

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) $x = 0.\bar{7}$

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

(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) $A \Delta B$