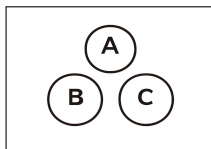


16 Discrete Distribution Expected Value Function

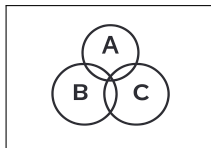
G



$$Y = 20 - 2X$$

$$E(X) = 6$$

$$E(Y) = ?$$

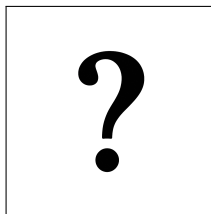


$$E(Y) = E(20 - 2X)$$

$$E(20 - 2X) = E(20) - 2E(X)$$

$$E(20) = 20$$

$$E(Y) = 20 - 2(6) = 20 - 12 = 8$$



$$P(X = 1) = \frac{1}{30}$$

$$P(X = 2) = \frac{3}{10}$$

$$P(X = 3) = \frac{1}{2}$$

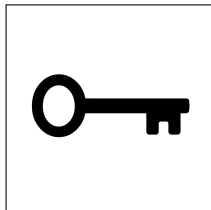
$$P(X = 4) = \frac{1}{6}$$

$$E(X) = ?$$

$$E(X^2) = ?$$

16 Discrete Distribution Expected Value Function

G



$$P(X = 1) = \frac{1}{30}$$

$$P(X = 2) = \frac{3}{10}$$

$$P(X = 3) = \frac{1}{2}$$

$$P(X = 4) = \frac{1}{6}$$

$$E(X) = ?$$

$$E(X^2) = ?$$

$$E(X) = \sum x \cdot P(x)$$

$$E(X) = 1 \cdot \frac{1}{30} + 2 \cdot \frac{3}{10} + 3 \cdot \frac{1}{2} + 4 \cdot \frac{1}{6}$$

$$E(X) = \frac{1}{30} + \frac{6}{10} + \frac{3}{2} + \frac{4}{6}$$

$$E(X) = \frac{1}{30} + \frac{18}{30} + \frac{45}{30} + \frac{20}{30} = \frac{84}{30} = \boxed{\frac{14}{5}}$$

$$E(X^2) = \sum x^2 \cdot P(x)$$

$$E(X^2) = 1^2 \cdot \frac{1}{30} + 4 \cdot \frac{3}{10} + 9 \cdot \frac{1}{2} + 16 \cdot \frac{1}{6}$$

$$E(X^2) = \frac{1}{30} + \frac{12}{10} + \frac{9}{2} + \frac{16}{6}$$

$$E(X^2) = \frac{1}{30} + \frac{36}{30} + \frac{135}{30} + \frac{80}{30} = \frac{252}{30} = \boxed{8.4}$$