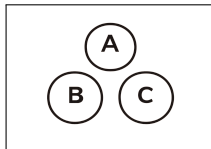


16 Discrete Distribution Expected Value Function

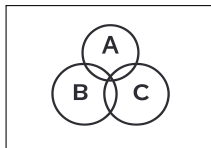
B



$$Y = 20 - 2X$$

$$E(X) = 6$$

$$E(Y) = ?$$

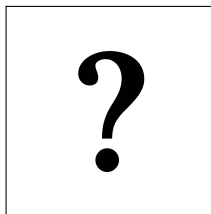


$$E(Y) = E(20 - 2X)$$

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

$$E(20) = 20$$

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



$$P(X = -1) = 2c$$

$$P(X = 1) = 3c$$

$$P(X = 2) = 4c$$

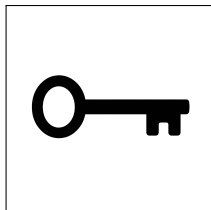
$$c = ?$$

$$E(X) = ?$$

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

16 Discrete Distribution Expected Value Function

B



$$P(X = -1) = 2c$$

$$P(X = 1) = 3c$$

$$P(X = 2) = 4c$$

$$c = ?$$

$$E(X) = ?$$

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

$$2c + 3c + 4c = 9c = 1 \Rightarrow c = 1/9$$

$$P(X = -1) = 2/9$$

$$P(X = 1) = 3/9$$

$$P(X = 2) = 4/9$$

$$E(X) = \sum x \cdot p(x) = (-1) \cdot \frac{2}{9} + 1 \cdot \frac{1}{3} + 2 \cdot \frac{4}{9}$$

$$E(X) = -\frac{2}{9} + \frac{3}{9} + \frac{8}{9} = \frac{9}{9} = 1$$

$$E(X^2) = \sum x^2 \cdot p(x) = (-1)^2 \cdot \frac{2}{9} + 1^2 \cdot \frac{1}{3} + 2^2 \cdot \frac{4}{9}$$

$$E(X^2) = \frac{2}{9} + \frac{3}{9} + \frac{16}{9} = \frac{21}{9} = \frac{7}{3}$$