Anthony Snedaker
4-16

65) $\sum_{i=2}^{\infty} e^{-\lambda}\frac{\lambda^k}{k!} = 1 - e^{-\lambda} - e^{-\lambda}\lambda$

$= 1 - e^{-3} - 3e^{-3} = \underline{0.8009}$

65 A
66 A
67 A

66) p = prob no accidents occur in 1 month $= e^{-\lambda}$

$\binom{6}{3} p^3 (1-p)^3 = \binom{6}{3}(e^{-\lambda})^3(1-e^{-\lambda})^3$

$= \binom{6}{3}(e^{-3})^3(1-e^{-3})^3 = 0.002118$

67) $E[X^2] = \lambda(\lambda+1)$

$E[X^3] = \sum_{k=0}^{\infty} k^3 p(X=k)$

$= \sum_{k=0}^{\infty} k^3 e^{-\lambda}\frac{\lambda^k}{k!}$

$= \sum_{k=1}^{\infty} k^2 e^{-\lambda}\frac{\lambda^k}{(k-1)!} = \sum_{k=0}^{\infty}(k+1)^2 e^{-\lambda}\frac{\lambda^{k+1}}{k!}$

$= \lambda \sum_{k=0}^{\infty}(k+1)^2 e^{-\lambda}\frac{\lambda^k}{k!}$

$= \lambda E[(X+1)^2]$

$= \lambda\left[E[X^2] + E[2X] + E[1]\right]$

$= \lambda(\lambda(\lambda+1) + 2\lambda + 1) = \lambda^3 + 3\lambda^2 + \lambda$

$= \lambda[\lambda^2 + 3\lambda + 1]$