Answer on question – 39295 – Math – Statistics and probability

A chartered accountant applies for a job in two firms X and Y. He estimates that the probability of his being selected in firm X is 0.7 and being rejected in Y is 0.5 and the probabilty that atleast one of his applications rejected is 0.6. What is the probability that he will be selected in one of the firms?

Solution

Let event X – he will be selected in firm X;

Event Y – he will be selected in firm Y.

Then we have: $P(X) = 0.7,\ P(\bar{X}) = 0.3,\ P(\bar{Y}) = P(Y) = 0.5,\ P(\bar{X} \cup \bar{Y}) = 0.6.$

Using following equalities

$$P(\bar{X} \cup \bar{Y}) = P(\bar{X}) + P(\bar{Y}) - P(\bar{X} \cap \bar{Y}),$$

And

$$P(X \cup Y) = 1 - P(\overline{X \cup Y}) = 1 - P(\bar{X} \cap \bar{Y}).$$

We obtain

$$0.6 = 0.3 + 0.5 - P(\bar{X} \cap \bar{Y}),$$

$$P(\bar{X} \cap \bar{Y}) = 0.2.$$

From the second equality

$$P(X \cup Y) = 1 - 0.2 = 0.8.$$

Answer: 0.8.