Fórmulas para el primer parcial

- $$f(x) = \binom{n}{x} p^x (1-p)^{n-x} \qquad \mathbb{E}(X) = np \qquad \mathbb{V}(X) = np(1-p)$$

- $$f(x) = \frac{e^{-\lambda}\lambda^x}{x!} \qquad \mathbb{E}(X) = \lambda \qquad \mathbb{V}(X) = \lambda$$

- $$f(x) = \binom{x-1}{r-1} p^r (1-p)^{x-r} \qquad \mathbb{E}(X) = \frac{r}{p} \qquad \mathbb{V}(X) = \frac{r(1-p)}{p^2}$$

- $$f(x) = p(1-p)^{x-1} \qquad \mathbb{E}(X) = \frac{1}{p} \qquad \mathbb{V}(X) = \frac{1-p}{p^2}$$

- $$f(x) = \frac{\binom{M}{x}\binom{N-M}{n-x}}{\binom{N}{n}} \qquad \mathbb{E}(X) = n\frac{M}{N} \qquad \mathbb{V}(X) = n\frac{M}{N}\left(1-\frac{M}{N}\right)\frac{N-n}{N-1}$$

- $$f(x) = \begin{cases} \lambda e^{-\lambda x} & \text{si } x \geq 0 \\ 0 & \text{c.c.} \end{cases} \quad F(x) = \begin{cases} 1 - e^{-\lambda x} & \text{si } x \geq 0 \\ 0 & \text{c.c.} \end{cases} \qquad \mathbb{E}(X) = \frac{1}{\lambda} \qquad \mathbb{V}(X) = \frac{1}{\lambda^2}$$

- $$f(x) = \begin{cases} \dfrac{1}{b-a} & \text{si } a \leq x \leq b \\ 0 & \text{c.c.} \end{cases} \quad F(x) = \begin{cases} 0 & \text{si } x < a \\ \dfrac{x-a}{b-a} & \text{si } a \leq x < b \\ 1 & \text{si } x \geq b \end{cases} \qquad \mathbb{E}(X) = \frac{a+b}{2} \qquad \mathbb{V}(X) = \frac{(b-a)^2}{12}$$

Derivadas de funciones básicas

- $(e^x)' = e^x$
- $(x^n)' = nx^{n-1}$
- $(\text{Constante})' = 0$
- $(\ln x)' = \frac{1}{x}$

Reglas de derivación

- $(f(x) + g(x))' = f'(x) + g'(x)$
- $(f(x) \cdot g(x))' = f'(x)g(x) + f(x)g'(x)$
- $\left(\dfrac{f(x)}{g(x)}\right)' = \dfrac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}$
- $(f(g(x)))' = f'(g(x)) \cdot g'(x)$

Integrales de funciones básicas

- $\displaystyle\int_a^b x^n \, dx = \left.\frac{x^{n+1}}{n+1}\right|_a^b$
- $\displaystyle\int_a^b 1 \, dx = x|_a^b$