

Exam P

Problem 110. (Multivariate Probability Dist'n)

$$f(x,y) = \begin{cases} 24xy & 0 < x < 1 \\ & 0 < y < 1-x \\ 0 & \text{o.w.} \end{cases}$$

o.w.

$$\Pr(Y < X \mid X = 1/3)$$

$$= \frac{\Pr(Y < X \cap X = 1/3)}{\Pr(X = 1/3)}$$

$$= \frac{\int_0^{1/3} f_{x,y}(1/3, y) dy}{\int_0^{2/3} f_{x,y}(1/3, y) dy}$$

$$= \frac{\int_0^{1/3} 8y dy}{\int_0^{2/3} 8y dy}$$

$$= \frac{4/9}{16/9}$$

$$= 1/4$$

Choose C