

G

Negative Binomial Random Variable

G



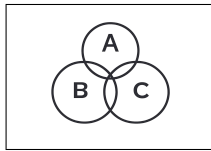
$$p = 0.5$$

$$r = 2$$

$$n = 3$$

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

$$P(X = 3) = ?$$

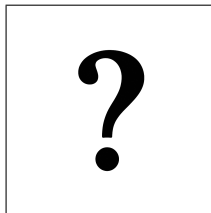


$$P(X = 3) = \binom{3-1}{2-1} (0.5)^2 (0.5)^{3-2}$$

$$P(X = 3) = \binom{2}{1} (0.5)^3$$

$$P(X = 3) = 2 \times 0.125$$

$$P(X = 3) = \boxed{0.25}$$



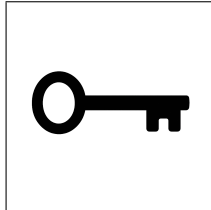
$$p = 0.6$$

$$r = 2$$

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$$p = 0.6$$
$$r = 2$$

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

$$P(X = 7) = \binom{7-1}{2-1} (0.6)^2 (0.4)^{7-2}$$

$$P(X = 7) = \binom{6}{1} \times 0.36 \times 0.4^5$$

$$P(X = 7) = 6 \times 0.36 \times 0.01024$$

$$P(X = 7) \approx \boxed{0.0221}$$