Math 153 - Quiz 6
March 14, 2013

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (5 points) Suppose A and B are events such that $P(A) = 0.8125$, $P(\overline{B}) = 0.35$, and $P(A|B) = 0.8$.

   (a) Find $P(B)$.

   $1 - 0.35 = \underline{0.65}$

   (b) Find $P(A \cap B)$.

   $P(A \cap B) = P(A|B) \cdot P(B) = (0.8)(0.65) = \underline{0.52}$

   (c) Find $P(B|A)$.

   $P(B|A) = \dfrac{P(A \cap B)}{P(A)} = \dfrac{0.52}{0.8125} = \underline{0.64}$

   (d) Find $P(A \cup B)$.

   $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

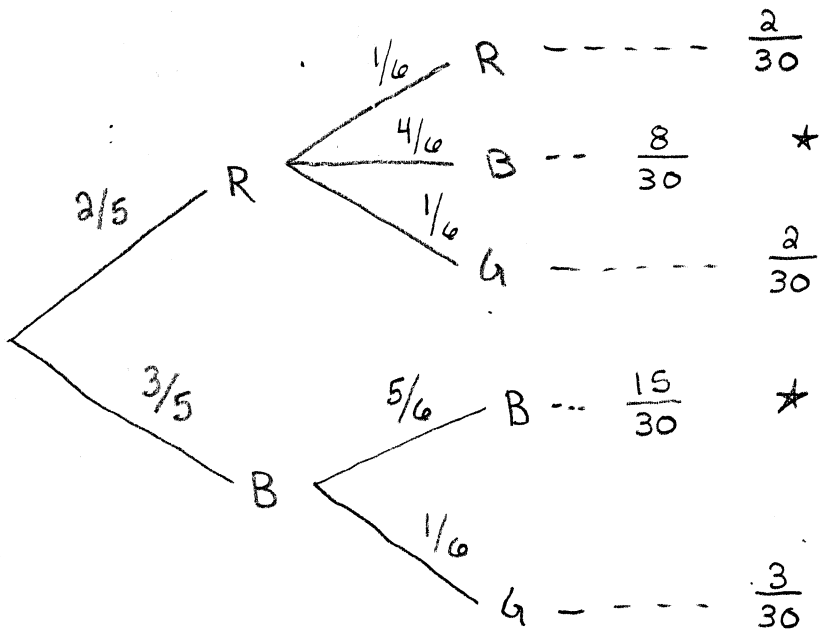
   $= 0.8125 + 0.65 - 0.52 = \underline{0.9425}$

   (e) Are A and B independent? Explain or show work.

   No, $P(B|A) = 0.64 \neq P(B) = 0.65$

2. (5 points) Jar 1 contains 2 red marbles and 3 blue marbles. Jar 2 contains 4 blue marbles and 1 green marble. A marble is selected from Jar 1 and placed into Jar 2. Then a marble is selected from Jar 2.

(a) Sketch the complete tree diagram for this experiment. Include the probabilities of each path.



(b) What are the odds in favor of selecting a blue marble from Jar 2?

$$\text{PROB IS } \frac{8}{30} + \frac{15}{30} = \frac{23}{30}$$

$$\text{ODDS ARE } \frac{23/30}{7/30} = \frac{23}{7}$$