## HAIGAZIAN UNIVERSITY **Mathematics Department**



## N.Noueihed

Mat 233 (probability & Statistics) Quiz 2

Dec 21/200

Time: 75 mins

Name: Zunoth5

Part 1

Do this part on the answer booklet.

(25%) 1. The lifetime of a certain brand of batteries in years is a random variable x with the (p.d.f)

$$f(x) = \begin{cases} 1/3, 0 < x < 1 \\ (4/3) (x-1), 1 < x < 2 \\ 0, \text{ otherwise} \end{cases}$$

a) Sketch the graph of the given density.

b) Calculate the probability that a given battery lasts less than 6 months.

c) Calculate the probability that a battery lasts over a year and a half.

d) Calculate the median lifetime.

e) Find the (c.d.f) formula.

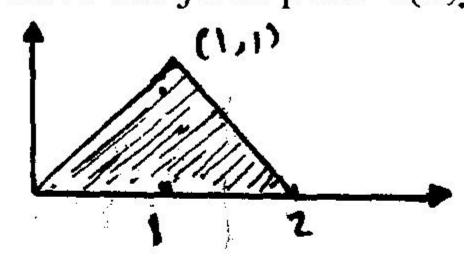
(25%)2. X and Y have the joint distribution.

a) Find  $p(X \le 1, Y \ge 2)$ . b) Find the marginal (P.m.f) s of X and Y.

c) Calculate the means of X and Y. d) Calculate E(X/Y=1) and E(Y/X=3).

e) Find the variance of Z = 2X - Y.

(25%)3. X and Y have the joint p.d.f f(x,y) = 1, where (x,y) belongs to the shaded area:



Find p  $(Y \le X/2)$ . b) Find the marginal (p.d.f)s of X and Y.

- c) Are X and Y independent. d) Calculate the means of X and Y.
- e) Calculate the covariance of X and Y.

(25%)4. a) Given E((x-2)) = 10, and E((X+2)) = 16, find the mean and variance of X.

b A box contains 10 balls numbered 1 through 10. A ball is to be selected at random with replacement 5 times. Let X be the smallest of the 5 selected nummers, find the formula for the (p.m.f) of X. (don't supply table, just a formula in terms of x where x is apossible value of the random variable X).

GOOD LUCK\$\$\$\$\$