Lab for Section 2.3

Use good notation and show appropriate work. Write the solutions to word problems in complete sentences.

1. For $U = \{1, 2, 3, \ldots, 10\}$, $A = \{1, 3, 5, 7, 9\}$, $B = \{1, 2, 3, 4, 5, 6\}$, and $C = \{2, 4, 6, 7, 8\}$ perform the indicated operations:

   (a) $B \cap C$

   (b) $A \cap \emptyset$

   (c) $A \cup U$

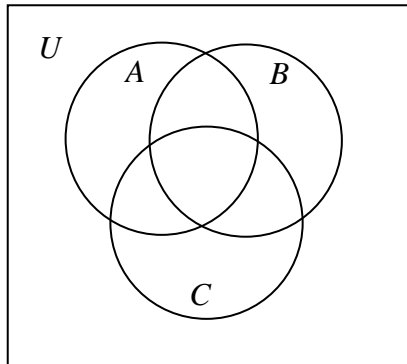   (d) $A' \cap (B \cup C')$

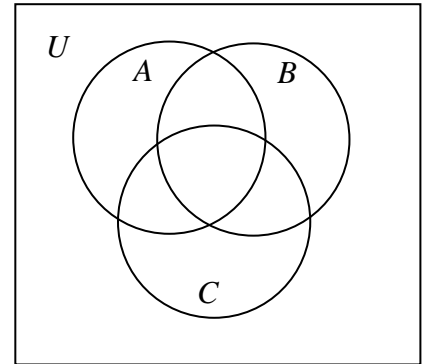   (e) $A - (B \cup C)$

   (f) $A' \cap B'$

   (g) $(A - C) \cup (B - C)$

2. Shade the region associated with the given set. If you do all shadings on a single diagram, be sure you make it clear which shading is your final answer. If you draw intermediate diagrams and build the final result, show all drawings leading to the final drawing.
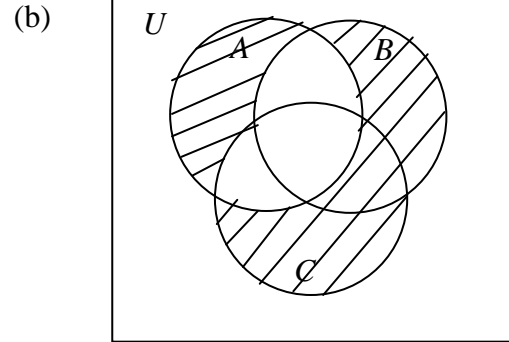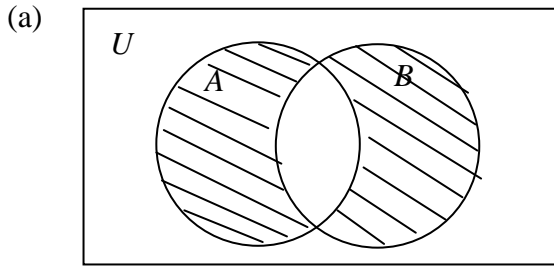
   (a) $(A \cap B) - C$

   (b) $A' \cup (B \cap C)'$

3. In each, name the shaded region using the letters A, B, C, and the set operations.

(a)

(b)

4. Assume A, B, and C are subsets of a universal set U and $n(U) = 50$, $n(A \cap B \cap C) = 8$, $n(A \cap B) = 10$, $n(A \cap C) = 8$, $n(B \cap C) = 12$, $n(A) = 15$, $n(B) = 25$, and $n(C) = 27$. Determine each of the following cardinal numbers.

(a) $n(A \cup B)$

(b) $n(C')$

(c) $n(A' \cap B)$

(d) $n((A \cup C) - (B \cup C))$

(e) $n((A \cup B) \cap (A \cap C)')$

(f) $n((A \cap C) - B)$