BUEC 333: Some Answers to Study Questions for the Midterm

1. Construct the pdf and cdf for the sum of 3 dice. Using the cdf, show the probability of getting a sum in the range of [6,8]. pdf and cdf in 216'ths.

	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	1	3	6	10	15	21	25	27	27	25	21	15	10	6	3	1
	1	4	10	20	35	56	81	108	135	160	181	196	206	212	215	216

2. Construct the pdf and cdf for the sum of 4 coin flips (0,1). Using the cdf, show the probability of getting at least 3 heads. expressed in 16'ths. P[sum>=3]=5/16.

	0	1	2	3	4
Pdf	1	4	6	4	1
cdf	1	5	11	15	16

3. Consider a discrete random variable *Y* whose pdf is given by the table:

range:	-2	-1	0	1	2
probability:	0.067	0.242	0.382	0.242	0.067

This discrete random variable was created by discretizing the standard normal into ranges (less than -1.5), (-1.5 to -0.5), (-0.5 to 0.5), (0.5 to 1.5) and (1.5 and up), and assigning values -2,-1,0,1 and 2.

What is the pdf and cdf for the *W=2Y+3*?

	-1	1	3	5	7
Pdf	0.067	0.242	0.382	0.242	0.067
cdf	0.067	0.309	0.691	0.933	1

What is *E[W]* and *Var[W]*? E[W]=3; V[W]= 4.08.

What is the pdf and cdf for *V=Y*Y*?

	0	1	4
pdf:	0.382	0.484	0.134

What is *E[V]* and *Var[V]*? 1.02 and 1.588

4. Consider a 100 observations of a random variable distributed N(4,1600).

    a. What is the distribution of the average of those 100 observations? (That is, what is the sampling distribution of a statistic equal to the sample mean?)

        i. N(4,16)

    b. What is the probability that the true value of the population mean is 0, but we just happened to draw a sample whose average is 4 or more?

        i. 0.159

    c. What is the 80% confidence interval for the true mean of the variable in the population?

        i. -1.12 to 9.12