**Answer on Question #44150 – Math - Statistics and Probability**

The probability of success in an experiment is p = 0.1. If the experiment is conducted 7 times, what is the probability that 3 or less will end in success?

**Solution**

Assume that trials are independent. Let the random variable X denote the number of successes among 7 trials. Hence X has a binomial distribution with $n = 7$ and p = 0.1.

We calculate probability

$$P(X \leq 3) = P(X = 0) + P(X = 1) + P(X = 2) + P(X = 3) =$$

$$= \binom{7}{0}(0.1)^0(0.9)^7 + \binom{7}{1}(0.1)^1(0.9)^6 + \binom{7}{2}(0.1)^2(0.9)^5 + \binom{7}{3}(0.1)^3(0.9)^4 =$$

$$= (0.9)^7 + 7 * 0.1(0.9)^6 + 21(0.1)^2(0.9)^5 + 35(0.1)^3(0.9)^4 \approx 0.997,$$

where $\binom{n}{k} = \frac{n!}{k!(n-k)!}$, $n! = 1 \times 2 \times ... \times n$.

**Answer:** 0.997.