## Seminar 16

1. Classify the following random variables as discrete or continuous.

   X: the number of automobile accidents per year in Hong Kong
   Y: the length of time to play 18 holes of golf.
   M: the amount of milk produced yearly by a particular cow.
   N: the number of eggs laid each month by a hen.
   P: the number of building permits issued each month in a certain city

2. Let W be a random variable giving the number of heads minus the number of tails in three tosses of a coin. List the elements of the sample space S for the three tosses of the coin, and the variable W.

3. A shipment of 7 television sets contains 2 defective sets. A hotel makes a random purchase of 3 of the sets. If X is the number of defective sets purchased by the hotel. Find the probability distribution of X. Express the results graphically as a probability distribution.

4. Find the cumulative distribution of the random variable X representing the number of defectives question 3. Using F(x), find

   a) P(X=1);

   b) P(0<X≤2).

5. An investment firm offers its customers municipal bonds that mature after different numbers of years. Given that the cumulative distribution of T, the number of years to maturity for a randomly selected bond is :

$$F(t) = \begin{cases} 0 & t < 1 \\ 1/4 & 1 \le t < 3 \\ 1/2 & 3 \le t < 5 \\ 3/4 & 5 \le t < 7 \\ 1 & t \ge 7 \end{cases}$$

   a) P(T=5);

   b) P(T>3);

   c) P(1.4<T<6);

   d) Express the probability distribution graphically.