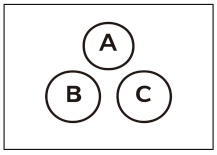
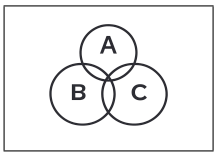
Poisson Random Variable

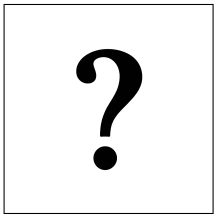


$\lambda = 1$



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

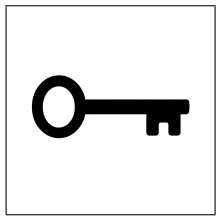
$P(X = 0) = e^{-1}\frac{1^0}{0!} = e^{-1} \approx \boxed{0.37}$



$P(X = 1|X \leq 1) = 0.8$

$\lambda = ?$

Poisson Random Variable



$P(X = 1|X \leq 1) = 0.8$
$\lambda = ?$

$P(X = 1 \mid X \leq 1) = \frac{P(X=1)}{P(X=0)+P(X=1)}$
$P(X = 1 \mid X \leq 1) = \frac{\lambda e^{-\lambda}}{e^{-\lambda}+\lambda e^{-\lambda}}$
$P(X = 1 \mid X \leq 1) = \frac{\lambda}{1+\lambda} = 0.8$

$\frac{\lambda}{1+\lambda} = 0.8$
$\lambda = 0.8(1 + \lambda)$
$\lambda - 0.8\lambda = 0.8$
$0.2\lambda = 0.8$
$\lambda = \boxed{4}$