Answer on Question #46483 – Math – Statistics and Probability

The police plans to enforce speed limits by using radar traps at different locations within the city limits. The radar traps at each of the location L1 , L2 , L3 , and L4 , are operated 40%, 30%, 20% and 30% of the time. If a person who is speeding on his way to work has probabilities of 0.2, 0.1, 0.5 and 0.2 respectively, of passing through these locations, what is the probability that he will receive a speeding ticket? Also find the probability that he will receive a speeding ticket at location L1 .

Solution:

Finding the probability that he will receive a speeding ticket at location L1:

The probability that he will pass through location L1 is 0.2.To receive a speeding ticket person need to pass through it an time, when radar trap is operate, so it's probability 0.4.Base on independent of those events joint probability is $P(L1) = 0.2 \cdot 0.4 = 0.08$.

Finding the probability that he will receive a speeding ticket by passing through these locations:

Joint probability is the sum of $P = P(L1) + P(L2) + P(L3) + P(L4)$, because those events are mutually exclusive.
Using above mentioned calculating of P(L1), we get :

$P(L2) = 0.1 \cdot 0.3 = 0.03$

$P(L3) = 0.5 \cdot 0.2 = 0.1$

$P(L4) = 0.2 \cdot 0.3 = 0.06$

$P = 0.08 + 0.03 + 0.1 + 0.06 = 0.27$

Answer: The probability that he will receive a speeding ticket by passing through these locations is 0.27. The probability that he will receive a speeding ticket at location L1 is 0.08.