Math 148 Quiz Five Version A

Name:

1. Answer the following questions:

   (a) What does it mean for two events to be mutually exclusive?

   Two events are mutually exclusive if they cannot happen at the same time. $P(A$ **and** $B) = 0$

   (b) What does it mean for two events to be independent?

   The occurrence of one event has no effect on the possibility of the occurrence of the other. $P(A|B) = P(A)$ **and** $P(B|A) = P(B)$

2. A deck of cards is shuffled and a card is drawn. Let A be the event that the card is a club and B be the event that the card is a king.

   (a) Calculate the following probabilities: P(A), P(B), P(A and B), P(A or B), P(A given B), P(B given A).

   $P(A) = 13/52 = 1/4$ $P(B) = 4/52 = 1/13$ $P(A$ and $B) = 1/52$
   $P(A$ or $B) = 13/52 + 4/52 - 1/52 = 16/52 = 4/13$
   $P(A|B) = 1/13$ $P(B|A) = 1/4$

   (b) Are the events A and B independent? Explain.

   Yes because $P(A|B) = P(A)$ **and** $P(B|A) = P(B)$

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

   No, $P(A$ **and** $B) = 1/52$**.**