

EXAM MLC QUESTIONS OF THE WEEK

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Week of May 14/07

$\{N(t) : t \geq 0\}$ is a nonhomogeneous Poisson process with intensity function $\lambda(t) = \frac{1}{1+t}$.
Find the density function for S_1 , the time that the first event occurs.

The solution can be found below.

Week of May 14/07 - Solution

$$f_{S_1}(s) = \frac{d}{ds} F_{S_1}(s) = -\frac{d}{ds} P[N_1(s) = 0].$$

$$E[N(s)] = \int_0^s \frac{1}{1+t} dt = \ln(1+s) \rightarrow P[N(s) = 0] = \frac{1}{1+s}.$$

$$f_{S_1}(s) = -\frac{d}{ds} P[N(s) = 0] = -\frac{d}{ds} \frac{1}{1+s} = \frac{1}{(1+s)^2}.$$