

Answer on Question #49891 - Math - Statistics and Probability

The probability that a doctor successfully performs an operation is 80%. what is the probability that at least 3 operations out of 4 conducted by him will be successful?

Solution.

Let A = "doctor successfully performs an operation". Then $P(A) = 0.8$ is probability of success and $P(\bar{A}) = 1 - P(A) = 1 - 0.8 = 0.2$ is probability of failure.

Define B = "at least 3 operations out of 4 conducted by doctor will be successful".

Event B consists of two parts. In the first one, 3 operations are successfully performed and one unsuccessful, where unsuccessful operation can be first, second, third or fourth. In the other one, all of 4 conducted operations are successful. In both cases we use binomial distribution.

Thus the probability of B is $P(B) = (0.8)^3(0.2)4 + (0.8)^4 = 0.8192$

Answer: the probability that at least 3 operations out of 4 conducted by doctor will be successful is 0.8192.