

1. Let $f(x) = c e^{-\lambda x}$ $x \geq 0$, $\lambda > 0$ for $0 < x < 9$.

a) Find the value of c that makes f a density function for a random variable X .

b) Find the cumulative distribution function for X .

c) Find $P(X > s + t \mid X > s)$

d) Evaluate $\int_0^{\infty} x \lambda e^{-\lambda x} dx$

2. The length of life in hours, X , of an electronic component has an exponential probability density function with mean 500 hours.

a) Find the probability that a component lasts at least 800 hours.

b) Suppose a component has been in operation for 300 hours. What is the probability that it will last another 800 hours?