NOTE: The following problems are from Chapter 1 of the textbook.

1) Problem 5.10 parts (a)-(e)
   Note: For part (b), you may need to use the following formula
   \[
   \binom{-m}{x} = \frac{(-m)(-m-1)\cdots(-m-k)\cdots}{x!\ (-m-x)(-m-x-1)\cdots(-m-x-k)\cdots}
   = \frac{m(m+1)\cdots(m+x-1)}{x!} \cdot (-1)^x
   \]

2) Problem 5.12

3) Problem 5.18 part (b)

4) Problem 5.28
   Note: For part (b), you may want to consider the exponential distribution

5) Problem 5.33
   Note: You may need to use the following equation
   \[
   \Gamma\left(\frac{1}{2} + t\right) \cdot \Gamma\left(\frac{1}{2} - t\right) = \frac{\pi}{\cos(\pi \cdot t)}
   \]