Math 445/545 Answers to Chapter 5 Homework part 1.

5.1 e^{-1}, e^{-1}.

5.2 $6/\mu$.

5.3 (a) is correct.

5.4 (a) 0, (b) 1/27, (c) 1/4.

5.5 e^{-1}.

5.6 By memoryless property, if Jones leaves first, $P(S > B) = \frac{\lambda_2}{\lambda_1+\lambda_2}$, and if Brown leaves first, $P(S > J) = \frac{\lambda_1}{\lambda_1+\lambda_2}$.
Then P[Smith is last] =

$$\left(\frac{\lambda_1}{\lambda_1+\lambda_2}\right) P(J < B) + \left(\frac{\lambda_2}{\lambda_1+\lambda_2}\right) P(B < J)$$

$$= \left(\frac{\lambda_1}{\lambda_1+\lambda_2}\right)^2 + \left(\frac{\lambda_2}{\lambda_1+\lambda_2}\right)^2.$$

5.7 (in class)

5.9 $1 - e^{-\lambda_1 t} + e^{-\lambda_1 t}\frac{\lambda_1}{\lambda_1+\lambda_2}$.

5.13 $\frac{n}{n\theta+\mu}$.