

Problem 69

X: time to failure

$X \sim \text{Exponential}(\lambda)$

$$f(x) = \lambda \cdot e^{-\lambda x} \quad x > 0$$

X has a median of 4

$$.5 = \int_0^4 \lambda \cdot e^{-\lambda x} \cdot dx$$

Median: X at which $F(x) = .5$

$$.5 = 1 - e^{-4 \cdot \lambda}$$

$$\lambda = .1733$$

$$p(x > 5) = \int_5^{\infty} .1733 \cdot e^{-.1733x} \cdot dx$$
$$= e^{-.1733(5)}$$

$$= .42$$

.42 D