Recitation 19

1. Bayes' Rule

a. $\dfrac{Pr(A \cap B)}{Pr\{B\}} Pr\{B\} = \dfrac{Pr(A \cap B)}{Pr\{A\}} \cdot Pr\{A\}$

b. $\dfrac{Pr\{R \wedge U\}}{Pr\{U\}} = \dfrac{.8 \times .3}{.4} = .6$

2. DNA Profiles

a. $1 - e^{-m^2/2N} = 1 - e^{-300 m^2/2 \cdot 206} \approx 1$

b. 2 arbitrary people matching is a certainty.
Not a particular person matching.

3. The Immortals

a. McLeod is right. If p tends to tails.

b. $np(1-p)^{n-1}$

c. $\max\limits_{p} \{np(1-p)^{n-1}\} \Rightarrow p = \dfrac{1}{n}$

d. $n \cdot \dfrac{1}{n} \left(\dfrac{n-1}{n}\right)^{n-1} = \left(\dfrac{n-1}{n}\right)^{n-1} = \left(1 - \dfrac{1}{n}\right)^{n-1} \longrightarrow 1/e$