Instructions: These problems are just for practice with the newer material. Do NOT turn them in. I will have solutions to these available in Monday’s class (Oct 23rd), and you might also be doing some of these in recitation.

Problems: 14.3, 14.5, 15.4, 25.7, 25.8, 25.21

Note, in problem 25.7, you should assume that $X$ is non-negative and continuous.

Problem 25.21: Mouse Trap in Transforms

A mouse is trapped in a maze. Initially it has to choose one of two directions. If it goes to the right, then it will wander around in the maze for 3 minutes and will then return to its initial position. If it goes to the left, then with probability $\frac{1}{3}$, it will depart the maze after 2 minutes of traveling, and with probability $\frac{2}{3}$ it will return to its initial position after 5 minutes of traveling. Assume that the mouse is at all times equally likely to go to the left or the right. Let $T$ denote the number of minutes that it will be trapped in the maze.

In an old homework, we computed $\mathbb{E}[T]$ and $\text{Var}\{T\}$. This time compute $\hat{T}(z)$, and then differentiate it to get $\mathbb{E}[T]$. 