

Exam P 029 (Exponential Distribution)

We are given  $N \sim \text{exponential}(\lambda)$

$$f(x) = \begin{cases} \lambda e^{-\lambda x} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

$$\Rightarrow 0.3 = \int_0^{50} \lambda e^{-\lambda x} dx = -e^{-\lambda x} \Big|_0^{50} = 1 - e^{-\lambda 50}$$

We get  $\lambda = 0.007133$

$$\Rightarrow \text{Prob} = \int_0^{80} \lambda e^{-\lambda x} = 1 - e^{-\lambda(80)} = 1 - e^{-(0.007133)(80)} \quad \boxed{0.43}$$