

**Problem 1.** Find the decimal expansion of the following rational numbers.

(a)  $\frac{43}{8}$

(b)  $\frac{43}{6}$

(c)  $\frac{43}{7}$

**Problem 2.** Find  $a, b \in \mathbb{Z}$  with  $b > 0$  and  $\gcd(a, b) = 1$  such that  $x = \frac{a}{b}$ .

(a)  $x = 0.\overline{7}$

(b)  $x = 1.2\overline{34}$

(c)  $x = 43.\overline{909}$

**Problem 3.** Consider the following sets.

Let  $A = \{x \in \mathbb{N} \mid x \leq 10\}$ .

Let  $B = \{x \in \mathbb{N} \mid x = 2n + 1 \text{ for some } n \in A\}$ .

Let  $C = \{x \in A \mid x = 2n + 1 \text{ for some } n \in A\}$ .

(a) Write  $A$  using correct roster notation.

(b) Write  $B$  using correct roster notation.

(c) Write  $C$  using correct roster notation.

**Problem 4.** Let  $A = [1, 6]$  and  $B = (3, 8)$ . Write the following sets using interval notation.

(a)  $A \cup B$

(b)  $A \cap B$

(c)  $A \setminus B$

(d)  $B \setminus A$

(e)  $A \triangle B$