

Problem 1. Find the decimal expansion of $\frac{5}{13}$.

Problem 2. Write the rational number $5.4\overline{32}$ in the form $\frac{a}{b}$, where $a, b \in \mathbb{Z}$.

Problem 3. Let $A = \{1, 2, 5, 7, 8\}$ and $B = \{2, 4, 6, 7, 9\}$. Find the following sets.

(a) $A \cup B$

(d) $B \setminus A$

(b) $A \cap B$

(e) $(1, 7) \setminus A$

(c) $A \setminus B$

(f) $(A \cup B) \setminus (A \cap B)$

Problem 4. Compute the following sets.

(a) $[1, 8] \cup (5, 10)$

(d) $\{2, 3, 5, 7, 11, 13, 17\} \setminus [5, 11)$

(b) $[3, 10] \cap (4, 14]$

(e) $[2, 8] \setminus \{2, 3, 5, 7, 11\}$

(c) $(\{2, 5, 8, 13\} \cup \{2, 3, 8, 9\}) \setminus \{2, 4, 6\}$

(f) $(\mathbb{Z} \cap [3, 7]) \triangle \{n \in \mathbb{N} \mid n^2 < 200\}$

Problem 5. Sketch these subsets of \mathbb{R}^2 .

(a) $[0, 1] \times (2, 4]$

(b) $([1, 2] \cup [3, 4]) \times (\{1, 3\} \cup (5, 7))$

(c) $\{(x, y) \in \mathbb{R}^2 \mid 2x + 3y = 6\}$