SET OPERATIONS
AND COMPOUND
INEQUALITIES

Objective: To find the intersection of two sets and to solve compound inequalities.

VOCABULARY

- **element** – a member of a set
- **inequality** – two inequalities joined by the word *and* or the word *or*; solve each part separately
- **intersection** – elements in **all** sets; uses the word *and*; symbol is \( \cap \)
- **union** – **of** elements; uses the word *or*; symbol is \( \cup \)

EXAMPLES

LIST THE ELEMENTS IN EACH SET.

Let \( A = \{-2, -4, -6, -8\} \) and \( B = \{-5, -6, -7\} \).

a) Find \( A \cap B \). b) \( B \cup A \).

c) \( x < -2 \) and \( x > -4 \)

d) \( x + 6 \leq 12 \) and \( x - 4 \geq -10 \)

e) \( 7x + 6 \leq 48 \) and \( -4x \geq -24 \)
EXAMPLES: LIST THE ELEMENTS IN EACH SET.
Let $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{1, 3, 5\}$ and $C = \{1, 6\}$.
f) Find $B \cap C$. g) Find $C \cup B$.

h) Find $A \cap \emptyset$.

EXAMPLES
COMPOUND WITH OR
i) $x \leq -2$ or $x \leq 6$.

j) $x + 1 > 3$ or $x + 4 < 2$.

EXAMPLE
COMPOUND WITH OR
k) $3x < x + 12$ or $3x - 8 > 10$

EXAMPLES
COMPOUND WITH OR
Express each set in interval form.
l) $(\infty, 9) \cap (-1, \infty)$
m) $(5, 11) \cap [6, \infty)$