Answer on Question #45519 – Math – Statistics and Probability

Question:

An anti – aircraft gun can take a maximum of 4 shots at an enemy plane moving away from it. The probabilities of hitting the plane at the first, second, third and fourth shot are 0.4, 0.3, 0.2 and 0.1 respectively. The probability that the gun hits the plane is

Solution:

Probability that the gun hits the plane equals:

$$P = 1 - P_n \,,$$

where P_n is probability that gun doesn't hit the plane,

$$P_n = P_{n1}P_{n2}P_{n3}P_{n4} \,,$$

where $P_{n1},\ P_{n2},\ P_{n3},\ P_{n4}$ are probabilities that gun doesn't hit the plane at the first, second, third and fourth shot.

$$P_{ni} = 1 - P_i$$

where P_i is probability that gun hit the plane at i shot.

Therefore:

$$\begin{aligned} P &= 1 - (1 - P_1)(1 - P_2)(1 - P_3)(1 - P_4) \\ &= 1 - (1 - 0.4)(1 - 0.3)(1 - 0.2)(1 - 0.1) = 0.7 \end{aligned}$$

Answer: 0.7.