Kaleb Burris
STAT F300 Statistics, Dr. Short
Worksheet 9, Due Wednesday, February 8, 4:15pm

Consider an experiment in which we toss a pair of fair 4-sided dice, one red, one white. Let $X = |(\text{\# spots on Red}) - (\text{\# spots on White})|$; that is, X is the absolute value of the difference between the number of spots on the Red and White dice.

1. Find the probability mass function (pmf) of X. Your final answer should be a table that has one column for the 5 possible values of X (i.e. 5 rows) and another column for the probability of obtaining each of these values.

$$X = \begin{cases} X=0 & = \{11,22,33,44,55,66\}; \# = 6 \\ X=1 & = \{12,21,32,23,34,43,54,45,65,56\}; \# = 10 \\ X=2 & = \{13,31,24,42,35,53,46,64\}; \# = 8 \\ X=3 & = \{14,41,25,52,36,63\}; \# = 6 \\ X=4 & = \{15,51,62,26\}; \# = 4 \\ X=5 & = \{16,61\}; \# = 2 \end{cases}$$

$\#X = X_0 + X_1 \dots X_5 = 36$

X	$p(x) = P(X = x)$
0	$\frac{6}{36}$
1	$\frac{10}{36}$
2	$\frac{8}{36}$
3	$\frac{6}{36}$
4	$\frac{4}{36}$
5	$\frac{2}{36}$

2. Find the cumulative distribution function (cdf) of X and sketch its graph.

$$F(x) = \begin{cases} X=0 & \text{if}(\frac{6}{36} < x) \\ X=1 & \text{if}(\frac{6}{36} \le x < \frac{16}{36}) \\ X=2 & \text{if}(\frac{16}{36} \le x < \frac{24}{36}) \\ X=3 & \text{if}(\frac{24}{36} \le x < \frac{30}{36}) \\ X=4 & \text{if}(\frac{30}{36} \le x < \frac{34}{36}) \\ X=5 & \text{if}(\frac{34}{36} \le x \le 1) \end{cases}$$