

Answer on Question #45934, Math, Statistics and Probability

A planning committee for a major development project must consist of four architects, three engineers and one environmental lawyer. There are six architects, five engineers and 3 environmental lawyers available to choose from. How many different combinations of the committee can be formed (rounded off to zero decimals)?

Twenty prominent citizens have been nominated for a 'Community Citizen of the Year' award. First- and second-place trophies are awarded to the two persons receiving the highest and second highest number of votes. In how many different ways can the first and second place trophies be awarded (rounded off to zero decimals)?

Solution

1. So first we find how many ways group of 4 architects can be picked from 6:

$$C_6^4 = \frac{6 \cdot 5 \cdot 4 \cdot 3}{4 \cdot 3 \cdot 2 \cdot 1} = 15$$

Then we find how many ways group of 3 engineers can be picked from 5:

$$C_5^3 = \frac{5 \cdot 4 \cdot 3}{3 \cdot 2 \cdot 1} = 10$$

Then we find how many ways group of 1 lawyer can be picked from 3:

$$C_3^1 = 3$$

And now we multiply all together to find number of possible combined groups:

$$15 \cdot 10 \cdot 3 = 450$$

2. How many ways to take 2 from 20?

$$C_{20}^2 = \frac{20 \cdot 19}{2 \cdot 1} = 190$$

Answer is 190 different ways.