

④ What is the coefficient of xy^2z^2w in the expansion of $(x+y+z+2w)^6$?

The coefficient of $\binom{6}{1221}xy^2z^2w$ is $\frac{6!}{2!2!1!1!} = 360$

360

⑤ A code is being written using the letters a, b, c, d. How many 6 digit codewords are there which use each letter at least once?

There are $\binom{6}{3111} = 120$ words made using 3 a's 1b 1c 1d

There are $\binom{6}{2211} = 180$ words made using 2a's 2b's 1c 1d

ans = $4(120) + 6(180) = 1560$



There are 4 ways to choose 1 letter from 4 letters.



There are 6 ways to choose 2 letters from 4 letters