Question

Suppose you just received a shipment of seven 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

Since two of the televisions are defective, 5 TV should be in good quality. Then the probability that both televisions work (none of the two television are defective) would be

$$P(\text{both work}) = \frac{5}{7} \cdot \frac{5-1}{7-1} = \frac{10}{21}$$

The probability at least one of the two televisions does not work

$$P(\text{at least one TV is defective}) = 1 - P(\text{both work}) = 1 - \frac{10}{21} = \frac{11}{21}$$

Answer: $\frac{10}{21}; \frac{11}{21}.$