1) $1 \quad \frac{14}{15} \quad \frac{13}{15} \quad \frac{12}{15} \quad \frac{11}{15} \quad \frac{10}{15} \quad \frac{9}{15} \quad \frac{8}{15}$

$$\frac{14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8}{15^7}$$

$$\sim .10124$$

2) 0 – 100

not possible

100 – 1000

$5 \cdot 4 \cdot 5 = 100$

1000 – 10000

$5 \cdot 4 \cdot 7 \cdot 5 = 700$

10 000 – add ad

$5 \cdot 4 \cdot 7 \cdot 6 \cdot 5 = 4200$

$$100 + 700 + 4300 = 5000$$

Total # / required images → 10^5

$$\frac{5000}{10^5} = .05$$

8 #'s, exactly 5 @ p = .05

$$(.05)^5 (1 - .05)^3 \cdot {}_8C_5$$

$$= 1.5004 \times 10^{-5}$$

3) $P(A) = P(X=2) + P(X=3) = {}_3C_2 \cdot \left(\frac{3}{6}\right)^2 \cdot \frac{3}{6} + {}_3C_3 \cdot \left(\frac{3}{6}\right)^3 \left(\frac{3}{6}\right)$

$= \frac{1}{2}$

$P(B) = \frac{6}{6^3} = \frac{1}{36}$

$P(A \cap B) = \frac{1}{6^3} + \frac{1}{6^3} + \frac{1}{6^3} = \frac{1}{72}$

$\frac{1}{2} \cdot \frac{1}{36} = \frac{1}{72}$,

$P(B) \cdot P(A) = P(A \cap B)$

A and B are independent

1) $p = \frac{4 \cdot {}_{13}C_5}{{}_{52}C_5}$

$E[X] = \frac{1}{p} = \frac{{}_{52}C_5}{4 \cdot {}_{13}C_5} = 504.8$

2) win 4/5 & plays $= {}_5C_4 \cdot .7^4 \cdot .3 = .36015$

win 4/5 & no play $= {}_5C_4 \cdot .5^5 = .15625$

$P(\text{win } 4/5) = .15625(.25) + .36015(.75) = .309125$

$P(\text{superstar plays} \mid \text{win } 4/5) = .36015 \cdot .75 / .309125$

$= .8737$