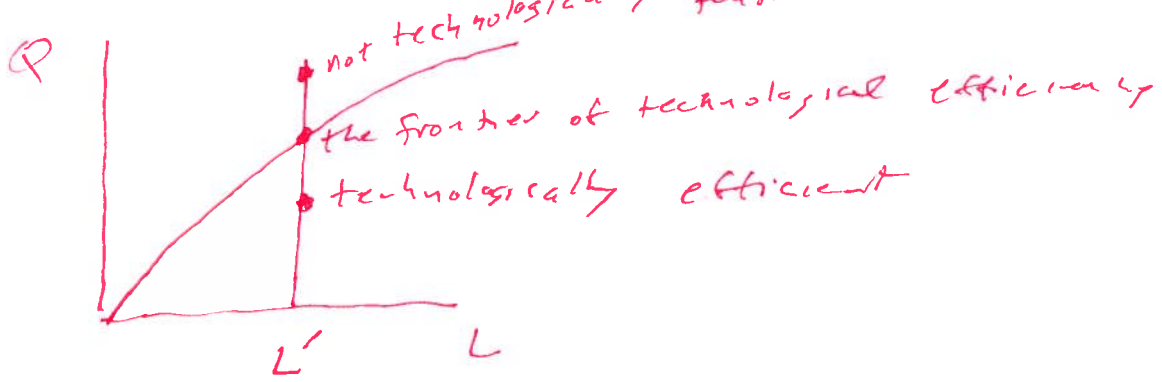
Problem Set #4
PPA897
Professor John McPeak

