Answer on Question #58950 – Math – Statistics and Probability

Question

1. If a woman has 10 blouses, 6 skirts and 4 pairs of shoes, in how many ways can she choose two dresses and two pairs of shoes assuming any combination of blouse, skirt and pair of shoe matches

Solution

Dress consists of a blouse and skirt. Any woman cannot wear only skirt or blouse. So, owe have four items in total.

The first blouse, skirt and pair of shoe can be chosen in

$$10 \cdot 6 \cdot 4 = 240\ ways.$$

The second blouse, skirt and pair of shoe can be chosen in

$$9 \cdot 5 \cdot 3 = 135\ ways.$$

The total number of ways is

$$240 \cdot 135 = 32400$$

Answer: 32400.

Question

2. Let A and B be any two events defined on the same sample space. Suppose P(A) = 0.3 and P(A U B) = 0.6. Find P(B) such that A and B are mutually exclusive.

Solution

$$\mathrm{P(B)} = \mathrm{P(A\ U\ B)} - \mathrm{P(A)} = 0.6 - 0.3 = 0.3.$$

Answer: 0.3.

Question

3. A group of students consist of 4 men, 6 women and 5 transgender. The students are ranked according to their performance in a quiz competition. Assuming no two students obtain the same score, how many ranking are possible if each category of students are ranked among themselves?

Solution

There are $4! = 24$ possible rankings of the men, and $6! = 720$ possible rankings of the women and

$5! = 120$ possible rankings of the transgender. It follows from the fundamental principle of counting that there are

$$4! \cdot 6! \cdot 5! = 24 \cdot 720 \cdot 120 = 2073600 \text{ possible rankings.}$$

Answer: 2073600.

Question

4. A certain shop repairs both audio and video components. Let A denote the event that the next component brought in for repair is an audio component, and let B be the event that the next component is a compact disc player (so the event B is contained in A). Suppose that P(A)= 0.6 and P(B) =0.05. What is P(B|A)?

Solution

$P(B|A) = \frac{\mathrm{P(B)}}{\mathrm{P(A)}} = \frac{0.05}{0.6} = \frac{1}{12} \approx 0.0833.$

Answer: $\frac{1}{12} \approx 0.0833.$