REVISION



In density functions of two independent R.V.s x and y are given by $f(x) = 2x \text{ in } 0 \le x \ge a \text{ and } f(y) = 2y \text{ in } 0 \le y \le b \text{ Find the coefficient}$

of correlation between U=X+Y and V=X-Y

$$f(x) = 2x \qquad g \qquad f(y) = 2y$$

$$a^{2} \qquad b^{2}$$

$$\int \frac{2\pi}{a^2} dy = \left[\frac{2xy}{a^2} \right]^a = \frac{2ax}{a^2} = \frac{2a}{a^2}$$

$$\int_{b^2}^{2y} dx = \left[\frac{2xy}{b^2} \right]_{b}^{b} = \frac{2}{3}$$

coefficient of correlation =

Second momentum = $\int_0^2 \chi^2 \int_0^2 (x) dx = \int_0^2 \int_0^2 \int_0^2 (x) dx$

$$= \int_{0}^{2} x^{2} \cdot 2x \, dx = \left[2x^{4} \right]_{0}^{2} = a^{4} = a^{2}$$

$$= \left[2x^{4} \right]_{0}^{2} = a^{4} = a^{2}$$

$$= \int_{0}^{b} y^{2} 2y dy = \left[\frac{2y^{4}}{4b^{2}} \right]_{0}^{b} = \frac{2b^{4}}{2b^{2}} = \frac{b^{2}}{2b^{2}}$$

Mean = $E(x) = \int_{0}^{a} x \int_{0}^{a} x \int_{0}^{a} x = \int_{0$

σxi : . E(x2) - (E(x))2

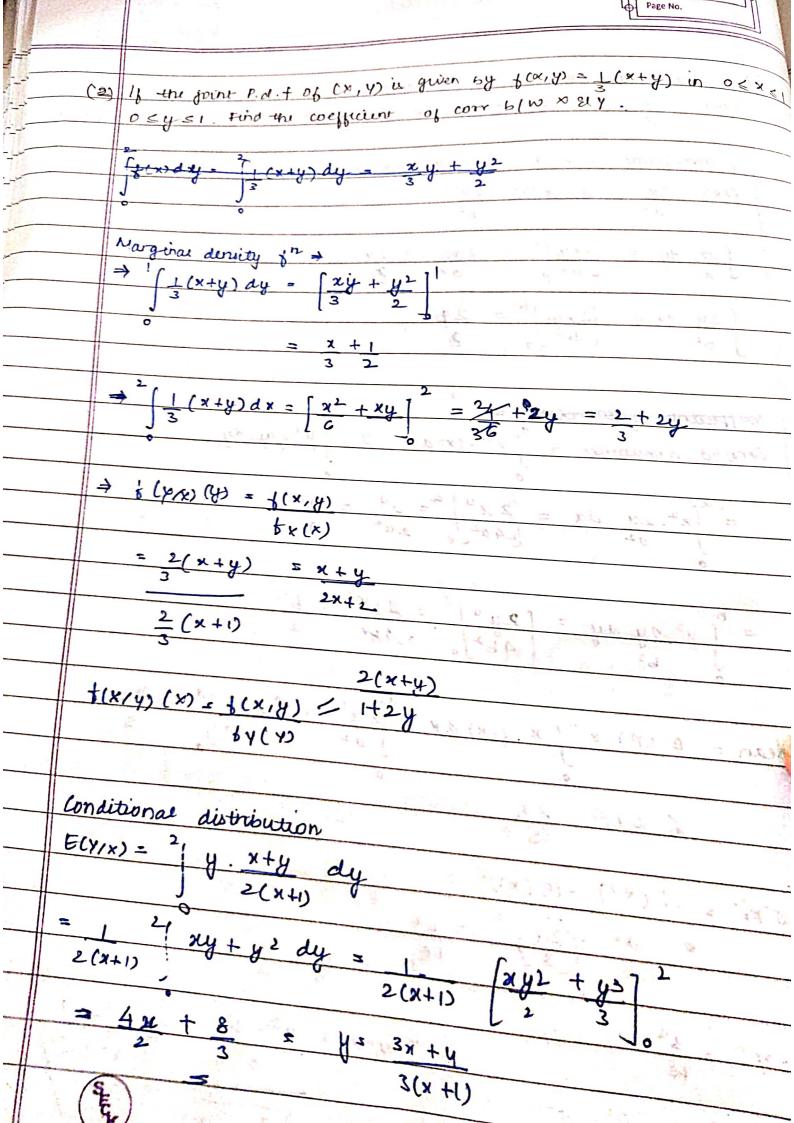
$$= \frac{a^2 - (2a)^2}{2} = \frac{a^2}{18}$$

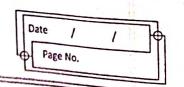
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$$r_{cu, v_1} = a^2 - b^2 = a^2 - b^2$$

(0.1 (UV) = a2-13-

Na2 + b2





$$F(X/Y) = \int \frac{x(2x+y)}{1+2y} dx$$

$$= \int \frac{2x^2 + xy}{1+2y} dx$$

$$1+2y$$

$$= \frac{1}{1+2y} \left[\frac{2x^3 + x^2y}{3} \right] = \frac{2+y^2x}{3}$$

$$= \frac{1+2y}{3} \left[\frac{2x^3 + x^2y}{3} \right] = \frac{2+y^2x}{3}$$

x = 2+3y 3 (1+2y)

oeff of reg bxy = 2 3(1+24)

3

Reg

1 + (1-1) 1 1 2 1 - 3 (4).

