

## **In-class exercises, Feb. 17, 2009**

These problems all involve applications of Lagrange multipliers and are taken from Section 3.4 of the text. Due at the end of class.

1. (Problem 5, p. 243) Find the extreme values of  $f(x,y) = 3x + 2y$  subject to  $2x^2 + 3y^2 = 3$ .
2. (Problem 12, p. 244) A rectangular box with no top is to have a surface area of  $16 \text{ m}^2$ . Find the dimensions that maximize its volume.
3. (Problem 21, p. 223) A parcel delivery service requires that the dimensions of a rectangular box be such that the length plus twice the width plus twice the height be no more than 108 inches ( $\ell + 2w + 2h \leq 108$ ). What is the volume of the largest-volume box that the company will deliver?