Conditional Probability Worksheet 8 - Answers

1. If all outcomes in a sample have an equal probability of occurring, then the probability model for that sample is uniform. Is this statement true or false?

   True. This is the definition of a uniform probability model.

2. If two outcomes in a sample have a different probability of occurring, then the multiplication rule for events A and B, $P(B)P(A|B) = P(A \text{ and } B)$, can be used. Is this statement true or false?

   False. The sample must fit a uniform probability model for the multiplication rule to apply.

3. An event is a group of possible outcomes. Is this statement true of false?

   True. This is the definition of an event. Use the multiplication rules for uniform probabilities to answer questions 4-10.

4. $P(A) = 0.75$ and $P(B|A) = 0.50$. What is $P(A \text{ and} B)$?

   0.38.

5. $P(C) = 0.60$ and $P(B|C) = 0.35$. What is $P(B \text{ and } C)$?

   0.21.

6. $P(A \text{ and } B) = 0.35$ and $P(A|B) = 0.50$. What is $P(B)$?

   0.70.

7. $P(A|B) = 0.40$, $P(A) = 0.60$ and $P(B|A) = 0.20$. What is $P(B)$?

   0.30

8. $P(B) = 0.50$, $P(A) = 0.25$, and $P(B|A) = 0.50$. What is $P(A|B)$?

   0.25.

9. $P(B) = 0.20$, $P(A|B) = 0.30$, and $P(B|A) = 0.10$. What is $P(B)$?

   0.60.

10. P(A) = 1.00, P(B—A) = 0.25, and P(B) = 0.30. What is P(A—B)?

    $P(A|B) \approx 0.83$.
