Answer on Question #58264 – Math – Statistics and Probability

Question

An automatic gate has a 95% chance of working on any particular day. Find the probability that it will be working on at least one of the next two days.

Solution

Let "W" represent the event when the gate works on specific day;

$$P(W) = 0.95.$$

The complement of event W is the event N, which means that the gate does not work on specific day;

$$P(N) = 1 - P(W) = 0.05.$$

Let "W1+" represent the event when the gate works at least 1 of 2 days.
The complement of event W1+ is N2, which means that the gate does not work on both days:

$$P(W1+) = 1 - P(N2)$$

The probability of the gate not working on both days is given by

$$P(N2) = P(N) \times P(N) = P^2(N)$$

Therefore:

$$P(W1+) = 1 - P^2(N);$$

$$P(W1+) = 1 - 0.05^2 = 0.9975.$$

Answer: the probability that the gate will be working on at least one of two days is 0.9975.