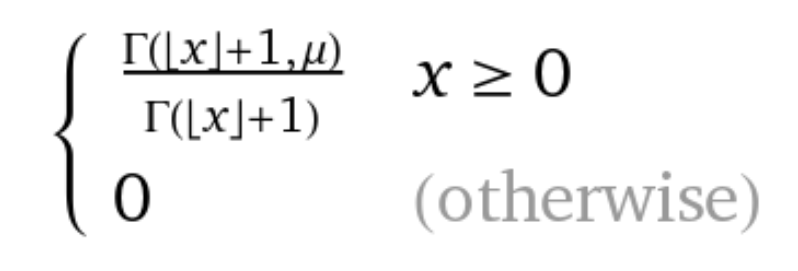


The formulation for the poisson distribution is presented in the following:

**1(a)-** The value for the is considered as 5 as per question 1.

=0.0067 as a result the P(0,5)= **0.6 %**

**1(b)-** at least one cluster means that one or more which is equivalent to 1-Q(1|5) on a cumulative distribution function. The cumulative distribution function (CDF) for the poisson distribution can be calculated as follows:

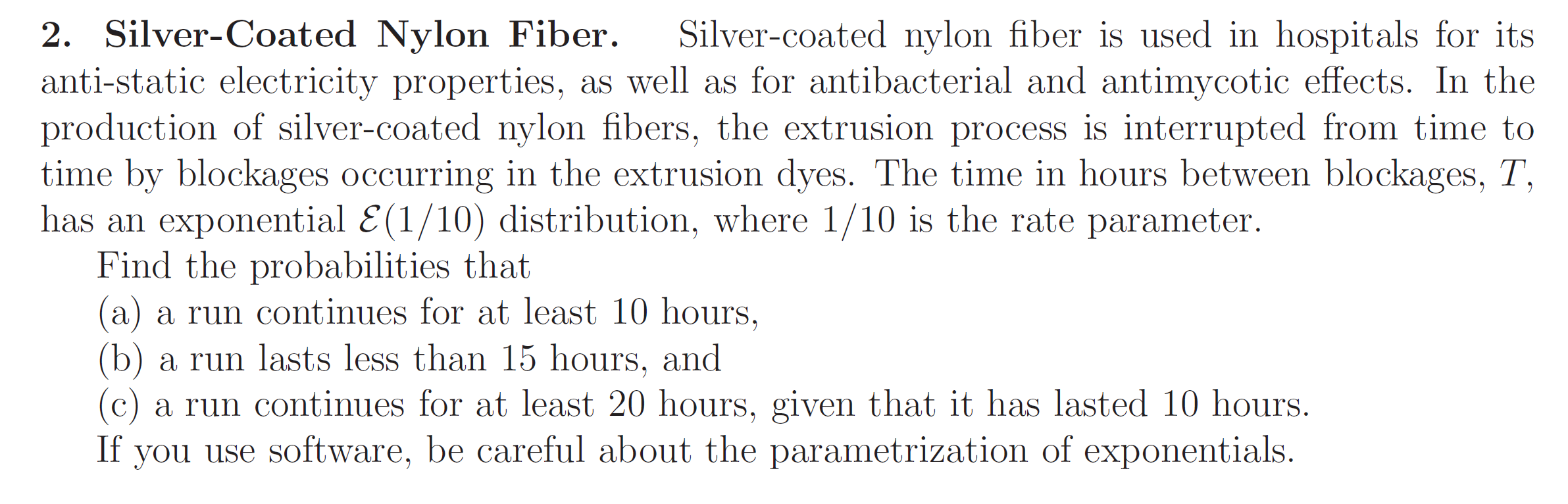


The cumulative density function can be calculated by deducing the 1 from the CDF. The final results will be **95.9%**

**1(c)-** It is possible to calculate the same approach as part (b) by calculating the CDF for 1-Q(8|5):

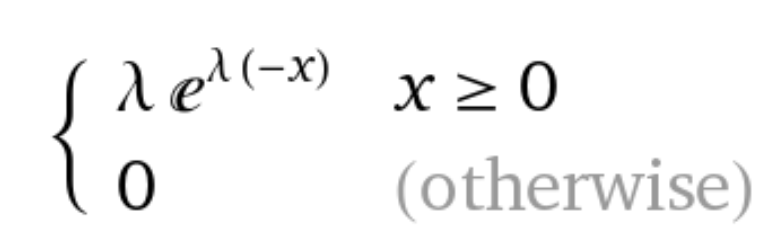
The result will be: (1-0.931) \* 100 = **6.9%**

**1(d)-** Again it is possible to use the cumulative density function, it is mentioned that the results are inclusive so the 76.2%-44.04% which leads to **32.16%**.



