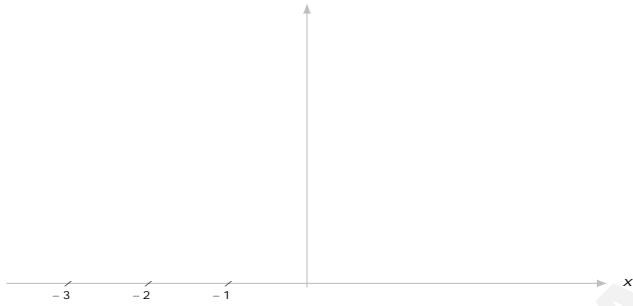2. (32pts) You have 6 coins in front of you. Five of the coins are unbiased (i.e., the probability of tossing a head is 50%). The sixth coin is biased, and the probability of tossing a head is 70%. It is not possible to tell which is the biased coin just by looking. You plan to pick a coin at random and then will flip it three times.

   (a) (4pts) If an unbiased coin was picked, what is the probability that two of three tosses will be heads? What assumptions are you making?

   (b) (4pts) If the biased coin was picked, what is the probability that two of three tosses will be heads? What assumptions are you making?

   (c) (8pts) What is the total probability of tossing two heads?

   (d) (8pts) You pick a coin, toss it three times and get two heads. What is the probability you selected the biased coin?

   (e) (8pts) Now let $Y$ be the *total number of flips of the biased coin required to get exactly three heads* (we stop flipping after the occurrence of the third head). Find $P(Y =$

(a) (8pts) What is the sample space of all possible outcomes of rolling the pair of dice? (Your answer should be in the appropriate set notation.)

(b) (4pts) Define the random variable $X$ to be the amount of money Shedeur gains/loses on a single turn. What values can $X$ take on?

(c) (8pts) Find the

Just for fun, the plot of the pmf and cdf are shown below: