## OLAS MOOR

## MyS

Practico 3

Pag. 1

## Practico 3. Números Alentorios y Metodo de Monte Carlo

(2)a) Overenas ver P(X7,1). Para ello, vamos a ir hacierdo observaciones:

$$\int_{0}^{2} \int_{0}^{0} \left( x \, d\lambda \, dx \right) = \left[ \frac{5}{x} \, dx \right]_{0}^{0} = \frac{5}{1}$$

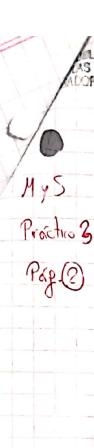
$$= \int_{0}^{1} \int_{0}^{x} F_{w_{1}}(y) \cdot F_{w_{2}} * F_{w_{3}}(x-y) dy dx = \int_{0}^{1} \int_{0}^{x} F_{w_{1}}(y) \int_{-\infty}^{\infty} F_{w_{2}}(z) F_{w_{3}}((x-y)-z) dz dy dx =$$

$$= \int_{1}^{6} \left[ x \lambda - \frac{5}{\lambda_{5}} \right]_{x}^{6} q x = \left[ \frac{5}{\lambda_{5}} q x = \left[ \frac{6}{\lambda_{3}} \right]_{1}^{6} = \frac{6}{1}$$

Luga, tenens que 
$$P(XZI) = \frac{1}{2} \cdot (1 - \frac{1}{2}) + \frac{1}{2} \cdot (1 - \frac{1}{6}) = \frac{2}{3} = 0,6$$

= P((1-W1)+(1-W2)+(1-W3)>1). Ahora, stan Xi=1-Wi pora i=1,2,3, podernos ver que X; ~ U(0,1), por lo que tenens T(X,+X2+X3≥1) que por (ej.2) saherus que es 5/6. Luga, P(x < e) = 1 . 1 + 2 . 5 = 8 = 0,8 (1) Considerans Ci al evento de ir a la i-esima cisa y a Xi a la via del trempo a esparor pora esa caja, dinde i= 1,2,3 y se comple que: \* P(C1) = 0,4 , P(C2) = 0,32 , P(C3) = 0,28 \* \* X, ~ E (V3) , X2~ E (V4) , X3 ~ E (V5) = 0,4 \ \ \frac{1}{3}e^{-1/3}xdx + 0,35 \ \ \frac{1}{4}e^{-1/4}xdx + 0,28 \ \ \frac{1}{5}e^{-1/5}xdx = =0,4.[-e-1/3×]4+0,32.[-e-1/4×]4+0,28.[-e-1/5×]4 20,4.0,74+0,32.0,63+0,28.0,55= =0,6516 (b) See X la v.a. que reprenta el trempo de teder los anjos, tenenos:  $P(C_i \mid x \ge 4) = P(x \ge 4 \mid C_i) \cdot \frac{P(C_i)}{P(x \ge 4)} = P(x \ge 4 \mid C_i) \cdot \frac{P(C_i)}{1 - P(x \le 4)} = \begin{pmatrix} 0 & \lambda_i e^{\lambda_i x} \Delta x \cdot P(C_i) \\ \frac{1}{1 - P(x \le 4)} & \frac{1}{1 - P(x \le 4)} \end{pmatrix}_{i} \begin{pmatrix} 0 & \lambda_i e^{\lambda_i x} \Delta x \cdot P(C_i) \\ \frac{1}{1 - P(x \le 4)} & \frac{1}{1 - P(x \le 4)} \end{pmatrix}_{i}$  $= \left[ -e^{-\lambda (x)} \right]_{4}^{\infty} \cdot \frac{P(C_{1})}{1 - P(x \in 4)} = e^{-4\lambda (x)} \cdot \frac{P(C_{1})}{1 - P(x \in 4)} \approx e^{-4\lambda (x)} \cdot \frac{P(C_{1})}{1 - O_{1}(S \in 6)} = e^{-4\lambda (x)}$ O,3026 31 031 Luga, entones:

 $P(C_{c}|X \geqslant Y) \approx \begin{cases} 0.3379, & \text{s.i. } c \neq 2 \\ 0.3611, & \text{s.i. } c \neq 3 \end{cases}$ Escapeado



(5) (a) 
$$\int_{0}^{1} (1-x^{2})^{3/2} dx = \left[\frac{1}{8} \left(3 \text{ arcsen}(x) + x \sqrt{1-x^{2}} \left(5-2x^{2}\right)\right)\right]_{0}^{1} = \frac{3 \text{ if }}{16} \approx 0,589$$

$$\bigcirc \int_{0}^{\infty} x(1+x^{2})^{-2} dx = \left[ -\frac{1}{2(x^{2}+1)} \right]_{0}^{\infty} = \frac{1}{2} = 0,5$$

$$[1-P(2\leq N_0\leq 5)] \cdot P(N_1 \geq 4) + P(2\leq N_0\leq 5) \cdot P(N_1 + N_2 \geq 7) =$$

$$= (1-4) \cdot \frac{3}{2} + 4 \cdot \frac{6.7}{2} = 5 - 0.5.$$

$$= \left(1 - \frac{4}{6}\right) \cdot \frac{3}{6} + \frac{4}{6} \cdot \frac{6 \cdot 7}{6^2} = \frac{5}{9} = 0, \hat{5}.$$