Question # 12024

40% of couples who plan to get married this year are planning destination weddings. In a random sample of 12 couples who plan to marry, find the probability that a) exactly 6 couples will have a destination wedding b) at least 2 couples will have a destination wedding c) fewer than 3 couples will have a destination wedding

Solution. The condition implies that the probability of a destination wedding in a randomly selected couple equals 0.4. Denote by N the number of couples of those 12 that plan to have a destination wedding. Hence, we are to find:

1) $P(N = 6) = C_{12}^6 0.4^6 \cdot 0.6^6 \approx 0.17.$

2) $P(N \geq 2) = 1 - P(N = 1) - P(N = 0) = 1 - C_{12}^1 0.4 \cdot 0.6^{11} - 0.6^{12} \approx 0.98.$

3) $P(N \leq 3) = 0.6^{12} + C_{12}^1 0.4^1 0.6^{12} + C_{12}^2 0.4^2 0.6^{10} + C_{12}^3 0.4^3 0.6^9 \approx 0.22$