There are two problems from the book and two problems from our Classwork problems. Want more practice? Do more problems from the book, or see me. By the way, I think that Exercise 8.11 is really interesting, but I'm not assigning it.

Exercise 8.2 (about Rayleigh density; notice that $g(x) = x^2$ is strictly increasing for $x > 0$)

Exercise 8.5 (about $E(e^X)$ in two ways)

A. Do Classwork 44, about the log-normal distribution. (By the way, this distribution is really important in applications.)

For the final problem, let $X, Y \sim \text{Norm}(0, 1)$ be independent, and let $Z = X + Y$. The overall question is: Is Z normal? But that's a big question, so let's break it down into three steps.

B.A. Simplified as much as possible, what's the PDF of $\frac{1}{\sqrt{2}}X + b$?

B.B. What are the expectation and variance of Z? So, if Z were normal, then what would its PDF be?

B.C. Is Z normal? (This basic algebra fact might help you:

$$x^2 + (z - x)^2 = \frac{1}{2}z^2 + \left(\sqrt{2}x - \frac{1}{\sqrt{2}}z\right)^2.$$

Also, your answer to B.A might help you.)