Name: KEY

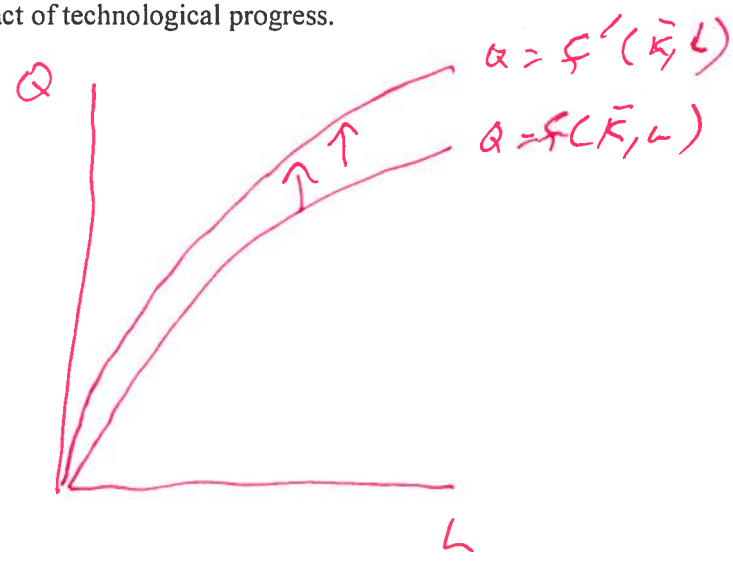
Due _____

1) Production functions

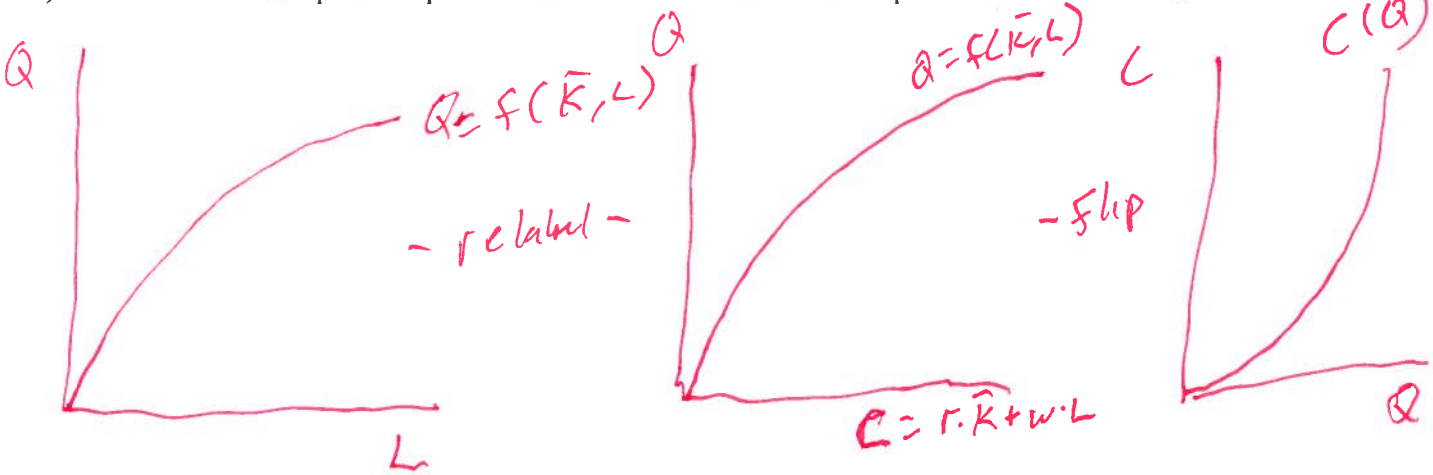
a) Draw a production function and for a given input level illustrate the areas of your graph that correspond to an output level that is: not technologically feasible, the frontier of technological efficiency, and technologically inefficient.



b) Draw a production function. Illustrate on this production function how you could illustrate the impact of technological progress.

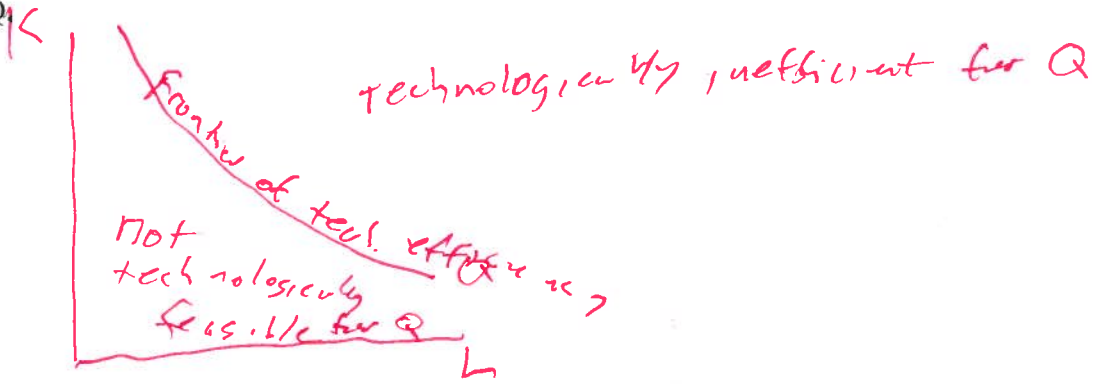


c) Illustrate how the shape of the production function is related to the shape of the total cost curve.

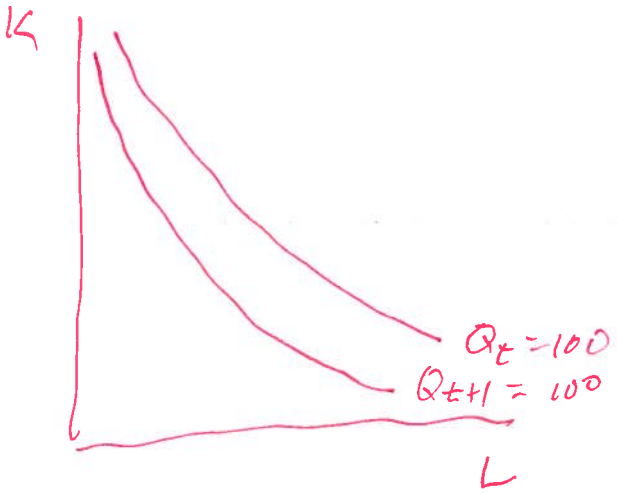


2) Isoquants

a) Draw an isoquant and illustrate the areas of your graph that correspond to input bundles that are: not technologically feasible, the frontier of technological efficiency, and technologically inefficient for output level Q_t



b) Illustrate using isoquants the impact of technological progress.



