I. Several Venn diagrams are given below. In each diagram shade the indicated region.

1. Shade \( (A \cap B)' \)
2. Shade \( (A \cup B)' \)
3. Shade \( A' \cap B \)
4. Shade \( A \cup B' \)
5. Shade \( (A \cap B) \cup C \)
6. Shade \( (A \cup B') \cap C \)
7. Shade \( A' \cap (B \cup C) \)
8. Shade \( A' \cup (B \cap C) \)
9. Shade \( (A \cap B) \cup (A \cap C) \)
II. Use the Venn diagram below to identify the elements of the indicated sets.

III. Given the following sets, construct a Venn Diagram incorporating sets A, B and C.

IV. The areas of a Venn diagram are often represented as “regions” using roman numerals. For each problem below, identify region in which it would be placed.

1. A ∩ (B U C) =
2. (A' ∩ B) U C
3. A' ∩ (B U C)
4. A ∩ (B U C)'

U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}     A = \{3, 6, 9\}  B = \{3, 5, 7, 9\}     C = \{1, 2, 3, 4, 5\}

1. 6     2. 20
3. 30     4. 9
5. 15     6. 42210
V.

Identify each region using appropriate Roman Numerals:

1. \((A \cap B) \cup C\)
2. \(A \cap (B \cup C)\)
3. \((A \cup C)\)'
4. \(A' \cup C'\)
5. \((A \cup C)'\)
6. \(A' \cap C'\)

7 – 8. Using your results, answer the following as true or false.

7. \((A \cup C)' = A' \cup C'\)
8. \((A \cup C)' = A' \cap C'\)

9. Look at your results from 7 and 8 above. If you distribute the “complement” do you get equal sets? ________ Under what conditions? __________________________________________

VI. Given the following Venn Diagram, determine if the statements are true or false, assuming that there are no empty regions in the diagram and the letters represent the names of the sets.

1. \(B \subset A\)
2. \(A \cap B = B\)
3. \(A' \cap C = \emptyset\)
4. \(A \cup C = U\)

VII. (CLAST) Using the diagram from VII, determine if the following statements are true or false, assuming that there are no empty regions and the letters represent the names of the sets.

1. No element of set C is also an element of set A.
2. Every element of set A is also an element of set B.
3. Some element of set A are also elements of set B.
4. All elements of set B are also elements of set A.
5. Some elements of set B are also elements of set C.
6. No element is a member of all three sets.

HW: Section 2.4 Problems 7, 8, 27-38 all, 45-57 odd, do 67 and 71 using the diagram from 80.