STAT/MA 41600
In-Class Problem Set #10: September 13, 2017

1a. Roll a 4-sided die and a 6-sided die. Let X denote the sum. Calculate the probability mass function $p_X(x)$.
1b. Calculate $\mathbb{E}(X)$.

2a. Flip 5 fair coins. Let X denote the number of heads that appear. Calculate $p_X(x)$.
2b. Calculate $\mathbb{E}(X)$.

3a. Suppose we draw 5 cards at random, without replacement, from a deck of 52 cards (such a deck includes 4 Queens). Let X denote the number of Queens drawn. Find the probability mass function $p_X(x)$ and the expected value $\mathbb{E}(X)$.
3b. Same question, but this time draw the 5 cards one at a time, with replacement (and shuffling) between cards.

4. A family with three daughters and three sons needs to go to the grocery store. Besides the father, who is driving the car, exactly three of the children can come along to the grocery store with him. Suppose that the three children to join the father are chosen randomly, and all such choices are equally likely.

Let X denote the number of daughters who accompany the father to the grocery. Use the probability mass function of X (see Problem Set 8) to find the expected value of X.