

Section 15.8 Worksheet:

Assignment: Page 990: 1-3, 5, 9, 13, 17, 18, 21, 25, 29, 41 (due Wednesday, 2/18).

- a. Suppose that you're climbing a mountain, and want to find the highest elevation at which the temperature is 76° .

Assume that temperature decreases with elevation. Use Figure 1, page 985, with $k = 76$, to explain the strategy.

- b. Who was Lagrange?

- c. An alternate formulation of Lagrange multipliers is that we seek extrema of a function

$$F(x, y, \lambda) = f(x, y) - \lambda(g(x, y) - k)$$

Differentiate with respect to x , y , and λ ; what equations do you derive?

- d. Figure 2, p. 987 could be better: the author shouldn't have drawn the parabolic traces on the surface, but rather he should have drawn the contour lines on the surface. Redraw Figure 2 in this way. Do you see the gradients aligning?