

Câu 1 (2đ)

$$P(0,0) = 0.2, \quad P(1,0) = 0.3, \quad P(0,1) = 0.5, \quad P(1,1) = 0$$

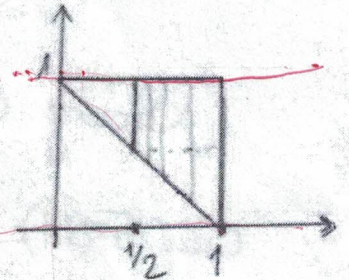
$$P(X=1|Y=0) = \frac{P(X=1, Y=0)}{P(Y=0)} = \frac{0.3}{0.5} = 0.6$$

Câu 2 (3đ)

$$1đ \quad a) \quad P(X+Y \geq 1) = \int_0^1 \int_{1-y}^1 6x^2y \, dx \, dy = \frac{9}{10}$$

$$1đ \quad b) \quad P(X \geq \frac{1}{2} | X+Y \geq 1) = \frac{P(X \geq \frac{1}{2} \cap X+Y \geq 1)}{P(X+Y \geq 1)}$$

$$= \frac{\int_{\frac{1}{2}}^1 \int_{1-x}^1 6x^2y \, dy \, dx}{9/10} = \frac{33/40}{9/10} = 0.91667$$



$$1đ \quad c) \quad f_{X|Y=\frac{1}{2}}(x) = \frac{f(x, \frac{1}{2})}{f_Y(\frac{1}{2})} = \frac{3x^2}{f_Y(\frac{1}{2})}$$

$$f_Y(y) = \int_{-\infty}^{\infty} f(x,y) \, dx = \int_0^1 6x^2y \, dx = y(2x^3|_0^1) = 2y$$

$$f_{X|Y=\frac{1}{2}}(x) = \frac{3x^2}{1} = 3x^2 \quad 0.5đ$$

$$E(X|Y=\frac{1}{2}) = \int_{-\infty}^{\infty} x f_{X|Y=\frac{1}{2}}(x) \, dx = \int_0^1 3x^3 \, dx = \frac{3}{4} x^4|_0^1 = \frac{3}{4} \quad 0.5đ$$

Câu 3: (2đ)

$$\hat{p} = \frac{112}{178} = 0.6292, \quad n = 178, \quad \alpha = 0.05 \quad 0.5đ$$

$$H_0: p \leq 0.6 \quad \text{hoặc} \quad H_0: p = 0.6 \quad 0.5đ$$

$$H_1: p > 0.6$$

$$Z = \frac{(0.629 - 0.6) \sqrt{178}}{\sqrt{0.6(1-0.6)}} = 0.795 \quad 0.5đ$$

$$Z_{\alpha} = 1.645 > Z$$



Câu 4. (2đ)

$$n = 256, \bar{x} = 16425, s = 226.8281, 1 - \alpha = 95\% \quad (0.5đ)$$

$$z_{\alpha/2} = \underline{1.96} \quad 0.5đ \quad 27,79$$

$$E = \underline{1.69} \cdot \frac{226.8281}{\sqrt{256}} = 23.96 \quad 0.5đ$$

$$\text{Khoảng UL: } [\underline{1618.54}, \underline{1666.46}] \quad 0.5đ$$

~~1614, 21~~      ~~1670, 29~~

Câu 5 (1đ)  $r = 0.923$       0.5đ

$$Y = 0.328Z + 14.967 \quad 0.5đ$$