Section 4.3 Problems

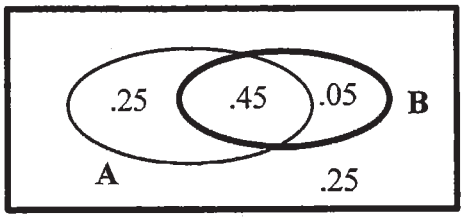
1. a) $P(A) = 7/19$
   b) $P(\overline{A}) = 12/19$
   c) $P(A \text{ and } B) = 3/19$
   d) $P(A \text{ and } \overline{B}) = 4/19$
   e) $P(B \text{ and } \overline{A}) = 5/19$
   f) $P(\overline{A} \text{ and } \overline{B}) = 7/19$
   g) $P(A \text{ or } B) = 12/19$
   h) $P(A \text{ or } B) = 12/19$
   i) $P(\overline{A \text{ and } B}) = 1 - P(A \text{ and } B) = 1 - 3/19 = 16/19$

2. a) $P(\text{Red}) = 26/52 = 1/2$
   b) $P(\text{Red and King}) = 2/52 = 1/26$
   c) $P(\text{Red or King}) = 28/52 = 7/13$
   d) $P(\text{Jack or King}) = 8/52 = 2/13$
   e) $P(\text{Ace or Diamond}) = 16/52 = 4/13$

3. a) $P(K \text{ and } S) = 9/30 = 3/10$
   b) $P(\overline{A}) = 23/30$
   c) $P(\text{Ph and } \overline{H}) = 9/30 = 3/10$
   d) $P(H \text{ or Ph}) = 19/30$
   e) $P(K \text{ or } A) = 20/30 = 2/3$

4. Let A = {she gets first contract}, then $P(A) = 0.70$
   Let B = {she gets second contract}, then $P(B) = 0.50$

   $P(\overline{A} \text{ and } \overline{B}) = 0.25$
   Therefore $P(A \text{ or } B) = 1 - 0.25 = 0.75$



   a) Since $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, solving for $P(A \text{ and } B)$ gives
   $$P(A \text{ and } B) = P(A) + P(B) - P(A \text{ or } B)$$
   $$= .70 + .50 - .75$$
   $$= 0.45$$

   b) $P(A \text{ or } B) = 0.75$

   c) $P(A \text{ and } \overline{B}) = 0.25$

   d) $P([A \text{ and } \overline{B}] \text{ or } [\overline{A} \text{ and } B]) = .25 + .05 = 0.30$