جامعة بيرزيت
BIRZEIT UNIVERSITY

Computer Science Department

Worksheet - COMP233

1- Let $C = \{n \in \mathbf{Z} \mid n = 6r - 5 \text{ for some integer } r\}$ and
$D = \{m \in \mathbf{Z} \mid m = 3s + 1 \text{ for some integer } s\}$.
Prove or disprove C=D.

2- Let $A = \{1, 3, 5, 7, 9\}$, $B = \{3, 6, 9\}$, and $C = \{2, 4, 6, 8\}$.
Find each of the following:

a. $A \cup B$	**b.** $A \cap B$	**c.** $A \cup C$	**d.** $A \cap C$
e. $A - B$	f. $B - A$	g. $B \cup C$	h. $B \cap C$

3- Let $C_i = \{i, -i\}$ for all nonnegative integers i.
Find

a. $\bigcup_{i=0}^{4} C_i$
b. $\bigcap_{i=0}^{4} C_i$
c. Are C_0, C_1, C_2, . . . mutually disjoint?
d. $\bigcup_{i=0}^{\infty} C_i$
e. $\bigcap_{i=0}^{\infty} C_i$

4- Use an element argument to prove the following statement

For all sets A and B, $(A \cap B) \cup (A \cap B^c) = A$

5- Prove for all sets A and B, $(A \cap B) \cap (A \cap B^c) = \emptyset$.

6- Prove or disprove for all sets A, B, and C, $(A \cap B) \cup C = A \cap (B \cup C)$.

7- Construct an algebraic proof for the given statement. Cite a property from Theorem 6.2.2 for every step. For all sets A, B, and C,

$(A \cap B) \cup C = (A \cup C) \cap (B \cup C)$.