STAT/MA 41600
Practice Problems: September 12, 2014

1. Butterflies. Alice, Bob, and Charlotte are looking for butterflies. They look in three separate parts of a field, so that their probabilities of success do not affect each other.

- Alice finds 1 butterfly with probability 17%, and otherwise does not find one.
- Bob finds 1 butterfly with probability 25%, and otherwise does not find one.
- Charlotte finds 1 butterfly with probability 45%, and otherwise does not find one.

Let X be the number of butterflies that they catch altogether.

Find the mass of X.

2. Appetizers. At a restaurant that sells appetizers:

- 8% of the appetizers cost \$1 each,
- 20% of the appetizers cost \$2 each,
- 32% of the appetizers cost \$3 each,
- 40% of the appetizers cost \$4 each.

An appetizer is chosen at random, and X is its price. Draw the CDF of X.

3. Wastebasket basketball. Chris tries to throw a ball of paper in the wastebasket behind his back (without looking). He estimates that his chance of success each time, regardless of the outcome of the other attempts, is 1/3. Let X be the number of attempts required. If he is not successful within the first 5 attempts, then he quits, and he lets $X = 6$ in such a case.

Draw the mass of X.

Draw the CDF of X.

4. Two 4-sided dice. Consider some special 4-sided dice. Roll two of these dice and let X denote the sum.

Draw the mass of X.

Draw the CDF of X.

5. Pick two cards. Pick two cards at random from a well-shuffled deck of 52 cards (pick them simultaneously, i.e., grab two cards at once—so they are not the same card!). There are 12 cards which are considered face cards (4 Jacks, 4 Queens, 4 Kings). Let X be the number of face cards that you get.

Draw the CDF $F_X(x)$ of X.