## Homework 9

Due on December 7<sup>th</sup>, 2004 at class

Name: \_\_\_\_\_

ID:\_\_\_\_\_

- 1. A firm has a production function as  $y = f(x_1, x_2) = Ax_1^{1/2}x_2^{1/4}$ .  $x_1$  and  $x_2$  are two input factors, and their prices are  $w_1$  and  $w_2$  respectively. p is the price of output y. (45 points)
  - a) What kind technology does this firm has?
  - b) What is the marginal products of  $x_1$  and  $x_2$  respectively?
  - c) Write down the profit function for this firm in the long run?
  - d) Solve the factor demand functions of  $x_1$  and  $x_2$  in the long run. (Write down every steps for you to solve them)
- 2. Another firm has a production as  $y = f(x_1, x_2) = 10x_1^{1/3}x_2^{4/3}$ .  $x_1$  and  $x_2$  are two input factors, and their prices are  $w_1$  and  $w_2$  respectively. p is the price of output y. The firm has set the target level of production as  $\overline{y}$ . (55 points)
  - a) What is the total cost function of this firm?
  - b) Write down the isocost function.
  - c) What is the slope of isoquant for this firm?
  - d) Solve the conditional factor demand functions of  $x_1$  and  $x_2$ ? (Write down every steps for you to solve them.)
  - e) What is the difference between factor demand functions and conditional factor demand function?
  - f) What kind of return to scale does this firm's technology show?