Ex 1: Define some random variables on the following experiments:

a) Experiment = Flip a single coin 4 times
b) Experiment = Draw a single card from a standard poker deck
c) Experiment = Draw 2 cards from a standard poker deck one by one with replacement
d) Experiment = Draw 2 cards from a standard poker deck one by one without replacement

Ex 2:
Experiment = Roll a pair of dice
Random Variable X = Total of the numbers on the dice

a) Find the probability distribution of X (as a table and as a histogram)
b) Verify that your answer to part (a) satisfies the 2 requirements of a probability distribution

Ex 3:
Experiment = Draw a single card from a standard poker deck
Suppose you make a bet with your friend where you…

Win $10 if you draw the ace of spades
Win $5 if you draw any other ace
Win $2 of you draw any other spade
Lose $1 of you draw anything else

Random Variable X = Amount of money you win when playing this game once

a) Find the probability distribution of X (as a table and as a histogram)
b) Verify that your answer to part (a) satisfies the 2 requirements of a probability distribution

Ex 4: You and a friend are betting on the roll of a die. Specifically you will lose $1 if you roll a 1, 2, or 3, you will lose $2 if you roll a 4 or 5, and you will win $8 if you roll a 6. Let the random variable X denote the amount of money you win when playing this game once.

a) Find the probability distribution of X
b) Find the expected value, standard deviation and variance of X
c) Explain the meaning of the expected value you obtained in part (b)
d) Is this a good bet for you? Or for your friend?

Ex 5: You are going to draw a single ball from the bag below once. Let X denote the number on the ball that you drew.

a) Find the probability distribution of X
b) Find the expected value, standard deviation and variance of X
c) Explain the meaning of the expected value you obtained in part (b)

<u>Ex 6</u>: In this example we are going to analyze 2 different bets in roulette.

Bet 1: You bet $100 on red. Let X denote the amount of money you win when you make this bet once. (Note: If you win this bet, you will win $100)

Bet 2: You bet $100 on the number 28. Let Y denote the amount of money you win when you make this bet once. (Note: When betting on a single number, if you win you will win 35 times your bet. So winning this bet will profit you $3500)

a) Find the probability distributions of X and Y

b) Find the expected values, standard deviations and variances of X and Y

c) Explain the meaning of the expected values you obtained in part (b)

d) Discuss which is a better bet.