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Homework 5

Assigned Friday, October 2

Due Friday, October 9 at classtime

Chapter 4: Continuous Random Variables and Distributions  
(including Weibull and log normal)

Chapter 5: Joint (Discrete) Distributions

For each problem, provide the solution and any work that can be used for partial credit.

Do all listed parts of following book problems.

4-96

4-108

4-113 only do  $a$ .      Recall  $\Gamma(\frac{1}{2}) = \sqrt{\pi}$

4-116

4-121 only  $a$  and  $b$ .      Set this up as two equations with two unknowns.

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Do the following written problems:

5A-1 Suppose that  $X$  is a binomial random variable with  $n=300$  and  $p=0.35$ .

- a) Approximate the probability that  $X$  is less than or equal to 90 using the normal approximation to the binomial.

More on back...

5A-2 The distance between major cracks in a highway follows an exponential distribution with a mean (or expected value) of 5 miles.

- a) What is  $\lambda$ ? (The rate parameter).
- b) What is the probability that there are no major cracks in a 10-mile stretch of the highway?
- c) What is the standard deviation of the distance between major cracks?
- d) What is the probability that the first major crack occurs between 12 and 15 miles of the inspection start point?

5A-3 The time between arrivals of customers at an automatic teller machine is an exponential random variable with a mean of 4 minutes.

- a) What is  $\lambda$ ?
- b) What is the probability that the time until the fifth customer arrives is less than 15 minutes?