

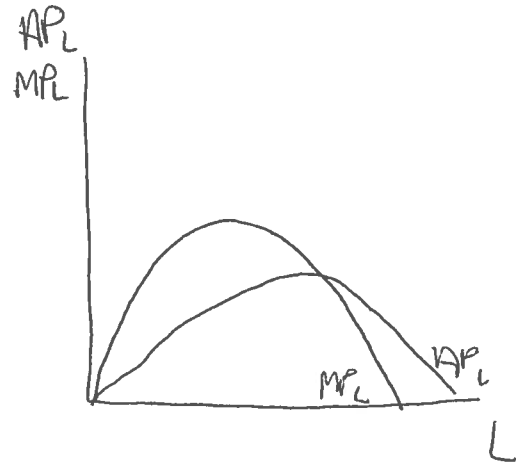
IN-CLASS ASSIGNMENT: Production (SR)

Monday, March 16, 2015

Name: ANSWER KEY

1. Assume that capital is fixed in the short run but labor is variable. Generally speaking, when will average product of labor rise and fall? Note- look at the relationship between marginal production, MP_L , and average product, AP_L .

$AP_L \uparrow$ when $MP_L > AP_L$
 $AP_L \downarrow$ when $MP_L < AP_L$



2. A good is produced according to the production function $Q = 10K^{0.25}L^{0.5} - L$.
 a. Calculate the marginal product of labor, MP_L .

$$MP_L = \frac{dQ}{dL} = 10(0.5)K^{0.25}L^{-0.5} - 1$$

$$MP_L = 5K^{0.25}L^{-0.5} - 1$$

- b. Assume that K is fixed in the short run at 256, or $K = 256$. Find the amount of labor, L , such that $MP_L = 0$ or the amount of labor when total product begins to decline.

$$MP_L = 5(256)^{0.25}L^{-0.5} - 1 = 0$$

$$= 5(4)L^{-0.5} - 1 = 0$$

$$= 20L^{-0.5} = 1 \Rightarrow L^{-0.5} = \frac{1}{20} \Rightarrow \frac{1}{L^{0.5}} = \frac{1}{20}$$

$$(L^{0.5})^2 = (20)^2$$

$$L = 400$$

