

Homework # 14 (due Monday, March 30)

1. Prove that for all x, y, z, w

a) $|x-y| \leq |x-z| + |z-y|;$

b) $|x-y| \leq |x-z| + |z-w| + |w-y|.$

2. Let $A = \{x \mid x \in \mathbb{Q} \text{ and } x^2 < 10\},$

$$B = \{x \mid x \in \mathbb{Z} \text{ and } x^2 < 10\},$$

$$C = \{x \mid x = 2k, k \in \mathbb{N}\}.$$

Find

a) $A \cap B;$

b) $A \cap C;$

c) ~~$A \cap C;$~~ $B \cap C;$

d) $A \cap B \cap C;$

e) $A \cup B$

f) $A \cup B \cup C.$