

MATH 140 - Lecture 2 Worksheet

1. (a) (1.5) Suppose $A = \{a, b, c, d, e\}$, $B = \{d, e, f\}$, $C = \{1, 2, 3\}$, compute the following:

i. $A \cup B$

iv. $A \cap C$

ii. $A \cap B$

v. $(A \cap C) \cup (A - C)$

iii. $(A - B) \cup (B - A)$

vi. $(A \cap B) \times B$

(b) Compute the union/intersections/difference of the following intervals. Sketch them on the real line.

i. $[2, 5] \cup [3, 6]$

iii. $[2, 5] - [3, 6]$

ii. $[2, 5] \cap [3, 6]$

iv. $(-\infty, 2) \cup [1, \infty)$

(c) Express the solution set of the compound inequality “ $3x - 5 \geq 1$ AND $2x + 3 < 11$ ” as an interval.

2. Let $A = \{4, 3, 6, 7, 1, 9\}$ and $B = \{5, 6, 8, 4\}$ have universal set $U = \{0, 1, 2, \dots, 10\}$. Find:

(a) \bar{A}

(e) $A - \bar{A}$

(b) \bar{B}

(f) $\bar{A} - \bar{B}$

(c) $A \cap \bar{A}$

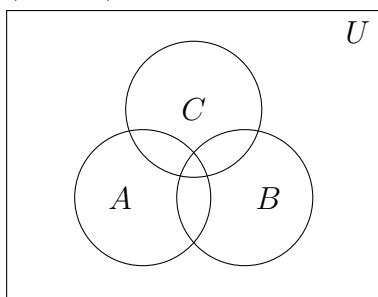
(g) $\overline{A \cup B}$

(d) $A \cup \bar{A}$

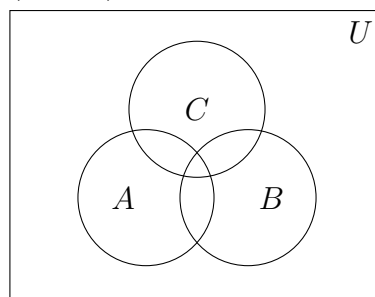
(h) $\overline{\bar{A} \cap B}$

3. Shade in the Venn diagrams for the following:

(a) $(A - B) \cap C$



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



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4. Suppose $A_1 = \{a, b, d, e, g, f\}$, $A_2 = \{a, b, c, d\}$, $A_3 = \{b, d, a\}$ and $A_4 = \{a, b, h\}$. Find the following:

(a) $\bigcup_{i=1}^4 A_i$

(b) $\bigcap_{i=1}^4 A_i$

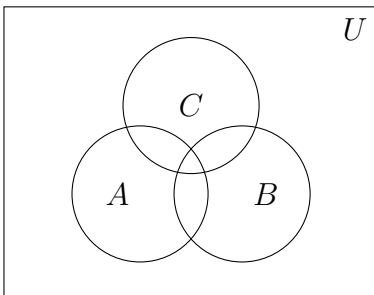
Additional Problems

1. Suppose $A = \{0, 1\}$ and $B = \{1, 2\}$, Find:

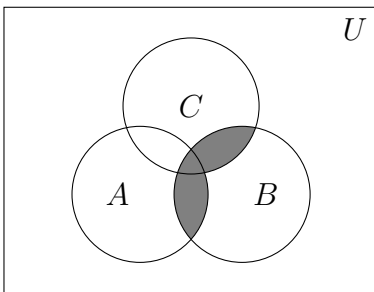
(a) $(A \times B) \cap (B \times B)$

(b) $(A \times B) \cup (B \times B)$

2. Shade in the Venn diagram for $(A \cap B) - C$.



3. Write the expression for the Venn diagram below:



4. Express the sum in Sigma notation:

$$1 + 4 + 7 + 10 + \cdots + 25$$