

## Answer on Question #62732 – Math – Statistics and Probability

### Question

In a certain rabbit farm in the southern part of Nigeria 25% of the rabbits breed are of the type bauscat, determine the probability that out of 5 rabbits chosen at random 2 are of the type bauscat.

### Solution

Let  $p$  mean the probability that the random chosen rabbit has the type bauscat (called a probability of the success).

The problem deals with the binomial distribution with parameters

$$n = 5, p = 0.25.$$

Then the probability of getting exactly  $k$  successes in  $n$  trials is given by the formula

$$P_n(k) = \binom{n}{k} p^k (1 - p)^{n-k}$$

Hence, the probability that out of 5 rabbits chosen at random 2 are of the type bauscat is

$$P_5(2) = \binom{5}{2} \times 0.25^2 \times 0.75^{5-2} = \frac{5!}{2!3!} \times 0.25^2 \times 0.75^3 \approx 10 \times 0.0625 \times 0.4219 \approx 0.26,$$

where  $k! = 1 \times 2 \times \dots \times k$ .

**Answer:** 0.26.