

46. A device that continuously measures and records seismic activity is placed in a remote region. The time, T , to failure of this device is exponentially distributed with mean 3 years. Since the device will not be monitored during its first two years of service, the time to discovery of its failure is $X = \max(T, 2)$.

Determine $E[X]$.

(A) $2 + \frac{1}{3}e^{-6}$

(B) $2 - 2e^{-2/3} + 5e^{-4/3}$

(C) 3

(D) $2 + 3e^{-2/3}$

(E) 5