1. $\frac{\binom{15}{7}}{15^8} = 0.1012 \approx 10.12\%$

2. $5 \cdot 9 \cdot 7 \cdot 6 \cdot 5 = \left(\frac{3 \cdot 9 \cdot 7 \cdot 6 \cdot 5}{100000}\right)^5 \cdot \left(\frac{1 \cdot 5 \cdot 5 \cdot 4 \cdot 6 \cdot 7}{100000}\right)^3 \cdot \left(\frac{5}{5}\right)$

$= 6.54 \cdot 10^{-6}$

3. $\left(\frac{1}{2}\right)^3 \left(\frac{1}{2}\right)^3 \left(\frac{1}{2}\right)^3$ $P(A) = 1/2$

$P(B) = 1 - \left(\frac{1}{6}\right)^2 = \frac{1}{36}$ $P(A)P(B) = P(A \cap B)$ if is ind.

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

$P(A \cap B) = \frac{3}{6} \cdot \left(\frac{1}{6}\right)^2 = \frac{1}{72}$

4. $1 \cdot \frac{12}{51} \cdot \frac{11}{31} \cdot \frac{10}{49} \cdot \frac{9}{28} = \frac{11880}{3118752}$

$\downarrow$

$\frac{1}{0.00198} = 505.05$

5. $P(\text{Superstar plays}) = 0.75$

$P(\text{win } 4/5 \mid \text{Superstar}) = \binom{5}{4} \cdot 0.4 \cdot 0.3 = 0.36$

$P(\text{win } 4/5) = 0.15625 \cdot 0.25 + 0.36015 \cdot 0.75 = 0.309$

$P(\text{Superstar plays} \mid \text{win } 4/5) = \frac{P(E|F) \cdot P(F)}{P(E)} = \frac{0.36015 \cdot 0.75}{0.309} = 0.8787$

$P(E|F)$