Midterm Exam 2, Spring 2008

Name:

- There are 3 problems, each worth between 30 and 40 points for a total of 100.

- Before you start, make sure your exam is not missing any page.

- You may do the problems in any order you like.

- You can earn lots of partial credits if you show your work.

- You are allowed two pages of notes (both sides) and a calculator.

- Please find the necessary tables attached to this exam.

For instructor's use only

Problem	Points	Score
1	30	
2	30	
3	40	
Total	100	

1. The weight of chickens at a farm are normally distributed with a mean of 7 lb and a standard deviation of 4 lb.

   (a) Find the probability that a randomly selected chicken will have a weight between 6.3 lb and 8.0 lb.

   (b) What weight will be exceeded by 20% of the chickens.

   (c) Suppose a "good" chicken has weight greater than 5.2 lb. Suppose we look at 10 chicken. What is the probability that at least 9 of them will be "good"?

2. Let X be a continuous random variable with CDF:

$$F(x) = \begin{cases} 0 & x \leq 0 \\ \frac{x}{4}\left[1 + \ln\left(\frac{4}{x}\right)\right] & 0 < x \leq 4 \\ 1 & x > 4 \end{cases}$$

(a) Calculate $P(X \leq 1)$

(b) Calculate $P(1 \leq X \leq 3)$

(c) What is the pdf of X?

3. Suppose X and Y are distributed as in the table below:

	X=0	X=2	X=4	p(y)
Y=0	0.5			0.7
Y=1		0.1		
p(x)	0.6	0.2		

(a) Fill in the joint and marginal distributions for X and Y.

(b) Find Cov(X,Y)

(c) Are X and Y independent?

(d) Find Var(4X-2Y).