EXAM C QUESTIONS OF THE WEEK

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Week of August 6/07

X is a mixture of a Poisson distributions with means 1, 2 and 3.
The mean of X is 2.1 and the variance of X is 2.59. Find $P(X = 0)$.

The solution can be found below.

Week of August 6/07 - Solution

With mixing weight a applied to the Poisson with mean 1 and mixing weight b applied to the Poisson with mean 2, the mean of X is $E(X) = a + 2b + 3(1 - a - b) = 2.1$.

The second moment of X is $E(X^2) = 2a + 6b + 12(1 - a - b) = 2.59 + 2.1^2 = 7.0$.

We get the two equations $2a + b = .9$ and $10a + 6b = 5$.

Solving these two equations results in $a = .2$ and $b = .5$.

Then $P(X = 0) = .2e^{-1} + .5e^{-2} + .3e^{-3} = .156$.