

D

Negative Binomial Random Variable

D



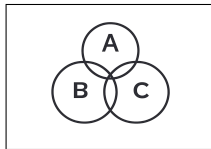
$$p = 0.5$$

$$r = 2$$

$$n = 3$$

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

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

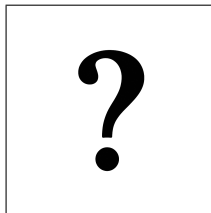


$$P(X = 3) = \binom{3-1}{2-1} (0.5)^2 (0.5)^{3-2}$$

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

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

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



$$p = \frac{1}{6}$$

$$r = 4$$

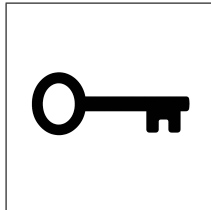
$$X = \{1, 2, 3, 4, 5, 6\}$$

$$E[X] = ?$$

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

D

Negative Binomial Random Variable

D

$$p = \frac{1}{6}$$
$$r = 4$$
$$X = \{1, 2, 3, 4, 5, 6\}$$
$$E[X] = ?$$
$$\text{Var}[X] = ?$$

$$E[X] = \frac{r}{p} = \frac{4}{1/6} = \boxed{24}$$

$$\text{Var}[X] = \frac{r(1-p)}{p^2} = \frac{4 \cdot (5/6)}{(1/6)^2} = \boxed{120}$$