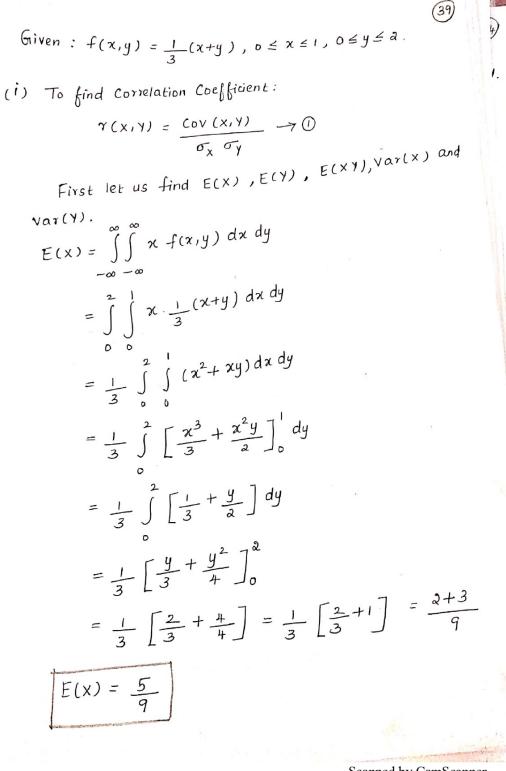


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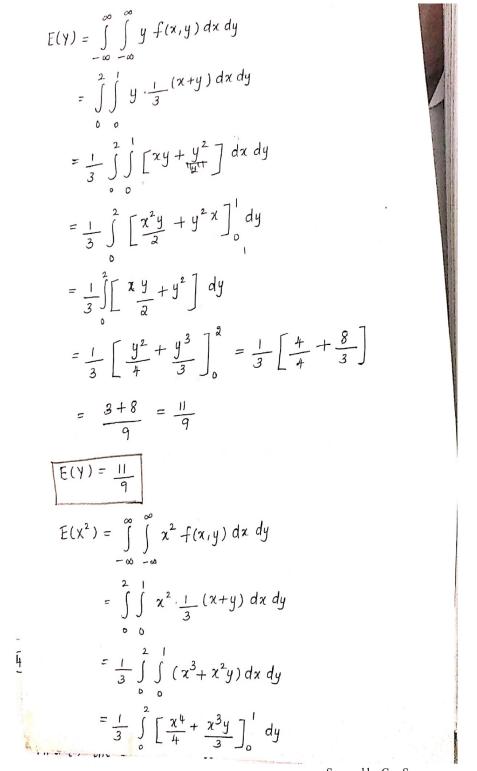
S.GOWRI/AP/MATHEMATICS





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$$E(x^{2}) = \frac{1}{3} \int_{0}^{2} \left[\frac{1}{4} + \frac{y}{3}\right] dy$$

$$= \frac{1}{3} \left[\frac{y}{4} + \frac{y^{2}}{6}\right]_{0}^{2}$$

$$= \frac{1}{3} \left[\frac{2}{4} + \frac{y}{6}\right] = \frac{1}{3} \left[\frac{1}{2} + \frac{2}{3}\right]$$

$$= \frac{1}{3} \left[\frac{3+4}{6}\right] = \frac{1}{3} \left[\frac{1}{2} + \frac{2}{3}\right]$$

$$E(y^{2}) = \int_{0}^{\infty} \int_{0}^{\infty} y^{2} f(x,y) dx dy$$

$$= \int_{0}^{2} \int_{0}^{1} y^{2} \frac{1}{3} (x+y) dx dy$$

$$= \int_{0}^{2} \int_{0}^{1} (y^{2}x + y^{3}) dx dy$$

$$= \frac{1}{3} \int_{0}^{2} \left[\frac{y^{2}x^{2}}{2} + y^{3}x\right]_{0}^{1} dy$$

$$= \frac{1}{3} \int_{0}^{2} \left[\frac{y^{2}}{2} + y^{3}\right]_{0}^{4} dy$$

$$= \frac{1}{3} \left[\frac{y^{3}}{6} + \frac{y^{4}}{4}\right]_{0}^{2} = \frac{1}{3} \left[\frac{8}{6} + \frac{16}{4}\right]$$

$$= \frac{1}{3} \left[\frac{2}{3} + 4\right] = \frac{1}{3} \left[\frac{4+12}{8}\right] = \frac{16}{9}$$

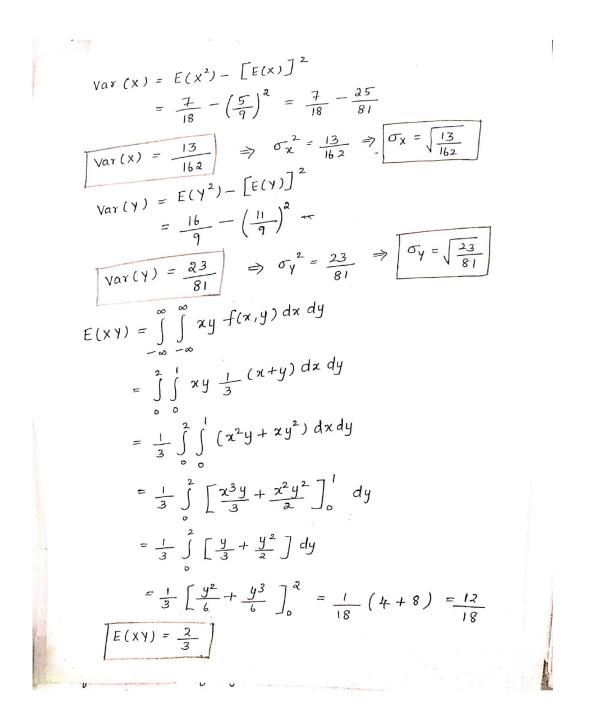
$$E(y^{2}) = \frac{16}{9}$$





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$$Cov(X,Y) = E(XY) - E(X)E(Y)$$

$$= \frac{2}{3} - \frac{5}{9} \cdot \frac{11}{9}$$

$$= \frac{2}{3} - \frac{55}{81} = -\frac{1}{81}$$

$$Cov(X,Y) = -\frac{1}{81}$$

$$Cov(X,Y) = \frac{-1}{81}$$

$$= -\frac{1/81}{\sqrt{\frac{13}{162} \times \frac{23}{81}}} = -\sqrt{\frac{2}{299}}$$

$$\frac{1}{\sqrt{\frac{13}{162} \times \frac{23}{81}}}$$

$$\frac{1}{7} = -\sqrt{\frac{2}{299}} = -0.0818$$

$$\frac{1}{7} = -\sqrt{\frac{2}{299}} = -0.0818$$

$$Equation of the line of regression of X on Y is.$$

$$X - \overline{X} = Y \cdot \frac{\sigma_X}{\sigma_Y} (Y - \overline{Y})$$

$$\sqrt{\frac{23}{81}}}$$

$$\frac{X - 5}{9} = (-0.0818) \sqrt{\frac{3}{162}} (Y - \frac{11}{9})$$

$$\frac{X - 5}{9} = (-0.0435) (Y - \frac{11}{9})$$

$$Equation of the line of regression of Y on X is,$$

$$Y - \overline{Y} = Y \cdot \frac{\sigma_Y}{\sigma_X} (X - \overline{X})$$