

Solution for exercise 30, exercise 1 final exam 8/1-1994

Question 1 This is the probability that an exponential distribution exceeds the value 1, i.e. e^{-1} .

Question 2

$$\frac{\mu}{\mu + \lambda} = 0.9 \Rightarrow \mu = 9$$

Question 3

$$\begin{bmatrix} -1 & 1 & 0 \\ 9 & -10 & 1 \\ 0 & 0 & 0 \end{bmatrix}$$

Question 4 The distribution is a phase type distribution. The exact expression can be found by applying the Laplace transform.

$$(s\mathbf{I} - \mathbf{T})^{-1} = \left(\begin{bmatrix} s+1 & -1 \\ -9 & s+10 \end{bmatrix} \right)^{-1}$$

The Laplace transform is then obtained by

$$(1, 0) \frac{1}{s^2 + 11s + 1} \begin{bmatrix} 0 \\ 1 \end{bmatrix} =$$

By decomposition and inversion of the transform we finally obtain the probability in question which is 0.92.