1. (10 points) Given the following probability distribution:

Number of Books (x)	P(x)
0	0.07
1	0.20
2	0.10
3	0.13
4	0.40
5	0.10

Find the following (round to 2 decimal places):

a) Mean

b) Standard Deviation

c) Variance

2. (5 points) Using the formula for Binomial, setup the following problems (no need to plug into the calculator)

a) n = 8, p = 0.7, find P(x = 3)

b) n = 12, p = 0.31, find P(x < 4)

3. (10 points) Using the attached tables, find the following binomial probabilities (circle the values on the attached table along with your calculators)

    a.   n = 9, p = 0.25, find P(x < 3)

TABLE III (continued)

n	x	0.01	0.05	0.10	0.15	0.20	0.25	0.30
8	0	0.9227	0.6634	0.4305	0.2725	0.1678	0.1001	0.0576
	1	0.0746	0.2793	0.3826	0.3847	0.3355	0.2670	0.1977
	2	0.0026	0.0515	0.1488	0.2376	0.2936	0.3115	0.2965
	3	0.0001	0.0054	0.0331	0.0839	0.1468	0.2076	0.2541
	4	0.0000+	0.0004	0.0046	0.0185	0.0459	0.0865	0.1361
	5	0.0000+	0.0000+	0.0004	0.0026	0.0092	0.0231	0.0467
	6	0.0000+	0.0000+	0.0000+	0.0002	0.0011	0.0038	0.0100
	7	0.0000+	0.0000+	0.0000+	0.0000+	0.0001	0.0004	0.0012
	8	0.0000+	0.0000+	0.0000+	0.0000+	0.0000+	0.0000+	0.0001
9	0	0.9135	0.6302	0.3874	0.2316	0.1342	0.0751	0.0404
	1	0.0830	0.2985	0.3874	0.3679	0.3020	0.2253	0.1556
	2	0.0034	0.0629	0.1722	0.2597	0.3020	0.3003	0.2668
	3	0.0001	0.0077	0.0446	0.1069	0.1762	0.2336	0.2668
	4	0.0000+	0.0006	0.0074	0.0283	0.0661	0.1168	0.1715
	5	0.0000+	0.0000+	0.0008	0.0050	0.0165	0.0389	0.0735
	6	0.0000+	0.0000+	0.0001	0.0006	0.0028	0.0087	0.0210
	7	0.0000+	0.0000+	0.0000+	0.0000+	0.0003	0.0012	0.0039
	8	0.0000+	0.0000+	0.0000+	0.0000+	0.0000+	0.0001	0.0004
	9	0.0000+	0.0000+	0.0000+	0.0000+	0.0000+	0.0000+	0.0000+

* This is the normal binomial distribution table (not cumulative)

b.   n = 8, p = 0.35, find P(x<5)

TABLE IV *(continued)*

n	x	0.01	0.05	0.10	0.15	0.20	0.25	0.30	0.35
8	0	0.9227	0.6634	0.4305	0.2725	0.1678	0.1001	0.0576	0.0319
	1	0.9973	0.9428	0.8131	0.6572	0.5033	0.3671	0.2553	0.1691
	2	0.9999	0.9942	0.9619	0.8948	0.7969	0.6785	0.5518	0.4278
	3	1.0000-	0.9996	0.9950	0.9786	0.9437	0.8862	0.8059	0.7064
	4	1.0000–	1.0000–	0.9996	0.9971	0.9896	0.9727	0.9420	0.8389
	5	1.0000–	1.0000–	1.0000–	0.9998	0.9988	0.9958	0.9887	0.9747
	6	1.0000–	1.0000–	1.0000–	1.0000–	0.9999	0.9996	0.9987	0.9964
	7	1.0000–	1.0000–	1.0000–	1.0000–	1.0000-	1.0000–	0.9999	0.9998
	8	1	1	1	1	1	1	1	1
9	0	0.9135	0.6302	0.3874	0.2316	0.1342	0.0751	0.0404	0.0207
	1	0.9966	0.9288	0.7748	0.5995	0.4362	0.3003	0.1960	0.1211
	2	0.9999	0.9916	0.9470	0.8591	0.7382	0.6007	0.4628	0.3373
	3	1.0000–	0.9994	0.9917	0.9661	0.9144	0.8343	0.7297	0.6089
	4	1.0000–	1.0000–	0.9991	0.9944	0.9804	0.9511	0.9012	0.8283
	5	1.0000–	1.0000–	0.9999	0.9994	0.9969	0.9900	0.9747	0.9464
	6	1.0000–	1.0000–	1.0000–	1.0000–	0.9997	0.9987	0.9957	0.9888
	7	1.0000–	1.0000–	1.0000–	1.0000–	1.0000–	0.9999	0.9996	0.9986
	8	1.0000–	1.0000–	1.0000–	1.0000–	1.0000–	1.0000–	1.0000–	0.9999
	9	1	1	1	1	1	1	1	1

* This is the cumulative binomial distribution table

4.   (35 points) Various problem that use the same techniques demonstrated with this example:
If 30% of the bolts produced by a machine are defective, if 10 bolts are chosen at random, find the following probabilities assuming it follows a binomial distribution:
a) P(less than 7 are defective)
b) P(exactly 3 are defective)
c) P(at most 2 are defective)
d) P(more than 3 are defective)
e) P(at least 7 are defective)
f) P(between 2 and 5 are defective, inclusive)

5. (5 points) 15% of Cowley Students believe in Bigfoot. Compute the mean, standard deviation, and variance of the random variable X, the number of Cowley students that believe in Bigfoot based on a random sample of 200 students.

6. (30 points) Various problems that use the same techniques demonstrated with this example: Between 1 and 5 P.M., calls to a help desk follow a Poisson distribution with an average of 5 calls per minute. Over 10 minutes, find the following probabilities:
   a) P(Exactly 45 calls come in)
   b) P(Less than 30 calls come in)
   c) P(At most 40 calls come in)
   d) P(More than 52 calls come in)
   e) P(At least 60 calls come in)
   f) P(Between 20 and 40 calls come in, inclusive)

7. (5 points) Using the formula for Poisson, setup the following problems (no need to plug into the calculator)

a) $\lambda = 3$, $t = 5$, find $P(x = 10)$

b) $\lambda = 3$, $t = 1$, find $P(x < 3)$