1. A very wobbly 4-sided die is used in a particular game. For this die, the pmf is given by

X	P(X)
1	0.3
2	0.2
3	0.15
4	0.35

(a) What is the cdf for this die?

X	C(X)
1	0.3
2	0.5
3	0.65
4	1

(b) If the die is rolled twice, what is the probability of the sum being a 4?

- (0.3)*(0.15) + (0.15)*(0.3) + (0.2)*(0.2) = 0.13

2. A fair coin is flipped 12 times.

   a. What is the probability that the coin is heads exactly half of the time?

      i. dbinom(6,12,0.5)

      ii. [1] 0.2255859

   b. What is the probability that the coin is heads 3 times or less?

      i. pbinom(3,12,0.5)

      ii. [1] 0.07299805

   c. Perform a simulation of this coin flip in R. (1 simulation of 12 coin flips)

      i. rbinom(1,12,0.5)

      ii. [1] 7

3. In a certain game, a player has a 20% chance of winning.

   a. If the player plays the game 6 times, what is the probability of winning at least twice?

      i.   1 - pbinom(1, 6, .20)

     ii. [1] 0.34464

b. What is the probability on winning zero out of 6 times?

      i.   dbinom(0,6,0.20)

     ii. [1] 0.262144

c. Perform 1,000 simulations of playing the game 6 times. How does the proportion in the simulation of getting a zero compare to your answer for b?

      i.   sum(rbinom(1000, 6, 0.20)==0)/1000

     ii. [1] 0.247