

Mathematics 1350H – Linear algebra I: Matrix algebra
TRENT UNIVERSITY, Summer 2014

Assignment #2
Optimizing

Due in class on Tuesday, 27 May, 2014.

Consider the region in \mathbb{R}^2 consisting of all the points that satisfy *all* of the following inequalities:

$$\begin{array}{lll} -4 \leq y \leq 4 & -9 \leq 2x + y \leq 9 & -9 \leq x + 2y \leq 9 \\ -4 \leq x \leq 4 & -9 \leq 2x - y \leq 9 & -9 \leq x - 2y \leq 9 \end{array}$$

1. Sketch this region. [3]

Hint: It's a not-quite-regular dodecagon ...

2. Determine the maximum value of $f(x, y) = 5x + 10y + \pi^2$ on this region. At which point(s) in the region does it occur? [4]
3. Determine the minimum value of $g(x, y) = 6x - 4y + \sqrt{e}$ on this region. At which point(s) in the region does it occur? [3]