

FE:

50 mc	1 mark @	= 50 marks
7 written	2-5	= 25 marks
		<u>75</u>
		<u><u>75</u></u>

64/65
13-15
written

1/2	Transformations	15%
3	Polynomial f ⁿ	15%
4/5/6	Trig	30%
7/8	LOGS	20%
10	functions	10%
11	Combinatorics	10%

1_0C_0
 $1_1C_0 \quad 1_1C_1$
 $1_2C_0 \quad 2_2C_1 \quad 1_2C_2$
 $1_3C_0 \quad 3_3C_1 \quad 3_3C_2 \quad 1_3C_3$
 1 4 6 4 1
 1 5 10 10 5 1
 Row 20
 term 7 $19C_6$

(Note: In the original image, the term 3 in the third row is circled in blue, and an arrow points from the circled 3 to the text "4 row 3rd term".)

The Binomial Theorem

For any whole number "n",

$$(a+b)^n = \underbrace{{}^n C_0 a^n b^0}_{\text{1st term}} + \underbrace{{}^n C_1 a^{n-1} b^1}_{\text{2nd term}} + \underbrace{{}^n C_2 a^{n-2} b^2}_{\text{3rd term}} + \dots$$

$$\rightarrow \underbrace{{}^n C_k a^{n-k} b^k}_{\text{(k+1)th term}} + \dots + {}^n C_n a^0 b^n$$

↓
(k+1)th term

To Find the expansion of the (k+1)th term:
 $t_{k+1} = {}^n C_k a^{n-k} b^k$

Examples:

① Find the 4th term of $(x-3)^9$

$$t_4 = {}^9 C_3$$

$$a = x$$

$$b = (-3)$$

$$n = 9$$

$$k = 3$$

$$\begin{aligned} t_4 &= {}^9 C_3 (x)^6 (-3)^3 \\ &= \underline{84} \cdot x^6 \cdot \underline{(-27)} \\ &= -2268x^6 \end{aligned}$$

② Find the 5th term of $(2x-3y)^{16}$

$$t_5 = {}^{16} C_4 a^{16-k} b^k$$

$$a = 2x$$

$$b = -3y$$

$$n = 16$$

$$k = 4$$

$$\begin{aligned} t_5 &= {}^{16} C_4 (\underline{2x})^{12} (\underline{-3y})^4 \\ &= \underline{1820} \cdot \underline{4096} x^{12} \cdot \underline{(81)} y^4 \\ &= 603\,832\,320 x^{12} y^4 \end{aligned}$$

WRITE THE FIRST 4 TERMS OF

$$(x - 2y)^{12}$$

$${}_{12}C_0(x)^{12}(-2y)^0 + {}_{12}C_1(x)^{11}(-2y)^1 + {}_{12}C_2(x)^{10}(-2y)^2 + {}_{12}C_3(x)^9(-2y)^3$$

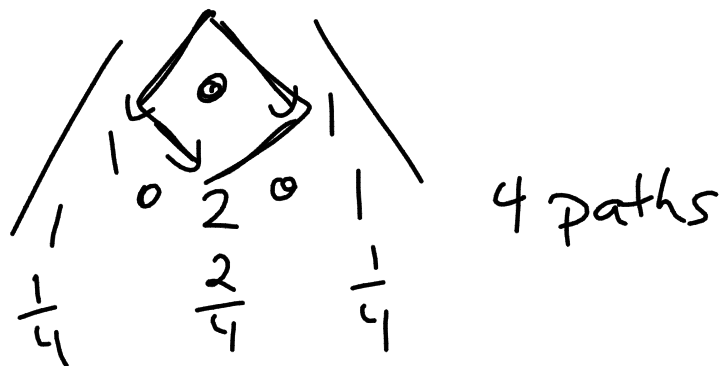
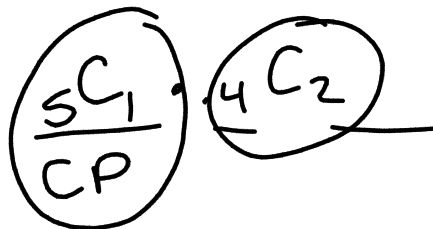
$$\begin{array}{ccccccc} \downarrow & \downarrow & \downarrow & & \downarrow & & \downarrow \\ 1 \cdot x^{12} \cdot 1 & + & 12(x^{11})(-2y) & + & 66x^{10} \cdot 4y^2 & - & 1760x^9y^3 \end{array}$$

$$x^{12} - 24x^{11}y + 264x^{10}y^2 - 1760x^9y^3$$

6.6 Ta Da!

CONGRATS!

5 people



$$10P_3$$

$$12FC$$

$$6R \underline{6B}$$

Choose 4
at least 2R?

$$2R \text{ and } 2B \quad \text{OR} \quad 3R \text{ and } 1B \quad \text{OR} \quad 4R$$

$$\downarrow \downarrow \downarrow \quad \downarrow \quad \downarrow$$

$$6C_2 \cdot 6C_2 \quad + \quad 6C_3 \cdot 6C_1 \quad + \quad 6C_4 \cdot \cancel{6C_0}$$

<u># of Terms</u>	<u>binomial</u>	<u>Expansion</u>
1	$(a+b)^0$	$= 1$
2	$(a+b)^1$	$= 1a + 1b$
3	$(a+b)^2$	$= 1a^2 + 2ab + 1b^2$
4	$(a+b)^3$	$= 1a^3 + 3a^2b + 3ab^2 + 1b^3$
5	$(a+b)^4$	$= 1a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + 1b^4$
	$(a+b)^5$	$= 1a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + 1b^5$