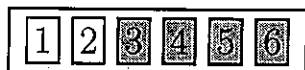


1. A box contains six tickets, two white and four gray, numbered as shown below. You take one ticket. Let A be the event "Your ticket is gray." Let B be the event "Your ticket is odd."



Are A and B independent or dependent? Explain.

$$P(A) = \frac{4}{6} = \frac{2}{3} \quad (\text{because 4 out of 6 tickets are gray})$$

$$P(A|B) = \frac{2}{3} \quad (\text{because 2 out of 3 odd tickets are gray})$$

Therefore $P(A) = P(A|B)$, so A & B are independent

2. A shuffled standard 52-card deck is placed on a table. Find the probability that the top card is red and the bottom card is a club.

Consider events: A : "top card is red"

B : "bottom card is club."

$$\text{We seek } P(A \cap B) = P(A) \cdot P(B|A) = \frac{26}{52} \cdot \frac{13}{51} = \frac{13}{102}$$

$$\approx \boxed{12.75\%}$$

1. A box contains six tickets, three white and three gray, numbered as shown below. You take one ticket. Let A be the event "Your ticket is gray." Let B be the event "Your ticket is odd."



Are A and B independent or dependent? Explain.

$$P(A) = \frac{3}{6} = \frac{1}{2} \quad (\text{because 3 of 6 tickets are gray})$$

$$P(A|B) = \frac{1}{3} \quad (\text{because 1 of 3 odd tickets is gray})$$

Therefore $P(A) \neq P(A|B)$ so A & B are dependent

2. A shuffled standard 52-card deck is placed on a table. Find the probability that both the top and bottom cards are red.

Consider events: A : "Top card is red"

B : "Bottom card is red"

$$\text{We seek } P(A \cap B) = P(A) \cdot P(B|A)$$

$$= \frac{26}{52} \cdot \frac{25}{51} = \frac{25}{102} \approx \boxed{24.51\%}$$