PUTNAM EXAM SEMINAR
FALL 2012

ASSIGNMENT 6
DUE OCTOBER 8

Exercise 1. Find all pairs of real numbers (x, y) satisfying the system of equations

$$\frac{1}{x} + \frac{1}{2y} = (x^2 + 3y^2)(3x^2 + y^2)$$
$$\frac{1}{x} - \frac{1}{2y} = 2(y^4 - x^4).$$

[Putnam 2001, B2]

Exercise 2. Show that there is a unique pair of real numbers (x, y) that satisfy the equation

$$(4x^2 + 6x + 4)(4y^2 - 12y + 25) = 28.$$