Stochastics Quiz #1

Name:

10 points total, 5 points each

Question 1: Suppose you have $63 and go to the casino, and play a game of roulette that only has 2 possible outcomes, red and green, such that P[red] = P[green] = ½. You employ the following strategy. First, you bet 1$ on red or green, if you guess correctly, you win $1, and leave the casino with $64. If you lose, you double down, and bet $2, in which case, if you guess correctly, you win $4. If you win, you take your winnings and go home. You keep doubling down until you either run out of money, or win once and then you stop.

1. What is the sample space of possible outcomes? (i.e. if you do this experiment, what possible winnings could you have?)
2. Write a PMF for the possible win amounts.
3. Find the average win amount?
4. Is this a good strategy? Should you play this game every day?

Question 2: *U* is a uniform random variable from (0,1). Let

Find the cdf and pdf of *X*