

$$X = \{\text{heads}, \text{tails}\}$$

$$P(X = \text{tails}) = \frac{1}{2} = 0.5 = P(H)$$

$$P(X = \text{heads}) = \frac{1}{2} = 0.5 = P(T)$$

$$P(T) + P(H) = 1$$

$$\bullet \sum_x P(X=x) = \underline{1}$$

$$\left. \begin{array}{l} \bullet P(X=x) \geq 0 \\ \bullet P(X=x) \leq 1 \end{array} \right\} 0 \leq P(X=x) \leq 1$$

$$P(X=x) = 0 \longrightarrow \text{IMPOSSIBLE!}$$

$$P(X=x) = 1 \longrightarrow \text{CERTAIN!}$$

$$X = \{\text{heads}, \text{tails}\}$$

$$P(X = \text{heads}) = 0.6 \quad P(X = \text{tails}) = ?$$

$$\underline{P(T)} = \underline{1} - P(H) = 1 - 0.6 = \underline{0.4}$$

$$X = \{H, T\} \quad Y = \{1, 2, 3, 4, 5, 6\}$$

AND

$$P(X = H, Y = 2) = ?$$

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

$$P(Y = 2) = \frac{1}{6}$$

$$P(H, 2) = P(H \cap 2) = \frac{1}{2} \cdot \frac{1}{6} = \frac{1}{12}$$

PRODUCT

OR

$$P(X = H \cup Y = 2)$$

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

$$P(Y = 2) = \frac{1}{6}$$

$$P(H \cup 2) = \frac{1}{2} + \frac{1}{6} = \frac{2}{3}$$

SUM