

**Problem 1.** Write words that say what the following notation means.

(a)  $a \in A$

(b)  $b \notin A$

(c)  $B \subset A$

(d)  $\emptyset$

**Problem 2.** Suppose we divide 13 into 345, to obtain a quotient and a remainder.

(a) What is the dividend?

(b) What is the divisor?

(c) What is the quotient?

(d) What is the remainder?

**Problem 3.** Suppose we divide  $b$  into  $a$ , and get  $d$  as the quotient and  $c$  as the remainder. Which of the following equations is always true? Circle the correct answer.

- $a = bc + d$
- $b = ac + d$
- $a = bd + c$
- $b = ad + c$

**Problem 4.** For each statement, write **T** in the blank if the statement is true, and write **F** in the blank if the statement is false.

(a) \_\_\_\_\_  $\frac{2}{3} \in \mathbb{Z}$

(k) \_\_\_\_\_  $\{1, 3\} \subset \{1, 2, 3\}$

(b) \_\_\_\_\_  $3 \notin \mathbb{N}$

(l) \_\_\_\_\_  $\{1, 3, 1\} \subset \{1, 2, 3\}$

(c) \_\_\_\_\_  $\frac{3}{2} \in \mathbb{Q}$

(m) \_\_\_\_\_  $\{2, 3, 5\} \subset \mathbb{Z}$

(d) \_\_\_\_\_  $-3 \in \mathbb{Q}$

(n) \_\_\_\_\_  $\mathbb{Z} \subset \{1, 2, 3, 4, 5\}$

(e) \_\_\_\_\_  $4 \notin \mathbb{N}$

(o) \_\_\_\_\_  $\{-2, 0, -2\} \subset \mathbb{N}$

(f) \_\_\_\_\_  $0 \in \mathbb{Q}$

(p) \_\_\_\_\_  $\{1/2\} \in \mathbb{Q}$

(g) \_\_\_\_\_  $0.1 \notin \mathbb{Z}$

(q) \_\_\_\_\_  $\mathbb{N} \subset \mathbb{Q}$

(h) \_\_\_\_\_  $\frac{-5}{2} \notin \mathbb{Q}$

(r) \_\_\_\_\_  $\{1\} \in \{1, 2, 3\}$

(i) \_\_\_\_\_  $\sqrt{2} \notin \mathbb{Q}$

(s) \_\_\_\_\_  $\{1.5, 2.5\} \subset \mathbb{Q}$

(j) \_\_\_\_\_  $\sqrt{5} + 2 \in \mathbb{R}$

(t) \_\_\_\_\_  $\{2, 3, 5\} \subset \{1, 3, 5\}$

**Problem 5.** Find the decimal expansion of the fraction  $\frac{37}{11}$ .

**Problem 6.** Write  $3.1\overline{4}$  as a fraction.