Solutions with explanations.

Page 71, #1. Albert can take or not take the first fruit. He can take or not take the second fruit.

⋮

etc. up to the 7th fruit.

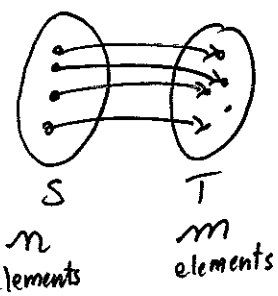
Seven steps, two choices each. So there are 2^7 possible orders.

Page 72, #2 Virgina must decide for each of the bills whether to include it in the gift. There are no two combinations that yield the same sum — one can check explicitly. So there are 2^5 choices, since there are 5 bills. But if the choice "nothing for you, Brian" is not permitted, there are $2^5 - 1 = 31$ choices.

P47, #27. There are 11 floors for each passenger to choose from. So there are 11^8 ways for the passengers to leave the elevator. If each passenger must get off on a different floor, then the first has 11 choices, the second 10, and so on. So there are $(11)(10)(9)(8)(7)(6)(5)(4)$ ways to get off on all different floors.

$$P(\text{everyone gets off on different floor}) = \frac{11!}{3!} \cdot \frac{1}{11^8}$$

p52 # 24.



a) Each of the n elements of S may be sent to any one of the m elements of T. So there are m^n possibilities.

b) There are m choices for the first element of S, m-1 choices for the second, etc. So, there are $(n)(n-1)(n-2)\cdots(n-m+1)$ choices. This number is $\frac{n!}{(n-m)!}$.

c) If S & T have the same number of elements, a function is surjective iff it's injective. So, by b) the number is $n!/0! = n!$