**(a):**

It is possible to use the probability density function for the exponential function:



To be able to answer (a): 1-PDF(x=10) = 96.33%

(b):

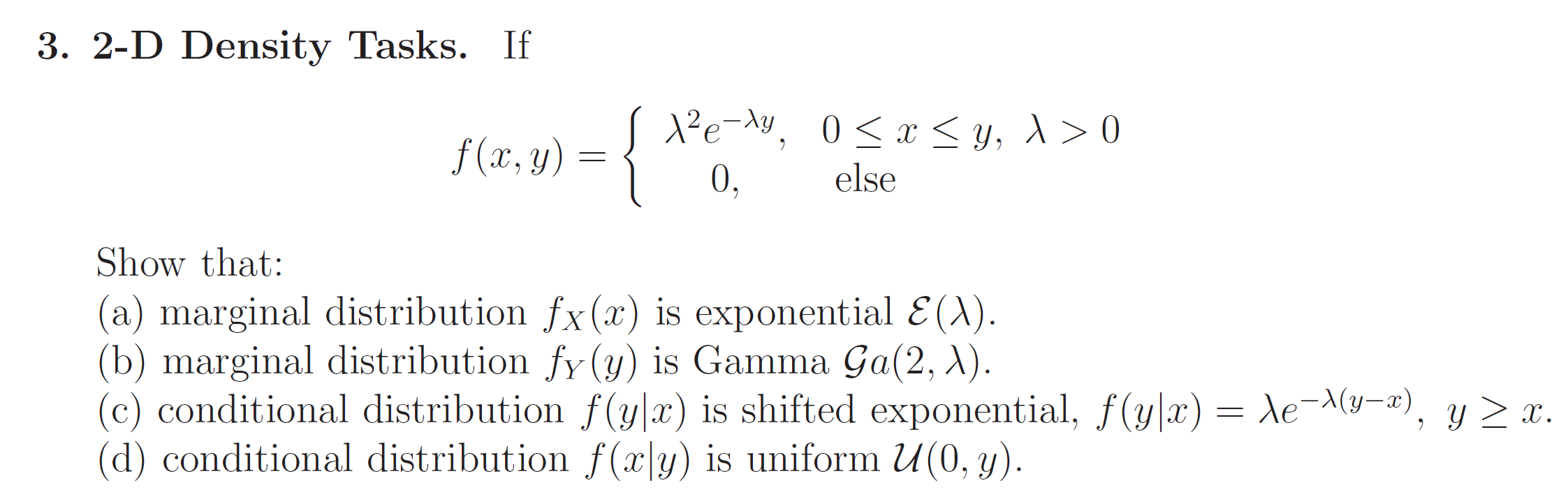
The CDF for the exponential distribution need to be calculated for the X<15:

**77.68%**

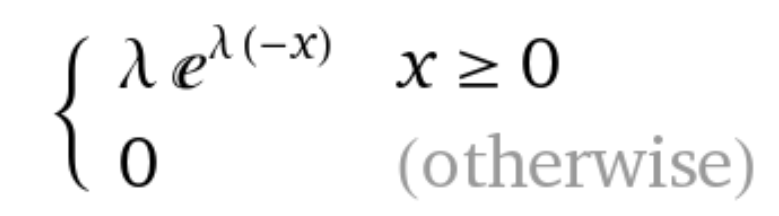
(c):

The conditional probability can be used as follows:

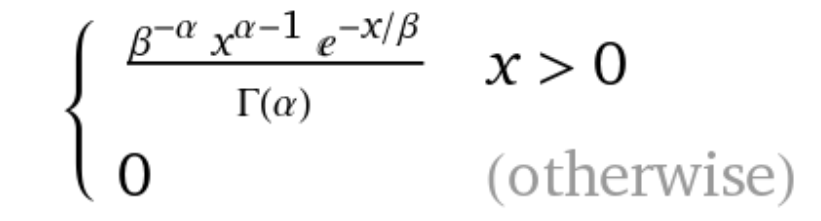
[1- CDF(20)]/[PDF(x=10)] = **0.8975 or 89.75%**