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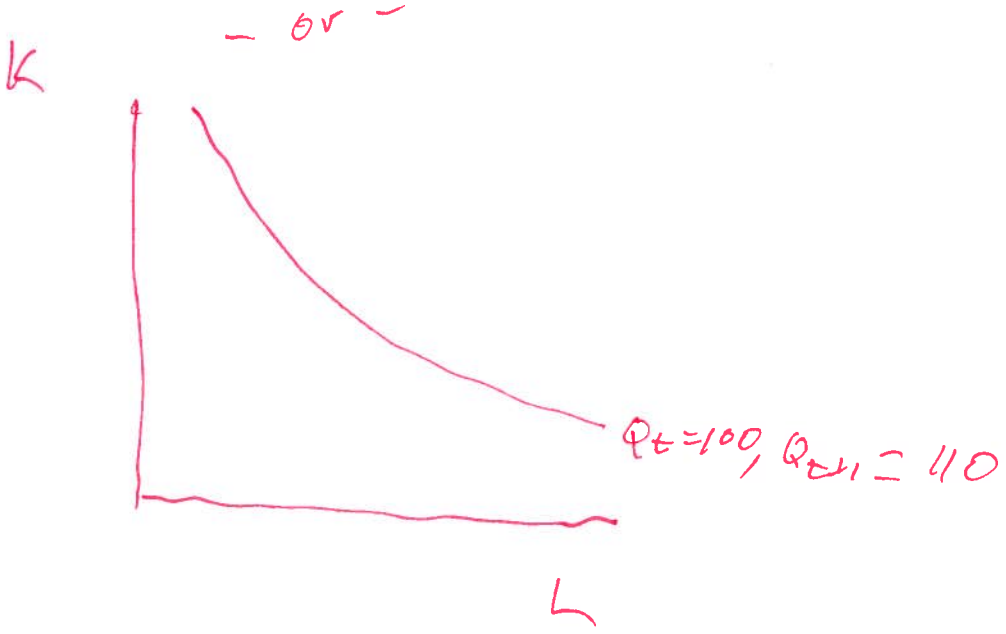
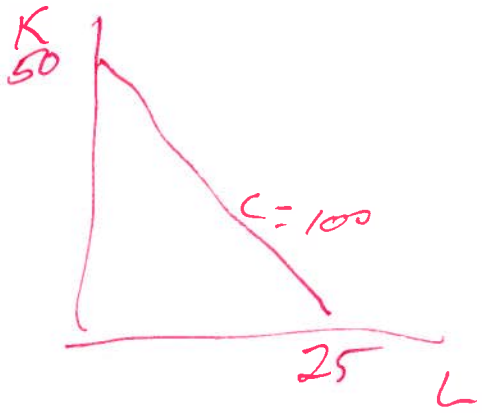
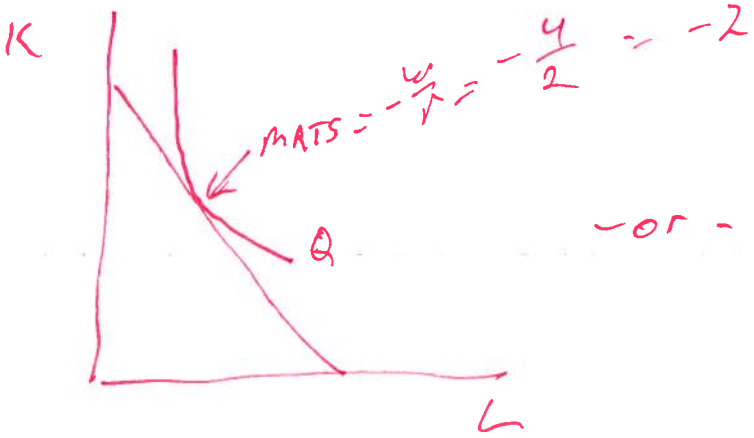


