REVIEW PROBLEMS No. 5

Textbook: Problems 7.4, 8.1, 8.2

Problem S4.1: Consider the scenario of Problem S3.1 restated as follows. A student's life alternates between sleep, work, and drinking coffee/eating. When at home, the student wakes up at the end of each hour with probability $\frac{1}{5}$ and gets up to go to work, and with probability $\frac{4}{5}$ she goes on to sleep another hour. Conversely, when at work, at the end of each hour the student goes back home to sleep with probability $\frac{1}{4}$, stays at work with probability $\frac{2}{3}$, or goes to get coffee at the coffee house with probability $\frac{1}{12}$. Finally, once at the coffee house, after each hour there the student leaves with probability $\frac{3}{4}$ to get back to work, or stays for another hour with probability $\frac{1}{4}$.

Find the fraction of time the student spends sleeping, at work, and at the coffee house, *i.e.,* the probabilities that the student is at home, work and the coffee house. Find also the average durations of the blocks of time the student spends at home (sleeping), at work, and at the coffee house before heading somewhere else.