Maths IB$_1$

Pre - test 2a

Factorial, binomial coefficient, Pascal Triangle...

Tuesday 1.10.2024

Exercise 1

We define the binomial coefficient, written $\binom{n}{r}$ or ${}^nC_r$

by : $\boxed{\binom{n}{r} = \frac{n!}{(n-r)!r!}}$

Exercise 2

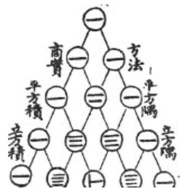
Complete the following table of $\binom{n}{r}$

$n \backslash r$	0	1	2	3	4	5	6
0							
1							
2							
3							
4							
5							


Omar Khayyam (خيام) 1048-1131

Yang Hui (謙光) 1238–1298

Blaise Pascal 1623-1662

Exercise 3

Complete the following

$(a+b)^0 = \boxed{1}$

$(a+b)^1 = a+b = \boxed{1}a + \boxed{1}b$

$(a+b)^2 = a^2 + 2ab + b^2 = \boxed{1}a^2 + \boxed{2}ab + \boxed{1}b^2$

$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 = \boxed{1}a^3 + \boxed{3}ab^2 + \boxed{3}a^2b + \boxed{1}b^3$

$(a+b)^4 = a^4 + \quad a^{\cdots}b + \quad a^{\cdots}b^{\cdots} + \quad a^{\cdots}b^{\cdots} + b^{\cdots} = \boxed{}a + \boxed{}ab + \boxed{}ab + \boxed{}ab + \boxed{}b$

Exercise 4

1) Complete : $(a+b)^n = \binom{n}{0} a^n +$ $\qquad\qquad +$ $\qquad\qquad +$ ...... $+$

2) Write an expression for $(a+b)^n$ using the *sigma* ($\sum$) notation.

$$\boxed{\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad}$$

Exercise 5

1) Find the *term* in x^2 in the expansion of $(x+1)^4$

2) Find the *term* in x^3 in the expansion of $(2x+1)^5$

3) Find the *term* in x^3 in the expansion of $\left(2x-\frac{1}{2}\right)^5$

4) Find the *term* in x^4 in the expansion of $(x-a)^6$

5) Find the *coefficient* of x^4 in the expansion of $(x-a)^6$