1. Suppose $A = \{0, 2, 4, 6, 8\}$ and $B = \{4, 5, 6, 7, 8\}$ have universal set $U=\{0, 1, 2, 3, 4, 5, 6, 7, 8\}$. Find:

(a) $A - B = \{0, 2\}$

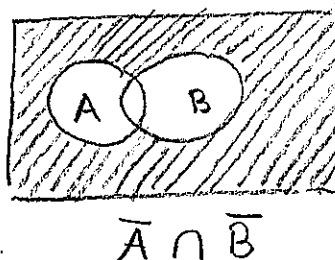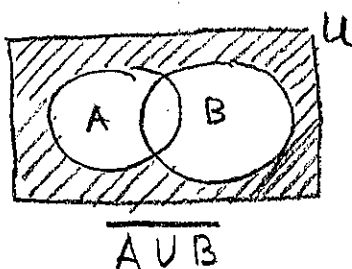(b) $A \cap B = \{4, 6, 8\}$

(c) $\overline{B} = \{0, 1, 2, 3\}$

(d) $B \cap \overline{B} = \phi$

(e) $A \cup B = \{0, 2, 4, 5, 6, 7, 8\}$

(f) $\overline{A \cup B} = \{1, 3\}$

2. Suppose sets A and B are in a universal set U. Draw Venn diagrams for $\overline{A \cup B}$ and $\overline{A} \cap \overline{B}$. Based on your drawings, do you think it's true that $\overline{A \cup B} = \overline{A} \cap \overline{B}$?

$\overline{A \cup B}$ $\overline{A} \cap \overline{B}$

Diagrams are the same so $\overline{A \cup B} = \overline{A} \cap \overline{B}$

3. Suppose $A_1 = \{a, b, c, d, e\}$, $A_2 = \{d, e, f\}$ and $A_3 = \{e, f, g, h\}$.

(a) $\bigcup_{i=1}^{3} A_i = \{a, b, c, d, e, f, g, h\}$

(b) $\bigcap_{i=1}^{3} A_i = \{e\}$

1. Suppose $A = \{0, 2, 4, 6, 8\}$ and $B = \{4, 5, 6, 7, 8\}$ have universal set $U = \{0, 1, 2, 3, 4, 5, 6, 7, 8\}$. Find:

(a) $\overline{A} = \{1, 3, 5, 7\}$

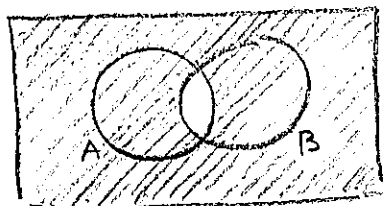(b) $B - A = \{5, 7\}$
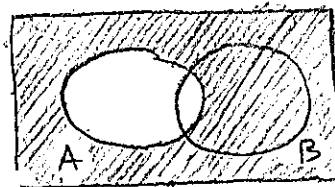
(c) $B - \overline{A} = \{4, 6, 8\}$

(d) $A \cup \overline{A} = U$

(e) $A \cap \overline{A} = \phi$

(f) $\overline{A \cap \overline{A}} = \overline{\phi} = \boxed{U}$

2. Suppose sets A and B are in a universal set U. Draw Venn diagrams for $\overline{A \cap B}$ and $\overline{A} \cup \overline{B}$.
Based on your drawings, do you think it's true that $\overline{A \cap B} = \overline{A} \cup \overline{B}$?

$$\overline{A \cap B}$$

$$\overline{A} \cup \overline{B}$$

The diagrams are the same, so $\overline{A \cap B} = \overline{A} \cup \overline{B}$

3. Suppose $A_1 = \{a, b, c, d, e\}$, $A_2 = \{d, e, f\}$ and $A_3 = \{f, g, h\}$.

(a) $\bigcup_{i=1}^{3} A_i = \{a, b, c, d, e, f, g, h\}$

(b) $\bigcap_{i=1}^{3} A_i = \phi$