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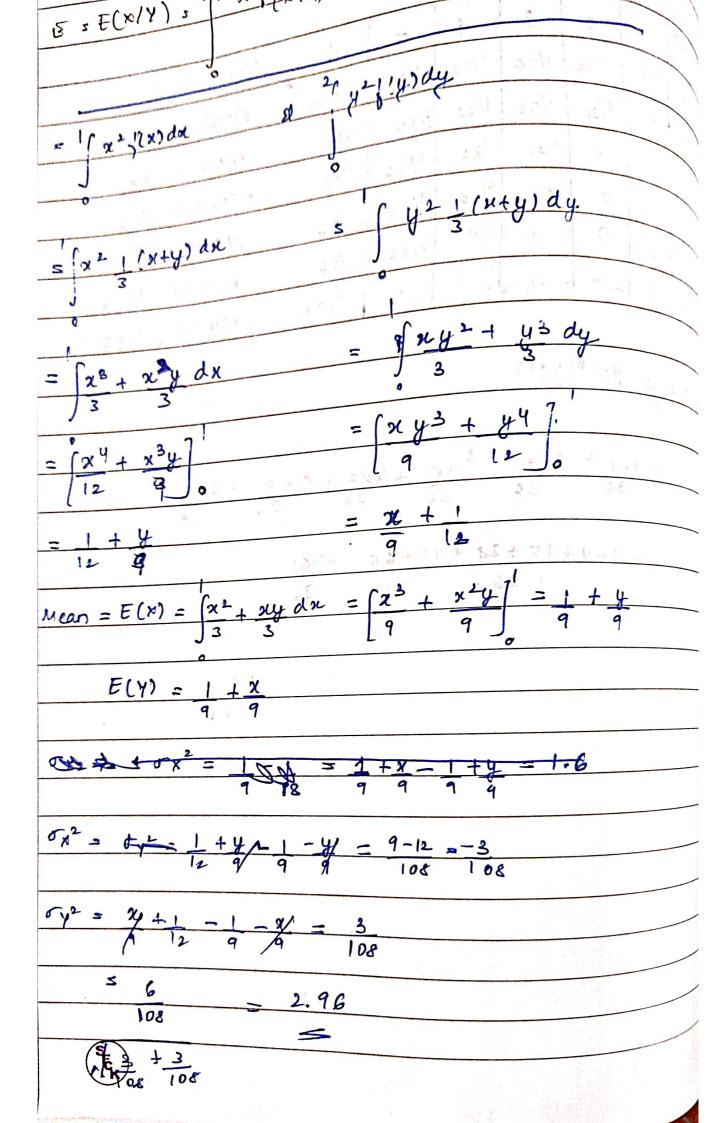
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$$= \int_{0}^{2\pi} x^{2} \int_{0}^{2\pi} x^{2} dx$$

$$= \int_{0}^{2\pi} x^{2} \int_{0}^{2\pi} x^{2}$$

(3) with the seaturent of policion distribution and vandna using possion distribution Pouson Distribution: P(x) = cmmx $E(x) = Mean: \mu_1' = E(x) = \sum_{k=0}^{\infty} r \cdot e^{-m_k r}$ $=0+\bar{c}^{m}m+2\bar{e}^{m}m^{2}+3\bar{e}^{m}m^{3}+4\bar{e}^{m}m^{4}+5\bar{e}^{-m}m^{5}+2\bar{e}^{m}m^{5}+2\bar{e}$ $= e^{-m} \left[\frac{1+m+m^2+m^3+m^4}{2!} + \frac{1}{3!} \right]$ = m = mean $= \frac{\tilde{z}}{r(r-l)} \frac{r(r-l)e^{-m}m^{r} + m}{r!}$ $(E(x))^{2} = r^{2} = r(r-1) + r$ $= 0 + 0 + 2e^{-m}m^2 + 3e^{-m}m^3 + 4e^{-m}m^4 + \cdots$ $= e^{-m} m^2 e^{-m} = m^2 + m$ $= m^2 + m$ variance = (E(x)) - E(x) = m2+m-m=m2 E(x2) - (E(x))2 = m2+m-m2== m

(A) 1/2 × 9 Y are standardized RVs such that the coefficient of correlation b/10 (2x+4) of (x+2y) is equal to 1/2. Find the coefficient of correlation b/10 x and y.

coeff of correlation = 1

(x+y) (x+24) U = 2x+y , V= x+24

 $\frac{1}{2} = \frac{E(UV)}{E(x)E(x)} \qquad \frac{1}{2} = \frac{E(UV)}{E(U)E(U)}$

 $\Rightarrow \Upsilon_{X,Y} = \frac{COV(X,Y)}{\sigma_X \sigma_Y}$

TU = E(U2) - (E(U)) 2

> 50+ 5V +2 cov(U,V)

 \Rightarrow

(8) writt the statement of binomial distribution, find the mean and voutance of the above distribution

(P+q=1)

μ! = E(x) = ε + nCr prq n-r

= 0 9 n + n 0 p 9 n 1 + ... 2 p n - r

= n p 9 n - 1 + ... 1 m - r

 $= n p \left(q^{n-1} + \frac{m-1}{n} c_1 p q^{n-1} + \dots p^{n-1}\right)$ $= n p \left(p+q\right)^{n-1}$

 $= np \qquad (p+q=1)$

μι' = E(x2) = E γ2η Cr pr q n-r

= \(\begin{align*} & \begin{align*} & \text{Tr} & \te

= $n + n(n-1)p^2 \left[\sum_{r=0}^{n-1} C_{n-2} p^n q^{n-r} \right]$

Variance = E(x2) - (E(x)) = 12px 14101) 92 3 13p2

= H1 = 0 (alway)

12 = 42 - (HI) -

= np q

~2 = µ1 = npq