1. (a) $\frac{1}{5}$
   (b) $(\frac{3}{5})(\frac{1}{3}) = \frac{4}{15}$
   (c) $(\frac{2}{5})(\frac{1}{3}) + (\frac{3}{5})(\frac{2}{3}) = \frac{8}{15}$
   (d) $\frac{2}{5}$
   (e) $1 - \frac{3}{10} = \frac{7}{10}$

2. Our goal is to determine $P(M|R)$, which we may find by means of Bayes' Rule:

   \[
   P(M|R) = \frac{P(M \cap R)}{P(R)}
   \]
   \[
   = \frac{P(M)P(R|M)}{P(M)P(R|M) + P(M^c)P(R|M^c)}
   \]
   \[
   = \frac{(0.01)(0.88)}{(0.01)(0.88) + (0.99)(0.07)}
   \]
   \[
   \approx 0.1127
   \]

3. $A_{12}$ and $A_{13}$ are independent, and the same is true of any other pair from the events $A_{12}$, $A_{13}$, and $A_{23}$. However, $A_{12}$, $A_{13}$, and $A_{23}$ are not independent. In particular, if $A_{12}$ and $A_{13}$ occur, then $A_{23}$ also occurs.