MTHE/STAT 351 — Fall 2016
Practice Problem Set 5

Chapter, section and problem numbers refer to the 3rd edition of the Ghahramani textbook.

1. (a) Section 4.2, # 1.
   (b) Find and sketch the distribution function of the random variable $X$ defined in the above problem.

2. Section 4.2, # 7.

3. Section 4.2, # 16.

4. Section 4.3, # 7 (c) and (d).

5. (a) Section 4.4, # 5. [Note: A fair game is one in which the expected value of the net gain is zero. Net gain = $ won − $ paid to play the game.]
   (b) If the $15 ball is taken out and replaced by a $k$ ball, what value of $k$ would make this a fair game?

6. A random variable $X$ has distribution function

\[
F_X(x) = \begin{cases} 
0 & \text{if } x < -1 \\
1/2 & \text{if } -1 \leq x < 0 \\
2/3 & \text{if } 0 \leq x < 1 \\
1 & \text{if } x \geq 1 
\end{cases}
\]

(a) Find $P(X < 0)$, $P(X > 0)$ and $P(-1 < X < 1)$.
(b) Find $E[X]$ and $E[X^2 - X + 10]$. 