

Solution for review exercise 1 (chapter 1) in Pitman

Solution for exercise 4.2.5 in Pitman

Question a) The time between two calls in a Poisson process is exponentially distributed (page 289). Using the notation of page 289 with $\lambda = 1$ we get

$$P(W_4 \leq 2) = 1 - e^{-2} = 0.8647$$

Question b) The distribution of the time to the arrival of the fourth call is a Gamma $(4, \lambda)$ distribution. We find the probability using the result (2) on page 286

$$P(T_4 \leq 5) = 1 - e^{-5} \left(1 + 5 + \frac{25}{2} + \frac{125}{6} \right) = 1 - \frac{118}{3} e^{-5} = 0.735$$

Question c)

$$E(T_4) = \frac{4}{\lambda} = 4$$

using (3) page 286.