

1. Repetition: the number of binary words of length n with k ones. Proof of binomial theorem via bijection.
2. Repetition: the number of words of length n over alphabet $1, 2, \dots, m$ with k_1 ones, k_2 twos, ..., k_m m -ths. Proof of multinomial theorem via bijection.
3. Distributing candies among children: count the number of solutions (in nonnegative integers) of the equation

$$x_1 + x_2 + \dots + x_k = n.$$

4. Repetition (but in other words): the number of distributions of
 - n students to k courses
 - n students to k elective courses (a student can take no elective courses)
5. Distributions in terms of functions
6. Domain and range
7. Image and preimage (inverse image)

References

The books are listed on the wiki-page.

[1]: Section 3.4

[3]: Section 4.1

[4]: Sections 2.8.6-2.8.7, 6.1, 6.2, 6.4, 6.6