

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 $8x + y = 4z$