Question:

The time till failure of an electronic component has an **Exponential distribution** and it is known that 10% of components have failed by 1000 hours.(Say X is the random variable representing time till failure of electronic components) (a)Find **λ** in the formula of exponential distribution PDF (b) What is the probability that a component is still working after 3000 hours? (c) Find the standard deviation of X

Answer:

1. Let X = time till failure of electronic components. Since 10% of them failed before 1000 hours, P(X <= 1000) = 0.1 = 1-e-1000λ => λ = 1.054ⅹ10-4
2. P(X >= 3000) =1-( 1- e-3000λ) = 0.729
3. Variance is $\frac{1}{λ^{2}}$ = 90015806.7. So σ = $\sqrt{\frac{1}{λ^{2}}}$ = 9487.67.