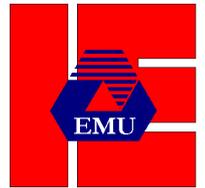




EASTERN MEDITERRANEAN UNIVERSITY
Department of Industrial Engineering
IENG385 Statistical Engineering
HOMEWORK 1 Fall 2018-19



- 1) A lot of 10 items contains 5 defective items. 3 items are chosen at random and tested, Let X denote the number of defectives
 - (a) Find all possible values and probability of each value of X and probability mass function of X .
 - (b) A lot is accepted if 1 or fewer of the 3 items are defective. What is the probability that the lot is accepted?
- 2) Suppose that X has a binomial distribution with parameters 8 and 0.5 show that $X = 4$ is the most likely outcome.

3) Find expected value of $Y=3X^2-5$ where $X=N(\mu, \sigma)=N(4,2)$.

4) If you buy a lottery ticket in 100 lotteries, in each of which your chance of winning a prize is 0.02, what is the (**approximate**) probability that you will win 2 prizes (a) at most three, (b) exactly once, (c) at least one?

5) Let X be a random variable with probability density

$$f(x) = \begin{cases} c + (1 - 2x^4) & -1 < x < 3 \\ 0 & \text{otherwise} \end{cases}$$

(a) What is the value of c ?

(b) Compute $P(-1.2 < X < 4.5)$.

6) Suppose that the service time of customers at a bank X is an exponential random variable with parameter $\lambda=0.1$. The person ahead of you has been served for 10 minutes, what is the probability that you will wait another 10 minutes or more before getting served?

7) Assuming that you have a normal distribution, what percentage of your distribution would have z-scores between -1.2 and 1.3? Use the area under the normal curve.

8) X is a normally distributed variable with mean $\mu = 30$ and standard deviation $\sigma^2 = 16$. Find

a) $P(x < 31)$

b) $P(x > 20)$

c) $P(20 < x < 25)$

d) $P(20 < \bar{x} < 25)$

9) Monthly cell phone bills for residents of a city have mean \$65 and variance 144. Random sample with size 100 is drawn.

a) What is the probability that the bill of one resident in this sample is greater than \$64?

b) What is the probability that the mean of this sample is greater than \$66?