Section 14.8 Worksheet:

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

Assume that temperature decreases with elevation. Use Figure 1, page 981, 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. 984 could be better: rather than the parabolic traces on the surface, it would be better to draw the contour lines on the surface. Redraw Figure 2 in this way. Do you see the gradients aligning?