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Discrete Distribution Geometric Variable

M

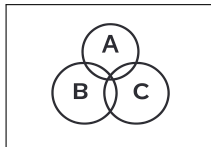


$$p = 0.25$$

$$X = \{1, 2, 3, \dots\}$$

$$PMF = ?$$

$$E[X] = ?$$



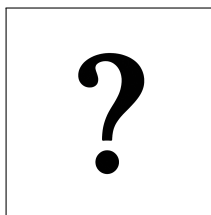
$$P(X = x) = (1 - p)^{x-1}p$$

$$P(X = 1) = 0.25$$

$$P(X = 2) = 0.75(0.25) = 0.1875$$

$$P(X = 3) = 0.75^2(0.25) = 0.1406$$

$$E[X] = 1/p = 1/0.25 = \boxed{4}$$



$$X = \{1, 2, \dots\}$$

$$p = 0.04$$

$$E[X] = ?$$

$$\text{Var}[X] = ?$$

$$\sigma_X = ?$$

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$$X = \{1, 2, \dots\}$$

$$p = 0.04$$

$$E[X] = ?$$

$$\text{Var}[X] = ?$$

$$\sigma_X = ?$$

$$E[X] = \frac{1}{p} = \frac{1}{0.04} = \boxed{25}$$

$$\text{Var}[X] = \frac{1-p}{p^2} = \frac{0.96}{(0.04)^2} = \boxed{600}$$

$$\sigma_X = \sqrt{\text{Var}[X]} = \sqrt{600} \approx \boxed{24.495}$$