Pauta P3 - C2

a) 3pts

$$X_i = \begin{cases} -1 & \Rightarrow 1/6 \\ 0 & \Rightarrow 3/6 \\ +1 & \Rightarrow 2/6 \end{cases} \quad +0{,}3 \qquad \boxed{X = \sum_{i=1}^{n} X_i}$$

- $E(X) = \sum_{i=1}^{n} E(X_i) = n \cdot E(X_i) = n\left(-1 \cdot \frac{1}{6} + 0 \cdot \frac{3}{6} + 1 \cdot \frac{2}{6}\right) = \frac{n}{6} \,//$ $+1{,}0$

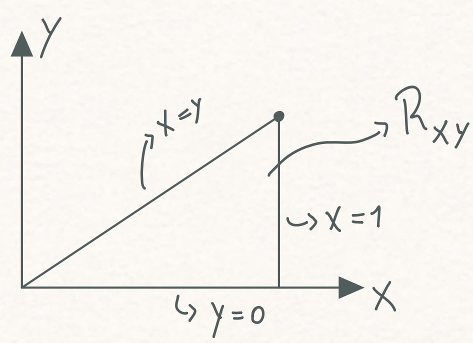
- $E(X^2) = E\left(\sum_{i=1}^{n} X_i \sum_{j=1}^{n} X_j\right) = \sum_{i=1}^{n}\sum_{j=1}^{n} E(X_i X_j) = \sum_{i \neq j}\sum E(X_i)E(X_j) + \sum_{i=1}^{n} E(X_i^2)$

$\Rightarrow \quad = (n^2 - n) \cdot \frac{1}{36} + \left[1 \cdot 1/6 + 0 \cdot 1/2 + 1 \cdot 2/6\right] \cdot n = \frac{n^2 - n + 18n}{36} \,//$ $+0{,}7$

Entonces se tiene que

- $Var(X) = \frac{n^2 + 17n}{36} - \frac{n^2}{36} = \frac{17n}{36} \,//$ $+1{,}0$

b) 3pts



$$\Rightarrow \quad f_{XY} = \begin{cases} c & \text{si } (x,y) \in R_{xy} \\ 0 & \text{si no} \end{cases}$$

tenemos que

$\Rightarrow \int_0^1 \int_y^1 c \, dx\, dy = c \int_0^1 1 - y \, dy = c \cdot [1 - 1/2]$

$= \frac{c}{2} \overset{!}{=} 1 \quad \Rightarrow \quad c = 2$ $+0{,}7$

$+0{,}3$

- $f_x = \int_0^x 2\,dy = 2x \quad \wedge \quad f_y = \int_y^1 2\,dx = 2(1-y) \Rightarrow$ como $f_x \cdot f_y \neq f_{xy}$

$\Rightarrow$ no son independientes

$+0{,}5$

$\Rightarrow f_{x|y} = \dfrac{f_{xy}}{f_y} = \dfrac{2}{2(1-y)} = \dfrac{1}{1-y}$ $+0{,}5$

Luego $E(x|y) = \int_{-\infty}^{\infty} x\, f_{x|y}\, dx \Rightarrow \int_y^1 \dfrac{x}{1-y}\,dx = \dfrac{1}{2(1-y)} \cdot x^2 \Big|_y^1 = \dfrac{1+y}{2}$ // $+1{,}0.$