1. [8pts] Show that 45 is a pseudoprime to the base 17. Is 45 a pseudoprime to the base 2? Justify.
2. [8pts] Solve the Diophantine equation \( x^2 + 3xy - x - 10y^2 - 5y = 23 \) in positive integers \( x, y \).
3. [8pts] Find all primitive Pythagorean triples \((x, y, z)\), with \(x < z\) and \(y < z\), such that \(8x + y = 4z\).