

## Homework 8 Question 4

Let  $S = \mathbb{R}$ ,  $A = \{x: x \in S \text{ and } 0 < x < 4\}$ ,  $B = \{x: x \in S \text{ and } 1 < x \leq 3\}$ , and  $C = \{x: x \in S \text{ and } 2 < x \leq 5\}$ . What are the sets:

### **1**   $A \cup B \cup C$

$$\begin{aligned} A \cup B \cup C &= \{x: x \in S \text{ and } 0 < x < 4\} \cup \{x: x \in S \text{ and } 1 < x \leq 3\} \cup \{x: x \in S \text{ and } 2 < x \leq 5\} \\ &= \{x: x \in S \text{ and } 0 < x \leq 5\} \end{aligned}$$

### **2**   $A \cap B \cap C$

$$\begin{aligned} A \cap B \cap C &= \{x: x \in S \text{ and } 0 < x < 4\} \cap \{x: x \in S \text{ and } 1 < x \leq 3\} \cap \{x: x \in S \text{ and } 2 < x \leq 5\} \\ &= \{x: x \in S \text{ and } 2 < x \leq 3\} \end{aligned}$$