Problem 69

X: time to failure

\[ X \sim \text{Exponential (} \lambda \text{)} \]

\[ f(x) = \lambda e^{-\lambda x} \quad x > 0 \]

X has a median of 4

\[ 0.5 = \int_0^4 \lambda e^{-\lambda x} \, dx \]

Median: x at which F(x) = 0.5

\[ 0.5 = 1 - e^{-\lambda x} \]

\[ \lambda = 3 \]

\[ p(x > 5) = \int_5^\infty 0.1733 e^{-0.1733 x} \, dx \]

\[ = e^{-0.1733(5)} \]

\[ = 0.42 \]

[D]