

Financial Mathematics

Lagrange multipliers and
constrained approximation

0040-1. Maximize $2x - 4y$ subject to the constraint $x^4 + 16y^4 = 1$.

0040-2. Minimize $-x + 9y$ subject to the constraint $x^6 + y^6 = 1$.

0040-3. a. For every integer $n \geq 1$,

Let $(x, y) = (a_n, b_n)$ maximize

$y - x$ subject to

the constraint $x^{2n} + y^{2n} = 1$.

Find (a_n, b_n) .

b. Compute $\lim_{n \rightarrow \infty} (a_n, b_n)$.