Math 5710 , Discrete Random Variables

1. Given a biased coin with probability of "heads" equal to 1/3, let X be the number of tosses until the first head occurs. Find the probability frequency function of X and the cumulative distribution function of X. Sketch both graphs.

2. The probability frequency function of a random variable X is given by

$$p(i) = \frac{k2^i}{i!} \quad \text{for i = 0 , 1 , 2 , …}$$

a) Find the value of k .

b) Find P(X = 0)

c) Find P(X > 2)

3. Given one draw from [1 , 1 , 2 , 2 , 2 , 3] , let X = number drawn.

a) With 120 draws, how many 1's do you expect to see? How many 2's?
How many 3's?

b) With 120 draws, what do you expect the average of the draws to be? 240 draws? 480 draws? 3 trillion draws?

c) With one draw, what do you expect the value of X to be?