Sets

Please do the assignment on lined loose leaf paper. Put your name on each page and staple all sheets.

1. Which of the following sets are equal to the set \{4, 5, 6\}?
   (a) \{5, 6, 4\}
   (b) the set of integers greater than 3
   (c) the set of integers less than 7
   (d) the set of integers greater than 3 or less than 7
   (e) the set of integers greater than 3 and less than 7
   (f) \{5, 4, 5, 6\}

2. Let \(A = \{1, 2, 3, 4, 5\}, B = \{3, 4, 5\}, \text{ and } C = \{4, 5, 6\}\). In the following insert \(\in, \subseteq, \text{or } \not\subseteq\) to make true statement.
   (a) 2 _____ \(A\)
   (b) \(B \subseteq A\)
   (c) \(C \subseteq A\)
   (d) 6 _____ \(A\)
   (e) \(A \subseteq A\)
   (f) \(B \cap C \subseteq A\)

3. Let \(R = \{a, b, c\}, S = \{c, d, e, f\}, \text{ and } T = \{x, y, z\}\). Find each of the following sets.
   (a) \(R \cup S\)
   (b) \(R \cap S\)
   (c) \(R \cup T\)
   (d) \(R \cap T\)
   (e) \(S \cup T\)
   (f) \(S \cap T\)

4. Draw a Venn diagram like the following for each part. Then shade each Venn diagram to represent the set indicated.

   ![Venn Diagram]

   (a) \(S\)
   (b) \(T\)
   (c) \(S \cup T\)
   (d) \(S \cap T\)
   (e) \((S \cup T)^c\)
   (f) \(T^c\)
   (g) \((S \cap T)^c\)
   (h) \(S^c \cup T\)
   (i) \(S^c \cap T\)
   (j) \(S \cap T^c\)
   (k) \(S^c \cap T^c\)
   (l) \(S^c \cap T^c\)

5. Let \(A = \{1, 3, 5, 7, 9\}, B = \{1, 3, 9\}, \text{ and } C = \{2, 3, 4, 5, 6\}\). In the following insert \(\in, \subseteq, \text{or } \not\subseteq\) to make true statement.
   (a) 7 _____ \(A\)
   (b) \(A \subseteq B\)
   (c) \(C \subseteq A\)
   (d) 6 _____ \(C\)
   (e) \(C \subseteq C\)
   (f) \(B \cap C \subseteq A\)

6. Let \(R = \{\text{red, blue, green}\}, S = \{\text{red, orange, yellow}\}, \text{ and } T = \{\text{red, violet, blue}\}\). Find each of the following sets.
   (a) \(R \cup S\)
   (b) \(R \cap S\)
   (c) \(R \cup T\)
   (d) \(R \cap T\)
   (e) \(S \cup T\)
   (f) \(S \cap T\)