

## Ec306 Homework 5

- Which of the following production functions exhibit constant returns to scale? In each case  $y$  is output and  $K$  and  $L$  are inputs. (1)  $y = K^{1/2}L^{2/3}$  (2)  $y = 3K^{1/2}L^{1/2}$  (3)  $y = K^{1/2} + L^{1/2}$  (4)  $y = 2K + 3L$ .
  - 1,2, and 4
  - 2,3, and 4
  - 1,3, and 4
  - 2 and 3
  - 2 and 4
- A competitive firm produces output using three fixed factors and one variable factor. The firm's short run production function is  $q = 163x - 2x^2$ , where  $x$  is the amount of variable factor used. The price of output is \$3 per unit and the price of the variable factor is \$9 per unit. In the short run, how many units of  $x$  should the firm use?
  - 20
  - 80
  - 19
  - 40
  - 10
- A firm's production function is  $q = 16x^{1/2}y^{1/2}$  where  $x$  and  $y$  are the amounts of factors  $x$  and  $y$  that the firm uses as inputs. If the firm is minimizing unit costs, and if the price of factor  $x$  is 6 times the price of factor  $y$ ; the ratio in which the firm will use factors  $x$  and  $y$  is closest to:
  - $x/y = 0.17$
  - $x/y = 0.33$
  - $x/y = 1$
  - $x/y = 2$
  - $x/y = 6$

4. A goatherder has the cost function  $c(y) = 5y^2$  where  $y$  is the number of tubs of goat cheese she makes per month. She faces a competitive market for goat cheese, with a price of \$100 a tub. How many tubs should she produce per month?

**a** 100

**b** 25

**c** 10

**d** the square root of 20

**e** 5

This homework is due in class Tues. Nov. 6. Please show your reasoning along with your answers.