Engineering in ICT

Galiya Berdykulova

The First part: Why Production Function?

What is the general and final purpose of an enterprise?

How can an enterprise get it?

Production is…..

Why Production Function?

Production

Economic Concept

Money circulation

M-C-M’

Engineering Concept

Transformation

input

Factors of Production

Resources

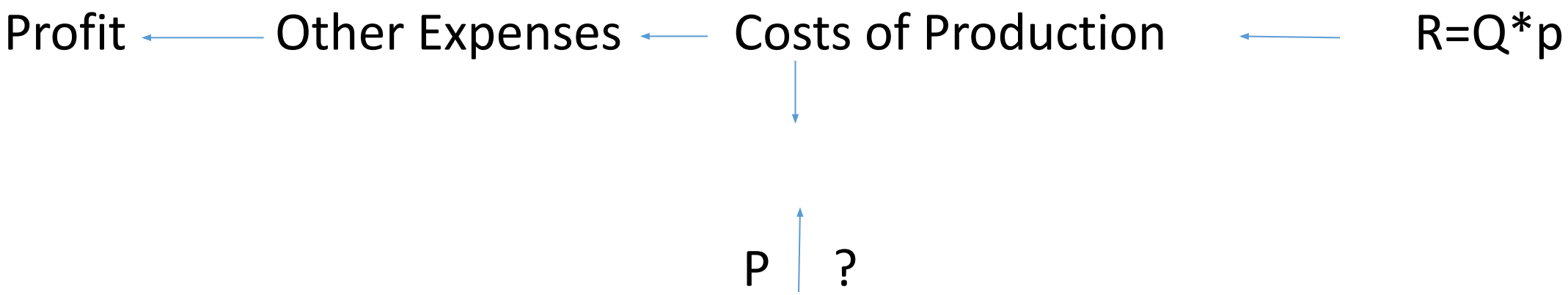
output

Goods

Services

What is the general and final purpose of an enterprise?

To get PROFIT and avoid LOSS



The 2nd Part: What is Production Function for?

A **production** is purely an engineering concept.

If you plug in the amount of labor, capital and other inputs the firm is using, the **production** function tells how much output will be **produced** by those inputs.

Note: Correct the statement of production in the above sentence (obligatory)

Information for thinking

Once G. Ford was asked:
What model of your car is now off
the assembly line
and what technical innovations does it posses?

The answer was this:
I have no idea
which model is off the assembly line now,
but I know exactly how much money it will bring me.

Production Factors

Factor	Resource	Benefit
?	?	?
?	?	?
?	?	?
?	?	?
?	?	?

Types of Capital

Type of capital	Type of physical capital	
?	Real capital	
?	Active	Passive
?	Equipment	Building
?	Machinery	Construction
	Tools	Bridge
Labor	Labor force	
Period of time of Factor of Production functioning	Short run	Long run
	Labor force is variable Real capital is fixed	Labor force is variable Real capital is variable

The3rd Part: Production Function: Assumption

Assume:

I. There are hired 2 Factors of Production :

Labor force and Real Capital.

Period of functioning of production process is short run.

Then:

Variable factor is_____.

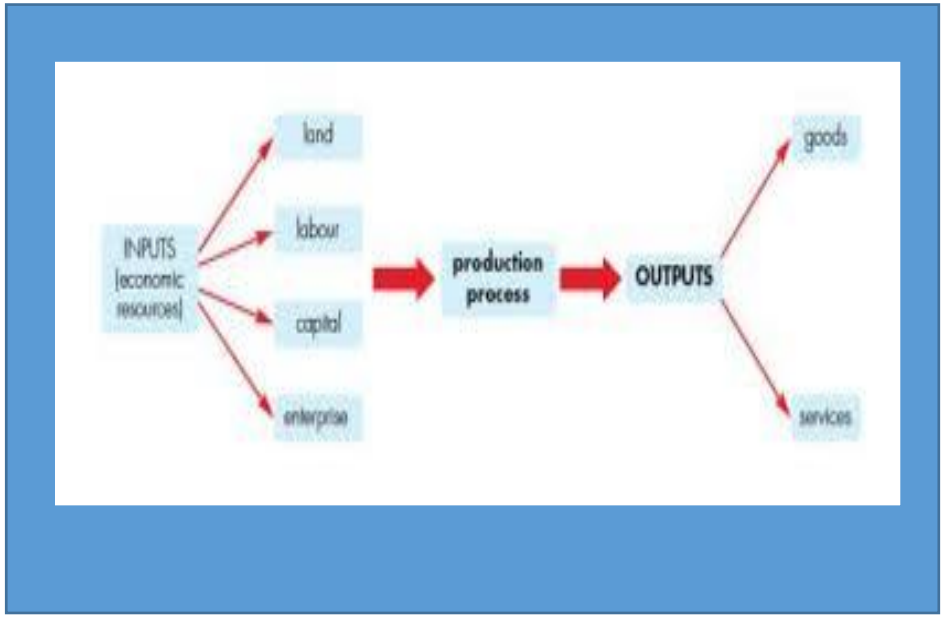
Fixed factor is_____.

