

i) $X, Y \sim \text{Unif}(0, 1)$

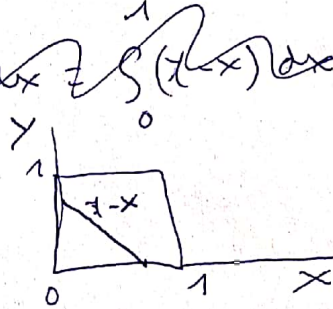
$$f_X(t) = \begin{cases} 1 & \text{si } t \in [0, 1] \\ 0 & \text{si } t \notin [0, 1] \end{cases}$$

$$F_2(t) = P(X+Y \leq t) = \begin{cases} 0 & \text{si } t \leq 0 \\ 1 & \text{si } t \geq 2 \\ \int_{-\infty}^{\infty} \int_{-\infty}^{t-x} f_{X,Y}(x,y) dy dx & \text{otherwise} \end{cases}$$

Variables independientes

$$= \int_{-\infty}^{\infty} \int_{-\infty}^{t-x} f_X(x) f_Y(y) dy dx = \int_0^1 \int_0^{t-x} dy dx = \int_0^1 (t-x) dx$$

$$= \left[tx - \frac{x^2}{2} \right]_0^1 = t - \frac{1}{2}$$



$$= \int_0^1 \int_0^{\min(1, t-x)} dy dx = \int_0^1 \min(1, t-x) dx = \begin{cases} \int_0^1 1 dx = x \Big|_0^1 = 1 & \text{if } t \geq 1 \\ \int_0^1 (t-x) dx = tx - \frac{x^2}{2} \Big|_0^1 = t - \frac{1}{2} & \text{if } t < 1 \end{cases}$$