CSCI 104 HW 5 Probability Problems

---

1. Assuming the professor asks 1 question:

$$P = 1 - \frac{1}{15} = 0.933$$

probability that no student will have to answer more than 1 question:

$$P = 1 - \frac{8}{15} = \frac{7}{15} = 0.467$$

2. $N = 5 \times 4 \times 8 \times 7 \times 1$

odd

odd unique

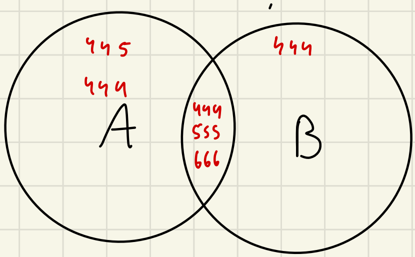
any unique

$$5 \times 4 \times 8 \times 7 \times 1 = 1120$$

total combination probability $= \dfrac{1120}{10000} \approx 0.112$

$$0.112 \times \frac{5}{8} = 0.07$$

3. $A \in \begin{bmatrix} 444 \\ 555 \\ 666 \\ 445 \\ 456 \end{bmatrix}$ $\vdots$ $\qquad B \in \begin{bmatrix} 444 \\ 555 \\ 666 \\ 111 \\ 222 \end{bmatrix}$ $\vdots$



→ they are dependent

4. total flushes probability in a suit:

$_{13}C_5 = 1287$

↓ 4 suits

total flushes $= 1287 \cdot 4 = 5148$

So $\dfrac{5148}{_{52}C_5} = \dfrac{5148}{258640} = \boxed{0.00198}$

↑ probability

5 cards from deck →

5. $P(S) = 0.7$ $\rightarrow$ Probability of Win w/ Superstar
$P(WS) = 0.5$ $\rightarrow$ P of Win w/o Superstar
$P(S)$ play $= 0.75$ $\rightarrow$ P of Superstar playing
$P(Won) = 0.8$ $(4/5)$

$$P(\text{Team}) = P(S)\left((1 - P(WS)\right) + \left(P(WS)(1 - P(S)\right))$$
$$= (0.7)(0.5) + (0.5)(0.3)$$
$$= 0.5$$

$$P(\text{Play}) = P(\text{Won}) \cdot [P(S)(1 - P(\text{Team})) + P(WS)P(\text{Team})]$$
$$= 0.8 \cdot [0.7 \cdot 0.5 + 0.5 \cdot 0.5]$$
$$= 0.48$$ she played those 5 games

48%