3 a)

Proving that sum of posterior probabilities of k classes equal to one

Considering k classes,

Posterior probabilities are :-

P ( G = 1 | X = x) =

P ( G = 2 | X = x) =

.

.

.

.

.

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P ( G = (k-1) | X = x) =

P ( G = k | X = x) =

Sum of posterior Probabilities for k classes is :-

+ ………. + +

b)

p(x) =

Now we have and