Probability

A prof has 15 students, uniformly choose a student to answer a question. Prof asks 8 questions, what is the probability no student will answer than one question

① $\frac{15}{15} \times \frac{14}{15} \times \frac{13}{15} \times \frac{12}{15} \times \frac{11}{15} \times \frac{1}{15} \times \frac{9}{15} \times \frac{8}{15} = \boxed{0.10}$

1 2 3 4 5 6 7 8

② $\frac{1}{5} \cdot \frac{1}{4} \cdot \frac{7}{10} \cdot \frac{6}{10} \cdot \frac{1}{5} = \frac{42}{10,000} = 0.1$

Even $\frac{5 \times 5 \times 4 \times 6}{10 \times 10 \times 10 \times 10} = \frac{4200}{10000}$

③ $P(A) = \frac{3}{6} \times \frac{3}{6} = \frac{1}{2}$ $P(B) = \frac{1}{6} \times \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$

$P(A \cap B) = \boxed{\frac{1}{72}}$

A and B are independent

$P(A) \cdot P(B) = \frac{1}{2} \frac{1}{36} = \frac{1}{72}$

④ $\frac{13}{52}$ $\binom{13}{5}$ $\frac{\binom{13}{5} \cdot 4}{\binom{52}{5}}$ $\sum_{x=1}^{\infty} \times \left(1 - \frac{\binom{13}{5} \cdot 4}{\binom{52}{5}}\right)$

complement $= \frac{1}{\frac{\binom{13}{5} \cdot 4}{\binom{52}{5}}}$

⑤ $P(F)$ = player $P(E)$ Team

$P(F|E) = \frac{P(E \cap F)}{P(E)} = \frac{P(E|F) \cdot P(F)}{P(E)}$

$= \frac{\left(\binom{5}{4} \times 0.7^4 \times 0.3\right) \times .75}{\binom{5}{4} \times 0.7^4 \times 0.3 + \binom{5}{4} \times 0.5^4 \times 0.5} = 0.8737$