Answer on Question #48410 – Math – Statistics and Probability

Question. We have 20 jurors for atrial, 12 favor punishment, 8 don't favor punishment, if 12 jurors are selected at random from the 20 jurors, what is the probability that 7 of them will not favor punishment?

Solution.

We must select 7 jurors from 8 (they don't favor punishment). We can do it in C_8^7 ways.

Now we must select 5 jurors from 12 (they favor punishment). We can do it in C_{12}^5 ways.

Using the multiplication rule and assumption that 7 from 12 will not favor punishment and 5 jurors from 12 favor punishment, the number of favorable outcomes is $C_8^7 \cdot C_{12}^5$.

If 12 jurors are selected at random from the 20 jurors, the number of all outcomes is C_{20}^{12}.

The required probability is equal to $\frac{C_8^7 \cdot C_{12}^5}{C_{20}^{12}} = \frac{8!}{7!} \cdot \frac{12!}{5! \cdot 7!} \cdot \frac{12! \cdot 8!}{20!} = \frac{1056}{20995}$.

Answer. $\frac{1056}{20995}$.