Random Variables

Examples (CW)

1. Find the probability distribution of number of heads (X) obtained when 3 fair coins are tossed simultaneously.

2. Find the probability distribution of a number (X) that comes up when a die is thrown.

3. Find the probability distribution of the sum of the numbers (X) that appearing on the throw of two unbiased dice.

4. The probability density function of random variable X is

X	0	1	2	3	4	5	6
P(X=x)	K	3k	5k	7k	9k	11k	13k

6. Find k, P (X < 4), P (3 < X ≤ 6).

7. 1. Find the Expectation and variance of a number (X) that comes up when a die is thrown.

8. Given the following probability function of discrete random variable X is

X	0	1	2	3	4	5	6	7
P(X=x)	0	K	2k	2K	3 k	K^2	$2K^2$	$7k^2+k$

Find k, P(X < 6), P(X ≥ 6),P(0 < X < 5), $P\left(\frac{1.5 < X < 4.5}{X>2}\right)$, and the find the smallest value of λ for which $P(X \leq \lambda) > \frac{1}{2}$, Cumulative Distribution function.

9.A continuous random variable has pdf $f(x)$ given by

$$f(x) = \begin{cases} kx(1-x) \ ; 0 \leq x \leq 1 \\ 0 \qquad ; otherwise \end{cases}$$

Find k, mean μ, SD σ, $P(|x-\mu|) < \sigma$.

10. The length of time (in minutes) a lady speak on the telephone is found to be random phenomenon with

pdf as $$f(x) = \begin{cases} Ae^{-\frac{x}{5}} \ ; x \geq 0 \\ 0 \ ; otherwise \end{cases}.$$

Find A and the probability that she will speak more than 10 min., less than 5 min. & between 5 & 10 min.

11. A continuous random variable has pdf $f(x)$ given by

$$f(x) = \begin{cases} 2ax + b \ ; \ x \geq 0 \\ 0 \quad ; \ otherwise \end{cases}.$$

If the mean of the distribution is 3, find the constants a & b

12. What is the expectation and variance of the sum of points on the throw of n dice?