Math 321-01 Spring 2015
Quiz 5 04.03.15 SOLUTIONS

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible; You have 20 minutes to take this 10 point quiz.

1. (*5 points*) A continuous random variable Y has cdf

$$F_Y(y) = \begin{cases} 0 & \text{if } y < 1 \\ \ln y & \text{if } 1 \le y \le e \\ 1 & \text{if } e < y \end{cases}$$

a. (*2 pts*) Find $P(Y < 2) = F_Y(2) = \ln 2$.

b. (*2 pts*) Find $P(2 < Y < 2.5) = F_Y(2.5) - F_Y(2) = \ln 2.5 - \ln 2$.

c. (*1 pt*) Find pdf $f_Y(y) = F_Y'(y) = \frac{1}{y}$ for $1 \le y \le e$ and zero otherwise.

2. (*5 points*) A manufacturer has 100 memory chips in stock, 4% of which are likely to be defective. A random sample of 30 chips is selected and shipped to a factory that assembles laptops. Let X denote the number of computers that receive faulty memory chips. Find $E(X)$.
Clearly X follows the hperb geometric distribution with $r = 4, w = 96, n = 30$. Thus,

$$E(X) = \frac{nr}{r+w} = 120/100 = 1.2.$$