Additional questions for Chapter 2:

1. Let the production function be the CES form: $y = (x_1^p + x_2^p)^{B/p}$. Find the factor demand functions, supply function and profit function. Show that when B < 1, this function exhibits decreasing returns to scale.

2. Consider the short-run profit function for the Cobb-Douglas technology: $y = x_1^{\alpha}\bar{x}_2^{1-\alpha}$. Find the factor demand functions, supply function and profit function.

3. Consider the problem

$$\max_{x,y} x^2 + y^2 + y - 1$$
$$\text{s.t.: } (x,y) \in \mathcal{D} = \{(x,y) \in \mathbb{R}^2 \mid g(x,y) = x^2 + y^2 \leq 1\}.$$

   a. Set up the Lagrangian
   b. Enumerate the Kuhn-Tucker conditions
   c. Solve for the maximum

4. Consider the problem

$$\max_{x,y} x^2 - y$$
$$\text{s.t.: } (x,y) \in \mathcal{D} = \{(x,y) \in \mathbb{R}^2 \mid g(x,y) = 1 - x^2 - y^2 \geq 0\}.$$

   a. Set up the Lagrangian
   b. Enumerate the Kuhn-Tucker conditions
   c. Solve for the maximum