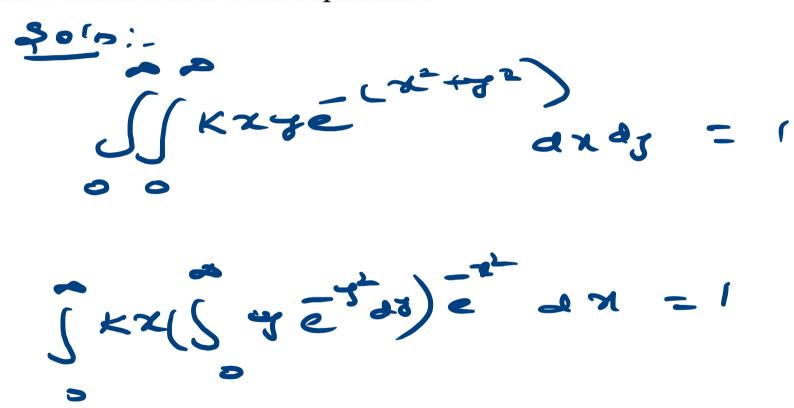
The joint pdf of R.V. X and Y is given by $f(x,y) = kxye^{-(x^2+y^2)}$, x > 0, y > 0. Find the value of k and also prove that X and Y are independent.



$$t = 7^{2}$$
, $f = 0$, $t = 0$
 $at = 27^{47}$
 $at = 9^{47}$

 $\int_{0}^{\infty} e^{\pm it} = \frac{1}{2} \left[-e^{\pm it} \right]_{0}^{\infty} = \frac{1}{2}.$

$$\sum_{i=1}^{n} x_i = 1$$







, x > - > 7 > 0

Sex =
$$\int 4\pi J = \int 2\pi J = \int 2\pi$$

$$= 4 \pi e^{-x^2} \left[\frac{1}{4} \right] = 2 \pi e^{-x^2}$$

$$= 4 \pi e^{-x^2} \left[\frac{1}{4} \right] = 2 \pi e^{-x^2}$$

Se7) = 27e

fex).f(r) = 2xex2. 2jet

= fexigo

7

=) X and

are independent

Given
$$f(x,y) = \begin{cases} Cx(x-y) & 0 < x < 2, -x < y < x \\ 0 & otherwise \end{cases}$$
. (i) Find C (ii) Find $f(x)$

$$C \int_{0}^{2\pi} (x^{3} - x^{3}) - (-x^{3} - x^{3}) dx = 1$$

$$C \int_{0}^{2\pi} x^{2} - x^{3} + x^{3} + x^{3} + x^{3} dx = 1$$

$$c\int_{-\infty}^{2} 2x^{2} dx = 1$$

$$3 \subset \left[\frac{34}{4}\right]^{2} = 1$$

$$\frac{2C}{4} \left(\frac{4}{1+2} \right) = 1$$

$$\frac{1}{8} \times (x-x) = 6 \times (x-x)$$

$$-x < x < x$$

= [x[(x2-x2)-(-x2)]

= 12[27-3]

$$f(7/m) = \frac{1}{5(2\pi)} = \frac{1}{28} \times (2\pi)$$

1 x 8 2

The joint pdf of a two-dimensional RV (X,Y) is given by $f(x,y) = xy^2 + \frac{x^2}{8}$, $0 \le x \le 2$, $0 \le y \le 1$. Compute P(X > 1), $P(Y < \frac{1}{2})$, $P(X > 1/Y < \frac{1}{2})$.

$$S(x) = \int x x^{2} + \frac{x^{2}}{4} dx$$

$$= \left[\frac{x^{3}}{3} + \frac{x^{2}F}{4} \right]_{0}^{1}$$

$$S(x) = \left(\frac{x}{3} + \frac{x^{2}}{4} \right)$$

$$P(X > 1) = 2 \left(\frac{x}{3} + \frac{x^2}{8} \right) dx$$

$$= \frac{38}{48} - \frac{17}{24}$$

- 472 + 8 = 272 + 5

$$= \left[\frac{23^3}{5} + \frac{7}{5} \right]$$

$$= 2(\frac{1}{2})_{4} + (\frac{1}{2})_{3}$$

$$= \frac{1}{3}(\frac{1}{2}) + (\frac{1}{2})_{3}$$

$$= \frac{1}{3}(\frac{1}{2}) + (\frac{1}{2})_{3}$$

P[X71 /2 < = [[] - P[(X71) U 7 < =]

P[7 = 1]

$$P[\times 7', 7 < \frac{1}{2}] = \frac{1}{2} \int_{a}^{2} (ax^{2} + \frac{ax}{4}) ax dx$$

If X and Y is a two dimensional R.V uniformly distributed over the triangular region R bounded by y = 0, x = 3 and $y = \frac{4x}{3}$. Find f(x), f(y), Mean of x, Var(X), mean of y and Var(Y)

The joint probability density function of a twodimensional random variable (X,Y) is given by

$$f(x,y) = \begin{cases} 2; 0 < x < 1, 0 < y < x; \\ 0, elswhere \end{cases}$$

- (i) Find the marginal density functions of x and y
- (ii) Check for independency of X and Y.