

# Lois de probabilité usuelles

## Question 1/5

$$X \sim \mathcal{U}(n)$$

## Réponse 1/5

$$X(\Omega) = \llbracket 1, n \rrbracket$$

$$\mathbb{P}(X = k) = \frac{1}{n}$$

$$\mathbb{E}(X) = \frac{n+1}{2}$$

$$\mathbb{V}(X) = \frac{n^2-1}{12}$$

$$G_X(t) = \frac{1}{n} \frac{t^{n+1} - t}{t - 1}$$

## Question 2/5

$$X \sim \mathcal{P}(\lambda)$$

## Réponse 2/5

$$X(\Omega) = \mathbb{N}$$

$$\mathbb{P}(X = k) = e^{-\lambda} \frac{\lambda^k}{k!}$$

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

$$\mathbb{V}(X) = \lambda$$

$$G_X(t) = e^{\lambda(t-1)}$$

## Question 3/5

$$X \sim \mathcal{B}(n, p)$$

## Réponse 3/5

$$X(\Omega) = \llbracket 0, n \rrbracket$$

$$\mathbb{P}(X = k) = \binom{n}{k} p^k q^{n-k}$$

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

$$\mathbb{V}(X) = \frac{n^2 - 1}{12}$$

$$G_X(t) = \frac{1}{n} \frac{t^n - 1}{t - 1}$$

## Question 4/5

$$X \sim \mathcal{B}(p)$$



## Réponse 4/5

$$X(\Omega) = \{0, 1\}$$

$$\mathbb{P}(X = 1) = p$$

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

$$\mathbb{V}(X) = pq$$

$$G_X(t) = pt + q$$

## Question 5/5

$$X \sim \mathcal{G}(p)$$

## Réponse 5/5

$$X(\Omega) = \mathbb{N}^*$$

$$\mathbb{P}(X = k) = pq^{k-1}$$

$$\mathbb{E}(X) = \frac{1}{p}$$

$$\mathbb{V}(X) = \frac{q}{p^2}$$

$$G_X(t) = \frac{pt}{1 - qt}$$