**(a)-** The marginal distribution of is equivalent to which is similar to the exponential distribution:

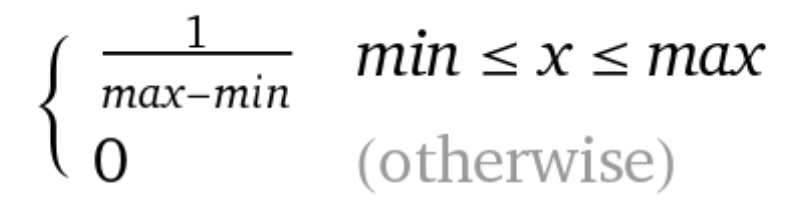


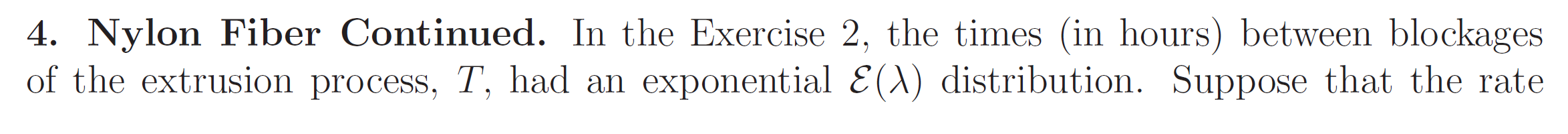
**(b)-** Marginal distribution of is equivalent to which is similar to the gamma distribution:

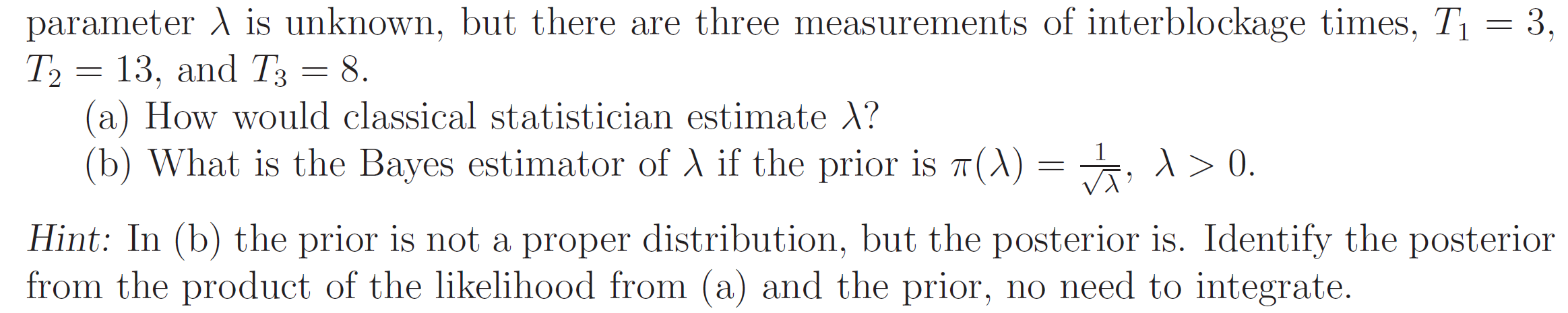


**(c)-** The conditional distribution can be calculated by division of the . The is calculated in section (a). As a result, the

**(d)-**Conditional distribution is uniform. . After calculation and substitution of f(y) from part (b), the result will be presented as follows:

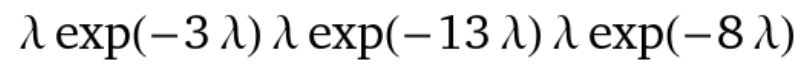






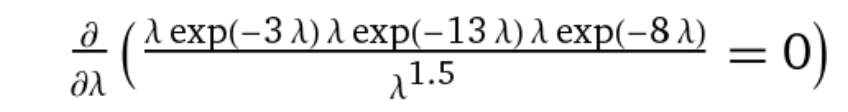
(a)-The formulation for calculating the can be given as:

It is assumed that the probabilities for the three given events are independent.



We consider the differentiate to calculate the maximum.

(b)-



The result will be updated as follows: