Read: Chapter 3
Topics: continuous random variables, densities, expectation, moments, characteristic functions

1. Problem 2, p. 104, Gubner, also find the mean
2. Problem 3, p. 104, Gubner
3. Problem 5b, p. 104, Gubner
4. Problem 35, p. 111, Gubner, you may use characteristic or moment generating functions
5. Problem 46a, p. 113, Gubner
6. Problem 49, p. 113, Gubner
7. Problem 52, p. 114, Gubner
8. Let $X$ and $Y$ be independent and identical discrete random variables with probability mass
   functions
   $$p_X(k) = p_Y(k) = (1-q) q^k, \quad k = 0, 1, \ldots \quad \text{where} \quad 0 < q < 1.$$  
   Let $Z = X - Y$.
   (a) Find the characteristic function of $X$ in closed form.
   (b) Find the characteristic function of $Z$.
   (c) Find the mean and variance of $Z$ and $X$ using the characteristic function method.
9. Find the characteristic function (in closed form) of a Laplacian density with variance $\sigma^2$.
10. Find the probability distribution of the random variable $X$ corresponding to the following
    characteristic function:
    $$\phi_X(v) = \frac{e^{3jv}}{3} + \frac{e^{4jv}}{4} + \frac{5e^{5jv}}{12}$$