Name: Richard

QUIZ 16 ♡

MATH 211
March 28, 2023

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.

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

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

Therefore $P(A) = P(A|B)$, so A & B are <u>independent</u>

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."

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

$\approx$ 12.75%

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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.

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

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

Therefore $P(A) \neq P(A|B)$ so A & B are <u>dependent</u>

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"

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

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