MAT 175 HW #6

DUE APRIL 19 (WEDNESDAY)

Please **staple** *if necessary. Numbering of problems is as in the textbook.*

(12.8.**4**) Let

$$f(x,y) = xy^2 - 6x^2 - 3y^2$$

Find all critical points. Indicate whether each such point gives a local maximum or a local minimum, or whether it is a saddle point.

(12.8.**12**) Find the global maximum value and global minimum value of

$$f(x,y) = x^2 + y^2$$

on the set

$$S = \{(x,y)\colon\ -1 \leqslant x \leqslant 3,\ -1 \leqslant y \leqslant 4\}$$

and indicate the points of S where each of these extreme values occurs.

(12.8.**16**) Find the shortest distance from the origin to the plane

$$x + 2y + 3z = 12.$$

Hint: Similarly as in example we did in class, the calculations will be much simpler if you minimize *the square* of the distance.