1. $\frac{15!}{7!} / 15^8 = 0.1012 = 10.12\%$

2. random #s $-(100000)^8$

$(5 \cdot 4 \cdot 7 \cdot 6 \cdot 5)$ - actual # $= \left(\frac{(5 \times 5 \times 4 \times 6 \times 7)}{100000}\right)^5 \times$

$\left(1 - \frac{5 \times 5 \times 4 \times 6 \times 7}{100000}\right)^3 \left(\frac{8}{3}\right)$

$= 6.4 \times 10^{-6}$

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

$P(B) = 1 \left(\frac{1}{6}\right)^2 = 1/36$

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

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

$P(A)\,P(B) = P(A \cap B)$; it is independent

4. $1 \times \frac{12}{51} \times \frac{11}{50} \times \frac{10}{49} \times \frac{9}{48} = \frac{11880}{311875200} = \frac{1}{0.00198} = 505.05$

5. when superstar plays → win 70%

when superstar plays → win 50%

P(superstar plays) $= 0.75$

P (win 4/5 | superstar) $= C(5,4) * 0.7^4 * 0.3 = 0.36015$

P (win 4/5 | superstar does not play) $= C(5,4) \times 0.5^5 = 0.15625$

$P(\text{win } 4/5) = 0.15625 \times 0.25 + 0.36015 \times 0.75 = 0.309175$

$P(\text{superstar plays} \mid \text{win } 4/5) = 0.36015 \times 0.75 / 0.309175 = 0.8737$

$$p(F \mid E) = \frac{p(E \mid F) \cdot p(F)}{p(E)}$$