

# Problem Set 9

March 30, 2026

**Problem 1.** Let  $p$  and  $q$  be distinct primes. Prove that there are no integer solutions  $(x, y)$  to  $y = \frac{q}{p}x$  with  $0 < x < p$ .

**Problem 2.** Let  $p$  be an odd prime and  $p \neq 5$  and  $A$  be some give number. Suppose that  $p$  divides  $A^2 - 5$ . Show that  $p \equiv 1 \pmod{5}$  or  $p \equiv 4 \pmod{5}$ .