	1		
1	5	10	10	5	1	
1	6	15	20	15	6	1

$$\begin{aligned}
 (a + 2b)^4 &= a^4 + 4a^3(2b) + 6a^2(2b)^2 + 4a(2b)^3 + (2b)^4 \\
 &= a^4 + 8a^3b + 24a^2b^2 + 32ab^3 + 16b^4 \\
 (2a - b)^5 &= (2a)^5 - 5(2a)^4b + 10(2a)^3b^2 - 10(2a)^2b^3 + 5(2a)b^4 - b^5 \\
 &= 32a^5 - 8a^4b + 80a^3b^2 - 40a^2b^3 + 10ab^4 - b^5
 \end{aligned}$$

$$\begin{aligned}
 \left(a + \frac{1}{a}\right)^6 &= a^6 + 6a^5 \cdot \frac{1}{a} + 15a^4 \cdot \frac{1}{a^2} + 20a^3 \cdot \frac{1}{a^3} + 15a^2 \cdot \frac{a}{a^4} + 6a \cdot \frac{1}{a^5} + \frac{1}{a^6} \\
 &= a^6 + 6a^4 + 15a^2 + 20 + 15 \frac{1}{a^2} + 6 \cdot \frac{1}{a^4} + \frac{1}{a^6} \\
 \left(a - \frac{1}{a}\right)^6 &= a^6 - 6a^5 \left(\frac{2}{a}\right) + 15a^4 \left(\frac{2}{a}\right)^2 - 20a^3 \left(\frac{2}{a}\right)^3 + 15a^2 \left(\frac{2}{a}\right)^4 - 6a \left(\frac{2}{a}\right)^5 + \left(\frac{2}{a}\right)^6 \\
 &= a^6 - 12a^4 + 60a^2 - 160 + 120 \cdot \frac{1}{a^2} - 192 \cdot \frac{1}{a^4} + 64 \cdot \frac{1}{a^6}
 \end{aligned}$$

إعداد الأستاذ : عبد الخالق آيت علي