Answer on Question #81861 – Math — Statistics and Probability

Question

Suppose you just received a shipment of twelve televisions. Two of the televisions are defective. If two televisions are randomly selected, compute the probability that both televisions work. What is the probability at least one of the two televisions does not work?

Solution

Two televisions can be selected in $\binom{12}{2}$ ways. Two working televisions can be selected in $\binom{10}{2}$. Then the probability of A={both televisions work} is

$$P(A) = \frac{\binom{10}{2}}{\binom{12}{2}} = \frac{\frac{10!}{2!\,8!}}{\frac{12!}{2!\,10!}} = \frac{9*10}{11*12} = 0.6818.$$

The probability that at least one of the two televisions does not work is $P(\bar{A}) = 1 - P(A) = 1 - 0.6818 = 0.3182.$

Answer: 0.6818, 0.3182.