

Answer on Question #49169 – Math – Statistics and Probability

According to a reactor ding to government data, the probability that an adult was never in a museum is 15%. In a random survey of 10 adults, what is the probability that at least eight were in a museum?

Solution

We use Bernoulli formula to calculate the following probability:

$$P_n(k) = \frac{n!}{k!(n-k)!} p^k q^{n-k} \quad \text{or} \quad P_n(k) = C_n^k p^k q^{n-k}$$

In our case, $p = 0.85$, $q = 0.15$.

The probability that at least eight were in a museum is

$$P = P_{10}(8) + P_{10}(9) + P_{10}(10) =$$

$$= 45 * 0.85^8 * 0.15^2 + 10 * 0.85^9 * 0.15 + 1 * 0.85^{10} * 1 = 0.82 \text{ or } 82\%.$$