Answer on Question #59917 – Math – Statistics and Probability

Question

6. In how many ways can a committee of 3 people be chosen out of 8 people?

Solution

Using the formula of the number of combinations we obtain $C_8^3 = \frac{8!}{3!\cdot 5!} = 56.$

Answer: 56 ways.

Question

7. A coin is rolled thrice, what is the event that two heads occur?

Answer: The required event has the next form: $\{HHT,\ HTH,\ THH\}$, where H is head, and T is tail.

Question

8. What is the number of possible outcomes assumed to be equally likely if a coin is tossed thrice?

Solution

The possible outcomes are $\{HHH, HHT, HTH, THH, TTT, TTH, THT, HTT\}$. There are 8 outcomes.

Answer: 8.

Question

9. Write down the sample space for a box containing 6 items of which 2 are defective. One item is chosen one after the other without replacement until the last defective item is chosen.

Solution

Let N be the non-defective item, and D be the defective item. Then the sample space has the next form:

$$DD, NDD, DND, NNDD, NDND, DNND, NNNDD, NNDND, NDNND, DNNND, NNNNDD,$$

$$NNNDND, NNDNND, NDNNND, DNNNND, NNNNNDD, NNNNDND, NNNDNND, NNDNNND,$$

$$NDNNNND, DNNNNND, NNNNNNDD, NNNNNDND, NNNNDNND, NNNDNNND, NNDNNNND,$$

$$NDNNNNND, DNNNNNND.$$

Question

10. In how many ways can 12 objects be split into three groups containing 2, 4 and 6 objects?

Solution

Using the formula of the number of combinations and the formula of multiplication we obtain: $C_{12}^{2} \cdot C_{10}^{4} \cdot C_{6}^{6} = \frac{12!}{2! \cdot 10!} \cdot \frac{10!}{4! \cdot 6!} \cdot 1 = 13860.$

Answer: 13860 ways.