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Discrete Distribution Bernoulli Trials

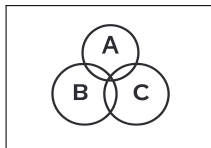
G



$$n = 2$$

$$p = 0.50$$

$$k = 1$$

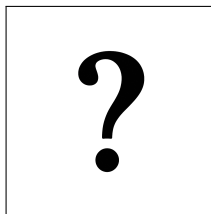


$$P(X = k) = \binom{n}{k} (p)^k (1 - p)^{n-k}$$

$$P(X = 1) = \binom{2}{1} (0.50)^1 (0.50)^1$$

$$P(X = 1) = 2 \times 0.50 \times 0.50$$

$$P(X = 1) = \boxed{0.50}$$



$$n = 20$$

$$p = 0.03$$

$$P(X \geq 2) = ?$$

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$$n = 20$$

$$p = 0.03$$

$$P(X \geq 2) = ?$$

$$P(X \geq 2) = 1 - P(X < 2) = 1 - [P(X = 0) + P(X = 1)]$$

$$P(X = 0) = \binom{20}{0} (0.03)^0 (0.97)^{20} = 0.97^{20}$$

$$P(X = 1) = \binom{20}{1} (0.03)^1 (0.97)^{19} = 20 \cdot 0.03 \cdot 0.97^{19}$$

$$P(X \geq 2) = 1 - [0.97^{20} + 20 \cdot 0.03 \cdot 0.97^{19}]$$

$$0.97^{20} \approx 0.5437$$

$$20 \cdot 0.03 \cdot 0.97^{19} \approx 0.3364$$

$$P(X \geq 2) \approx 1 - (0.5437 + 0.3364) \approx 1 - 0.8801 \approx 0.1199$$