

Exercise 25 (22/12/98 ex..2)

The banana plantation A/S Chiqchiq lies in a tropical country. The weather in this area changes between wet and dry periods, where the duration of the periods can be described respectively by $f_{\text{dry}}(t)$ and $f_{\text{wet}}(t)$ (density functions).

$$f_{\text{dry}} = \frac{1}{3} \frac{t}{3} e^{-\frac{t}{3}} \quad f_{\text{wet}}(t) = \frac{2}{5} e^{-\frac{1}{2}t} + \frac{1}{110} e^{-\frac{1}{22}t}$$

The time unit is one week.

Question 1

A banana inspector arrives at the plantation at an arbitrary time during a wet period. Determine the probability that she will have to wait more than two weeks for a dry period.

Question 2

Derive an expression for the expected number of dry periods which the inspector will experience during the next 8 weeks.

Question 3

We now define it as an event whenever a new weather period starts. Formulate a mathematical model for the point process of these events.

Question 4

Some meteorologists claim that a more adequate model will be a model with f_{dry} being the distribution of the constant 6 days. Formulate the point process of question 3 with this modified assumption.