**Kien Vu Homework 2 ISYE6400**

**Problem 1:** k-out-of-n system

Probability of a component working when checking at time t = 3 months, assuming n =8, k=4, r=3/2 and **λ = 1/10=> p= exp{-0.1t3/2}**

1. Probability that a k-out-of-n system is still operation when checked at time t =3:

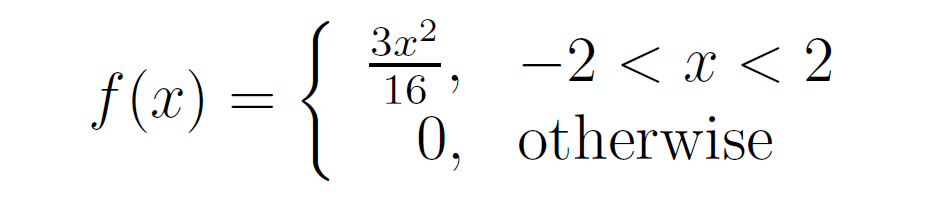
**P(X>=4) = = 0.5351**

1. Probability that a 5-out-of-n system is still operation when checked at time t =3:

**P(X==5) = = 0.2773**

Probability that exact 5 components working while the system working when checked at time t

**P(x==5|X>=4) = P(X==5)/P(X>=4) = 0.2773/0.5351 = 0.5182**

**Problem 2:**

1. Probability that a randomly chosen measurement can be classified as accurate (abs(X) < 0.5)

**P(abs(X)<0.5) = = = = 0.015625**

1. Cumulative distribution F(x) =  **= =**
2. Expected loss (mean of Y) :

**E(Y) = E() =**  **=**

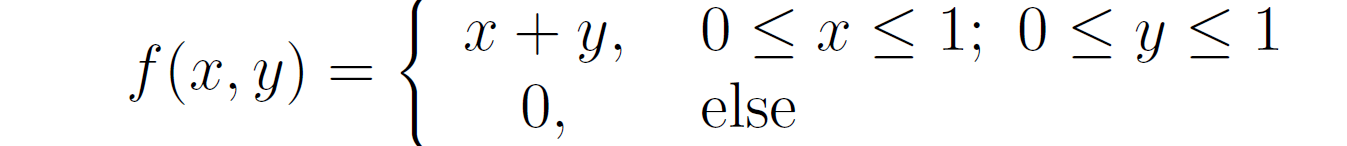
**E(Y) = = = 2.4**

1. Probability of Y is less than $3:

Y < $3 < X <

**P(abs(X)<) = = = = 2.054e-5**

**Problem 3:**

1. Marginal distribution of

**When 0<=x<=1, else 0**

1. Conditional distribution **f(y|x) = = when x, y in [0,1]**

**Else f(y|x) is undefined**

**Problem 4:**

**Pareto family: 1 (**

Therefore **c = M = 0.54876 and α = 34**

1. **= 0.5654**

**Therefore, the true value of parameter (0.6) in the credible set.**