

10 de octubre de 2016.

- Repaso general previo al 1^{er} examen

x	0	1	2	3
$P(x)$	0.2	0.4	0.3	0.1

$$\text{VAD. } \left\{ \begin{array}{l} V(x) = 0.81 \\ \therefore S = 0.9 \end{array} \right.$$

$$\begin{aligned} E(X) &= (0)(0.2) + (1)(0.4) + (2)(0.3) + (3)(0.1) \\ &= 0.4 + 0.6 + 0.3 \Rightarrow 1.3 \end{aligned}$$

$$\begin{aligned} V(x) &= (0 - 1.3)^2(0.2) + (1 - 1.3)^2(0.4) + (2 - 1.3)^2(0.3) + (3 - 1.3)^2(0.1) \\ &= (1.69)(0.2) + (0.09)(0.4) + (0.49)(0.3) + (2.89)(0.1) \\ &= (0.338) + (0.036) + (0.147) + 0.289 \end{aligned}$$

$$\mathbb{E}(X) = \sum_{i=0}^{\infty} x_i P(x_i) \quad \text{VAD}$$

$$V(X) = \sum_{i=0}^{\infty} (x_i - \mathbb{E}(X))^2 P(x_i)$$

$$S = \sqrt{V(X)}$$

$$\text{Verd. } \Phi = \quad q = 1 - p$$

$$\cdot F(X=x) = \binom{n}{k} p^k q^{n-k}$$

$$\mathbb{E}(X) = np$$

$$V(X) = npq \quad S = \sqrt{V(X)}$$

Distr. Probabilidades

Binomial

20 Esf. 15 blancos y 5 verdes $P(\phi) = 0$
 $P(s) = 1$

$$p = \frac{15}{20} = 0.75 \quad q = \frac{5}{20} \Rightarrow 1 - p \Rightarrow 1 - 0.75 = 0.25$$

$$S = \{ \text{BBBBB } \text{BBBBB } \text{BBBBB } \text{VVVVV} \}$$

$$P(B) = \frac{1}{20} \quad p = 0.75 \quad q = 0.25$$

$$n = 29$$

$$k = 20$$

$$P(X=20) = \binom{29}{20} p^{20} q^{(29-20)}$$

$$= \frac{29!}{20! (9!)} (0.75)^{20} (0.25)^9$$

$$= \frac{29 \times 28 \times 27 \times 26 \times 25 \times 24 \times 23 \times 22 \times 21}{9!} (0.75)^{20} (0.25)^9$$

$$P(X \geq 20) = P(X=20) + P(X=21) + P(X=22) + \dots + P(X=29)$$

Prob. ACUMULADA BINOMIAL

$$P(X \geq 20) = 1 - P_A(X=19)$$

$$P(X \geq 20) = 1 - 0,1663$$

$$P_A(X=20) = 0,2875$$

$$P_A(X=19) = 0,1663$$

$$P(X=20) = 0,1212$$

83,37%

12,12%

$$\mathbb{E}(X) = (20)(0.75) = 15$$

$$V(X) = (20)(0.75)(0.25) = 3.75$$

$$\sigma = 1.93$$

Teorema Bayes

$$P(A/B) = \frac{P(A \cap B)}{P(B)}$$

$$P(I/B) = \frac{\frac{5}{75}}{\frac{15}{75}} = \frac{5}{15} = 0.333$$

$$P(B/I) = \frac{\frac{5}{75}}{\frac{30}{75}} = \frac{5}{30} = 0.166$$