M118
FALL 2000

QUIZ 5

NAME _____

1) (10 PTS.) Let A, B be events with $Pr[A] = .2$, $Pr[B] = .6$, and $Pr[A \cap B] = .1$. Find $Pr[A|B]$.

$$Pr(A|B) = \frac{Pr(A \cap B)}{Pr(B)} = \frac{.1}{.6} = 1/6$$

Other Version:

$Pr(A) = .2$
$Pr(B) = .7$
$Pr(A \cap B) = .1$

$\frac{.1}{.7} = \frac{1}{7}$

Answer: _____

2) (10 PTS.) Let A, B be events with $Pr[A] = .2$, $Pr[B] = .6$, and $Pr[A \cap B] = .1$. Find $Pr[B|A]$.

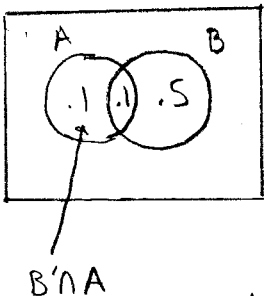
$$Pr(B|A) = \frac{Pr(A \cap B)}{Pr(A)} = \frac{.1}{.2} = 1/2$$

Other Version

$\frac{.1}{.2} = \frac{1}{2}$

Answer: $1/2$

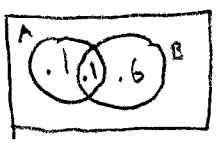
4) (10 PTS.) Let A, B be events with $Pr[A] = .2$, $Pr[B] = .6$, and $Pr[A \cap B] = .1$. Find $Pr[B'|A]$.



$B' \cap A$

$$Pr(B'|A) = \frac{Pr(B' \cap A)}{Pr(A)} = \frac{.1}{.2} = 1/2$$

Other Version



$\frac{Pr(B' \cap A)}{Pr(A)} = \frac{.1}{.2} = \frac{1}{2}$

Answer: $1/2$

SEE OTHER SIDE

4) (10 PTS.) There are 7 men and 3 women in a room. Two of these 10 people are selected at random. If both people selected are of the same sex, then what is the probability that both are women?

$$Pr(2W|SS) = \frac{Pr(2W \cap SS)}{Pr(SS)} = \frac{Pr(2W)}{Pr(SS)} = \frac{\binom{3}{2}/\binom{10}{2}}{\binom{3}{2}/\binom{10}{2} + \binom{7}{2}/\binom{10}{2}}$$

$$= \frac{\binom{3}{2}}{\binom{3}{2}+\binom{7}{2}} = \frac{3}{3+21} = \frac{1}{8}$$

OTHER VERSION

$$Pr(2M|SS) = \frac{Pr(2M \cap SS)}{Pr(SS)} = \frac{Pr(2M)}{Pr(SS)} = \frac{\binom{7}{2}/\binom{10}{2}}{\binom{7}{2}/\binom{10}{2} + \binom{3}{2}/\binom{10}{2}} = \frac{21}{21+3}$$

$$= 7/8$$

Answer: _____

5) (10 PTS.) There are 7 men and 3 women in a room. Two of these 10 people are selected at random. If it is known that at least one women was selected, then what is the probability that both are women?

$$Pr(2W|AIW) = \frac{Pr(2W \cap AIW)}{Pr(AIW)} = \frac{Pr(2W)}{Pr(AIW)} = \frac{\binom{3}{2}/\binom{10}{2}}{\frac{\binom{7}{1}\binom{3}{1}+\binom{3}{2}}{\binom{10}{2}}}$$

$$= \frac{3}{21+3} = \frac{1}{8}$$

OTHER VERSION

$$Pr(2M|AIM) = \frac{Pr(2M \cap AIM)}{Pr(AIM)} = \frac{Pr(2M)}{Pr(AIM)} = \frac{\binom{7}{2}/\binom{10}{2}}{\frac{\binom{7}{1}\binom{3}{1}+\binom{7}{2}}{\binom{10}{2}}}$$

$$= \frac{21}{21+21} = \frac{1}{2}$$

Answer: _____