

Problem 1

Maximize $f(x, y) = \exp(-0.1(x^2 + y^2)) + \exp(\cos(4\pi x) + \cos(2\pi y))$

$-1 \leq x \leq 1; -2 \leq y \leq 1; x+y \leq 1$ Maximum $\doteq 8.3891$ at $(x, y) = (0, 0)$

Problem 2

Maximize $f(x, y) = \cos(\pi y) + \exp(-\pi * (x - 0.5)^2) * \sin^2(3\pi x)$

$-1 \leq x \leq 2; 4 \leq y \leq 7; x+y \leq 7$ Maximum $= 2$ at $(x, y) = (0.5, 6)$

Problem 3

Maximize $f(x, y) = \cos((x - 1.14)^6) - 1000 * (y^2 - x)^4$

$0 \leq x \leq 2; 0 \leq y \leq 3; x+y \leq 4$ Maximum $= 1$ at $(x, y) = (1, 1)$

Problem 4

Maximize $f(x, y) = 3 - \frac{\sin^2(\sqrt{(x^2 + y^2)})}{(1 + 0.1 * (x^2 - y^2))^2}$ $-1 \leq x \leq 2; -1 \leq y \leq 1; x+y \leq 2$

Maximum $= 3$ at $(x, y) = (0, 0)$

Problem 5

Maximize $f(x, y) = -x \sin(4x) - 1.2y \sin(2y)$ $8 \leq x \leq 10; 10 \leq y \leq 13; x+y \leq 22$

Maximum $\doteq 23.1854$ at $(x, y) = (9.039, 11.802)$

Problem 6

Maximize $f(x, y) = \sin^2(5\pi(x^{\frac{3}{4}} - 0.1)) - (y - 1)^6$ $2 \leq x \leq 4; -1 \leq y \leq 2; x+y \geq 3$

Maximum $= 1$ at $(x, y) = (3.575, 1)$