STAT/MA 41600
In-Class Problem Set #7: September 7, 2016

1a. Let X denote the number of buses that arrive downtown at the bus stop during the next 12.5 minutes. Is X a discrete or continuous random variable?
1b. Let Y denote the time (in seconds) until the next bus arrives downtown. Is Y a discrete or continuous random variable?

2. Consider two 4-sided dice, each numbered 1, 2, 3, 4. Roll the two dice, and let X denote the difference in the values.

Find $P(X = 0)$, $P(X = 1)$, $P(X = 2)$, and $P(X = 3)$.

3. Pick two cards simultaneously at random from a well-shuffled deck of 52 cards. There are 36 cards which have numbers on them (cards 2 through 10, in each of the 4 suits), and there are 16 cards without numbers on them (A, J, Q, K, in each of the 4 suits). Let X be the number of cards that you get with numbers on them.

Find $P(X = 0)$, $P(X = 1)$, and $P(X = 2)$.

4. Consider a collection of 6 bears. There is a pair of red bears consisting of one father bear and one mother bear. There is a similar green bear pair, and a similar blue bear pair. A bear pair is happy if it is sitting together. Let X denote the number of happy bear pairs.

Find $P(X = 0)$, $P(X = 1)$, $P(X = 2)$, and $P(X = 3)$.