Homework #2 - Chapter 2 Probability (Montgomery & Runger, 5ed)

Problems:
  Answers to odd-numbered problems can be found in Appendix B.
  Answers to even-numbered problems are provided below.

   2-2 Axioms and Laws of Probability
   Pages 35 - 36, Problems 2-61, 63, 66, 67

   2-3 Addition Rule
   Pages 40, Problems 2-74, 75, 77, 79

   2-4 Conditional Probabilities
   Pages 45 - 46, Problems 2-87, 93, 95, 97

   2-5 Multiplication Rule
   Pages 49, Problems 2-105, 106, 109, 111, 113 Correction 2-111 b) 0.078

   2-6 Independence
   Pages 53 - 54, Problems 2-122, 124, 126, 127, 129

Answers:
   2-66   a) 0.86   b) 0.79   c) 0.14   d) 0.70   e) 0.95   f) 0.84

   2-74   a) 0.7   b) 0.4   c) 0.1   d) 0.2   e) 0.6   f) 0.8

   2-106   0.22

   2-122   No
           If A and B are independent, then $P(A|B) = P(A)$.
           Since $P(A|B) = 0.4$ and $P(A) = 0.5$, A and B are not independent.

   2-124   No
           If A and B are mutually exclusive, then $P(A \text{ AND } B) = 0$.
           If A and B are independent, then $P(A \text{ AND } B) = P(A) \times P(B)$.
           Since $P(A) \times P(B) = 0.2 \times 0.2 = 0.04 \neq 0$, A and B are not independent.

   2-126   No
           If A and B are independent, then $P(A \text{ AND } B) = P(A) \times P(B)$.
           $P(A \text{ AND } B) = 70/100 = 0.70$.
           Since $P(A) \times P(B) = 86/100 \times 79/100 = 0.68$, A and B are not independent.