Terms and formulas

- Alternative terms in reference to inputs
  - ‘inputs’
  - ‘factors’
  - ‘factors of production’
  - ‘resources’

- Alternative terms in reference to outputs
  - ‘output’
  - ‘quantity’ (Q)
  - ‘total product’ (TP)
  - ‘product’

Production

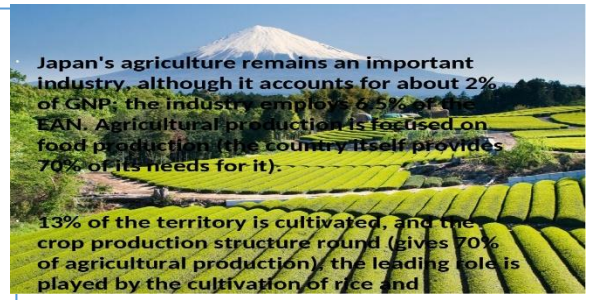


Production is a

Industrial Engineering and Production

Production is a process of combining various material inputs and immaterial inputs (plans, know-how) in order to make output for consumption

It is the act of creating an output, a good or service which has value and contributes to the utility of individuals.



Total,
Average, and Marginal product

Marginal product (MP) = change in output (Total Product) resulting from a unit change in a variable input

$$MP_X = \frac{\Delta Q}{\Delta X}$$

Average product (AP) = Total Product per unit of input used

$$AP_X = \frac{Q}{X}$$

Short-run analysis of Total, Average, and Marginal product

Law of diminishing returns:

as additional units of a variable input are combined with a fixed input, after some point the additional output (i.e., marginal product) starts to diminish

Short-run analysis of Total, Average, and Marginal product

The **Three Stages of Production** in the short run:

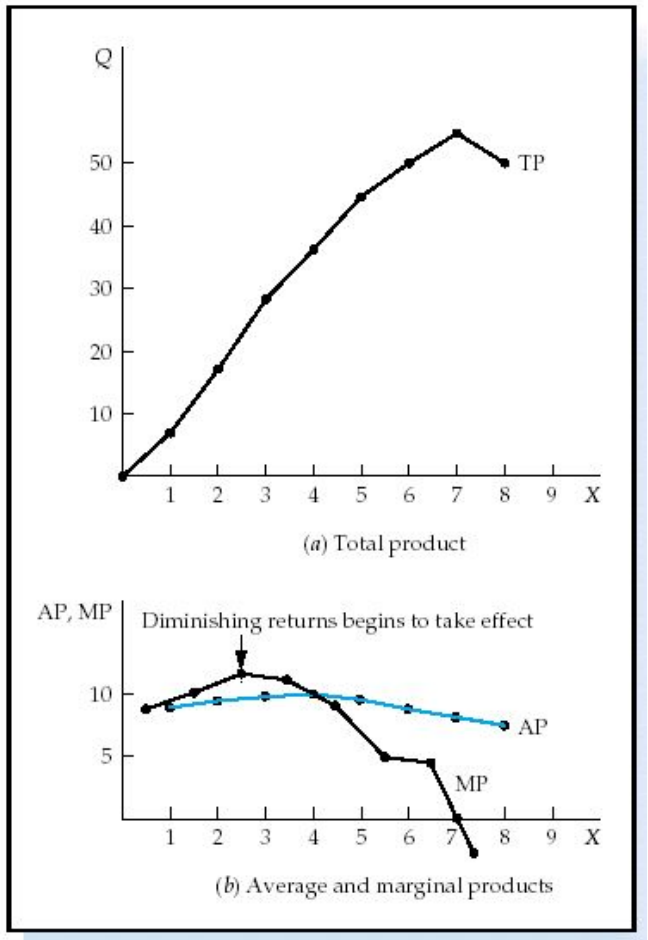
- Stage I: from zero units of the variable input to where AP is maximized (where MP=AP)
- Stage II: from the maximum AP to where MP=0
- Stage III: from where MP=0

Short-run analysis of Total, Average, and Marginal product

if MP > AP then AP is rising

if MP < AP then AP is falling

MP=AP when AP is maximized



Sum up

I. In Word document, please ,write What have you learned on this lecture?

Keep in your mind three parts of the lecture and do conclusion for each of them.

II. Write key terms of the lecture.

III. Send the file to dl.iitu.kz/Economics and Industrial Engineering/WEEK 7/ MY ANSWER FOR LECTURE'S QUESTIONS(Sum up)

Short-run analysis of Total, Average, and Marginal product

What level of input usage within Stage II is best for the firm?

 answer depends upon:

- how many units of output the firm can sell
- the price of the product
- the monetary costs of employing the variable input