STA 312F07 Quiz 1

1. (5 Points) Let X and Y be random variables with $E(X) = 0$ and $E(Y) = 0$, and let a and b be fixed constants. Using the usual properties of expected value (no integrals), find $Cov(X + a, Y + b)$. Show your work. *Circle your final answer.*

2. (5 Points) Let $X_1, \ldots, X_n$ be a random sample from a discrete probability distribution with probability mass function

$$p(x) = \theta^x (1 - \theta)^{1-x}$$

   where x can be either 0 or 1, and $0 < \theta < 1$. (This is Bernoulli).

   (a) Find the Maximum Likelihood Estimator $\widehat{\theta}$. Show your work and *circle your final answer.*

   (b) Suppose we have a sample of size 3, with $X_1 = 0$, $X_2 = 0$ and $X_3 = 1$. What is $\widehat{\theta}$? The answer is a number. *Circle it.*

Total Marks = 10 points