# Long Run Production

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Introduction

Please read pages 144 to 158 (Section 5.3) of the textbook and then try to answer the following questions. If there are any areas that you have dificulty understanding, please bring these to the seminar session.

1. Provide one example of the following *economies of scale*

   - Specialisation or division of labour
   - Indivisibility
   - Plant economies of scale
   - Spreading overheards
   - Financial economies

2. What does a firm do to gain *external economies of scale*? Provide one example

3. Where MPP_L is the Marginal Physical Product of Labour and MPP_K is the Marginal Physical Product of Capital and P_L and P_K are the price of labour and capital respectively,

   - Explain $\frac{MPP_L}{P_L} \geq \frac{MPP_K}{P_K}$
   - What should the firm do in this situation?
   - Explain $\frac{MPP_i}{P_i} = \frac{MPP_j}{P_j} \ldots \frac{MPP_k}{P_k}$

4. Using figure 1, label the *isocost* and *isoquant* curves.

5. Using the information that labour cost 15 pounds per hour and capital costs 15 pounds per hour, what is the lowest cost of producing 50 units of output?

Figure 1: Isoquants and Isocosts
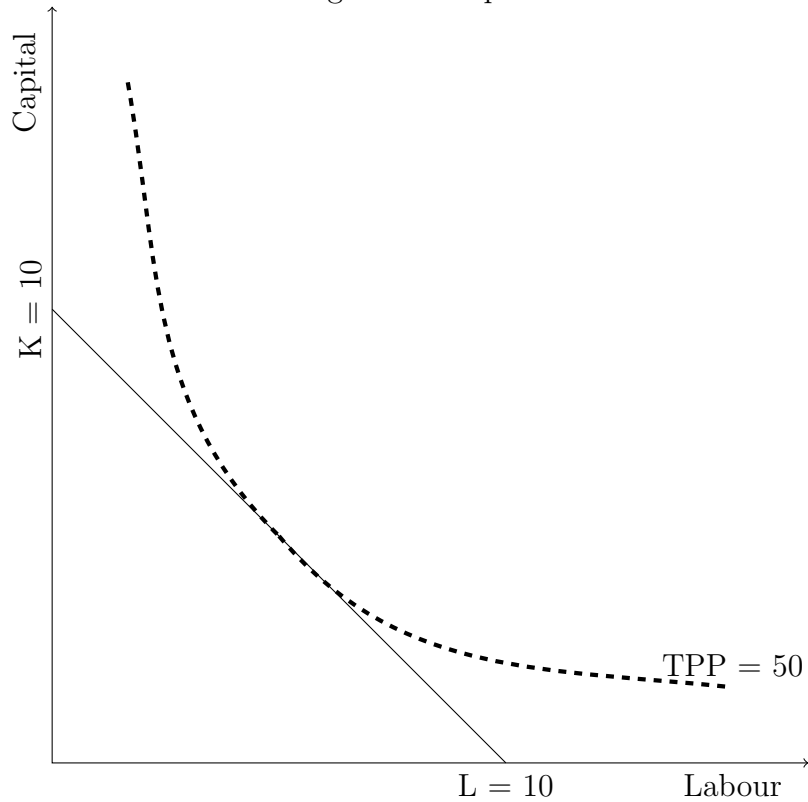
6. If the cost of Labour doubles in price to 20 pounds per hour, how would this be represented on the diagram? What would it mean for output?

7. what do the slopes of the isocost and isoquant curves represent?

8. Explain why $\frac{MPP_k}{P_k} = \frac{MPP_L}{P_L}$ at the lowest cost combination of factors that can produce a given level of output.