

Answer on Question #86255 – Math – Statistics and Probability

Question

The chances that a visit to a primary health centre (PHC) results in neither lab work, nor referred to a specialist is 35%. Out of those coming to a PHC, 30% are referred to a specialist, and 40% require lab work. Find the probability that a visit to a PHC results in both lab work and referral to a specialist.

Solution

Denote

A = 'lab work', B = 'referred to a specialist'

We have:

$$P(\bar{A} \cap \bar{B}) = 0.35, P(A) = 0.3, P(B) = 0.4$$

By inclusion exclusion formula

$$\begin{aligned} P(A \cap B) &= P(A) + P(B) - P(A \cup B) = \\ &= P(A) + P(B) - (1 - P(\bar{A} \cap \bar{B})) = \\ &= 0.3 + 0.4 - (1 - 0.35) = 0.05 \end{aligned}$$

Answer: 0.05.