Solution HW5

27. (a) $E[\min(X_\lambda, X_\mu)] = E(X_{\lambda+\mu}) = \frac{1}{\lambda+\mu}$.

(b) $E(V-U) = \frac{\lambda}{\lambda+\mu}\left[\frac{1}{\mu} - \frac{1}{\lambda}\right] + \frac{\mu}{\lambda+\mu}\left[\frac{1}{\lambda} - \frac{1}{\mu}\right]$

(c) $EV = \frac{1}{\lambda+\mu} + E(V-U)$. ; $EV = EX_\lambda + EX_\mu - E\min$

$= \frac{1}{\lambda} + \frac{1}{\mu} - \frac{1}{\lambda+\mu}$

2.10 By memoryless property

(a) $\max(A, B) + C = \frac{1}{8} + \frac{1}{4}$ (b) $E\left[\max(A,B) + \max(C, \max - \min)\right]$

$= \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{8} = 5/8$

(c) $\frac{1}{2}$

2.21 $25(.01) = .25 = \lambda$.

Ans: $e^{\lambda} + e^{-\lambda}\lambda$

2.22 (a) $E T_{12} = \frac{12}{3}$ (b) $E[T_{12} - T_6] + E[T_6 - 2 \mid N(2) = 5] + 2$

$= 2 + \frac{6}{3} + \frac{1}{3} = 7/3 + 2$

(c) $E(N(5) - N(2)) + 5 = 3 \cdot 3 + 5$.

2.24 $\lambda = 4$. $e^{-\lambda} + \lambda e^{-\lambda}$.

(a)

(b) same as (a)

(c) $\frac{10}{\lambda}$.