QUIZ-4

1. Suppose that the PDF of X is f(x). $Y = |X|$. Show that the PDF of Y is

$$g(y) = \begin{cases} f(y) + f(-y), & y > 0 \\ 0, & \text{otherwise.} \end{cases}$$

2. The probability of hitting an aircraft is 0.001 for each shot. Using Poisson approximation, how many shots should be fired so that the probability of hitting with two or more shots is above 0.95?

3. You and three other people are to place bids for an object, with the high bid winning. You plan to bid 10 thousand dollars. The bids of the others can be regarded as being independent and uniformly distributed between 7 and 11 thousand dollars. Estimate the probability that you win the bid.

4. Jill's bowling scores are approximately normally distributed with mean 170 and standard deviation 20, while Jack's scores are approximately normally distributed with mean 160 and standard deviation 15. If Jack and Jill each bowl one game, then assuming that their scores are independent random variables, approximate the probability that (a) Jack's score is higher; (b) the total of their scores is above 350.

5. The joint density function of X and Y is given by

$$f(x, y) = \begin{cases} xe^{-xy}, & x > 0, y > 1 \\ 0, & \text{otherwise.} \end{cases}$$

Find P(X<1|Y=2).