Math 153 - Quiz 5

March 7, 2013

Name key

Score _____

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

1. (2 points) The sample space for a probability experiment is $\{R, W, B, Y\}$. Must it be true that $P(\{Y\}) = 1/4$? Explain. No, IT WOULD ONLY BE TRUE IF EACH OUTCOME WAS EQUALLY LIKELY.

2. (4 points) Suppose A and B are events such that $P(A) = 0.68$, $P(\overline{B}) = 0.45$, and $P(A \cup B) = 0.83$.

   (a) Find $P(B)$. $1 - 0.45 = 0.55$

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

   $0.83 = 0.68 + 0.55 - P(A \cap B) \Rightarrow P(A \cap B) = 0.4$

   (c) Are A and B disjoint (mutually exclusive)? Explain.

   No, $P(A \cap B) = 0.4 \neq 0$

   (d) Find the odds against A.

   $$\frac{1 - 0.68}{0.68} = \frac{0.32}{0.68} = \frac{32}{68} = \frac{8}{17}$$

3. (4 points) The letters A, B, G, H, e, g, k, w, and z are each written on a slip of paper and the slips are placed into a bag. One slip is selected at random.

   (a) Are the slips of paper equally likely? Is each letter equally likely?

   YES. No, THERE ARE TWO g's.

   (b) What is the event of selecting a slip with lower-case letter?

   $\{e, g, k, w, z\}$

   (c) What is the probability of selecting a slip with a vowel?

   $2/9$

   (d) What is the probability of selecting a letter that rhymes with *see* or *hay*?

   $\{A, B, G, e, g, k, z\}$

   PROB IS $7/9$