1. The PMF for X is: .
2. The expected utility function is:
3. You should chose B = 0 because you are more likely to lose B dollars than win B dollars, so you are most likely going to lose money if .
4. In order to maximize the expected utility function with respect to B we need to take the derivative of the expected utility function with respect to B:

. This answer makes sense because as p approaches 1 your probability of winning goes up, so you should bet a larger percentage of A. Additionally if p = 1, you should bet all your money as you're guaranteed to win and when you plug p = 1 into this equation you get B = A.