3) Assume the rental rate of capital is 2, and the wage rate is 4. $100 = 2 \cdot K + 4 \cdot L$

a. Draw an isocost curve for a cost level of 100.



b. What should the marginal rate of technical substitution be at an economically efficient bundle?



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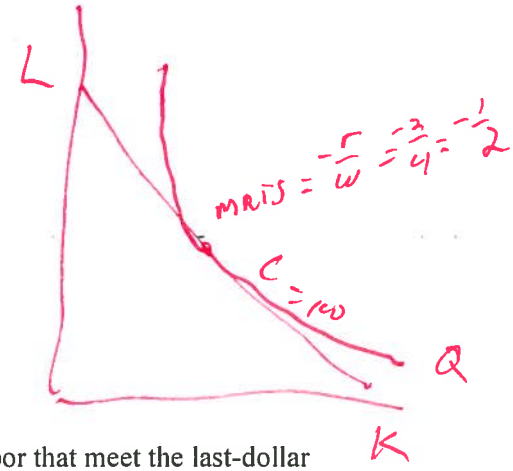


c. Provide values for a possible set of marginal products for capital and labor that meet the last-dollar rule.

$\frac{MP_K}{r} = \frac{MP_L}{w}$, $\frac{MP_K}{2} = \frac{MP_L}{4}$

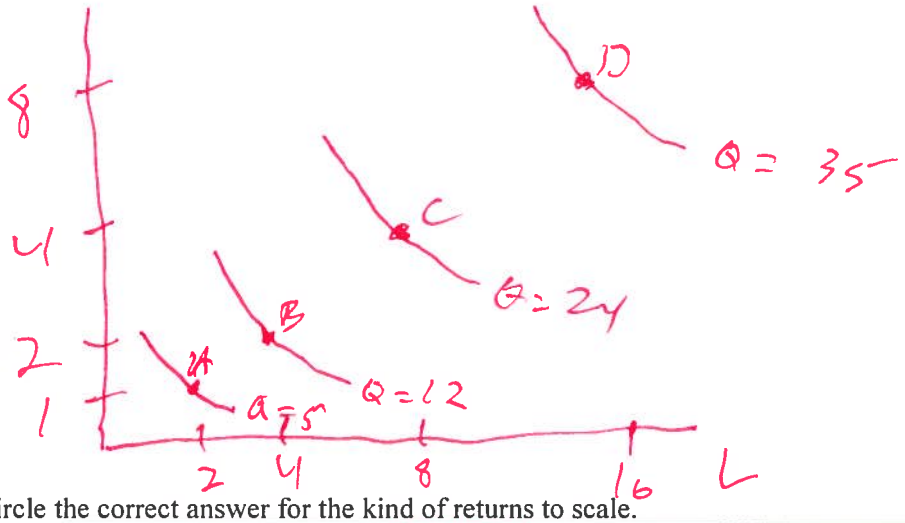
So

MP_K	MP_L
1	2
2	4
3	6
4	8
.	
.	

4) Returns to Scale

	Capital	Labor	Output
A	1	2	5
B	2	4	12
C	4	8	24
D	8	16	35

a) Illustrate using isoquants points A, B, C, and D.



Circle the correct answer for the kind of returns to scale.

Move from A to B	Increasing, Constant, Decreasing returns to scale
Move from B to C	Increasing, Constant, Decreasing returns to scale
Move from C to D	Increasing, Constant, Decreasing returns to scale