

Formula Chart – AP Microeconomics

Unit 2 – Supply and Demand

Total Revenue = price x quantity

Total revenue test

P↑ and TR↓ then demand elastic
P↑ and TR↑ then demand inelastic
P↓ and TR↑ then demand elastic
P↓ and TR↓ then demand inelastic

Coefficient of price elasticity of demand:

$$\frac{\% \Delta \text{ quantity demanded}}{\% \Delta \text{ price}}$$

$$\frac{(Q_2 - Q_1)}{(Q_1 + Q_2)/2} \div \frac{(P_2 - P_1)}{(P_1 + P_2)/2}$$

Coefficient > 1 = elastic demand
Coefficient < 1 = inelastic demand
Coefficient = 1 = unit elastic demand
Coefficient = ∞ = perfectly elastic demand
Coefficient = 0 = perfectly inelastic demand

Cross elasticity of demand: comparing 2 items:

$$\frac{\% \Delta \text{ quantity of 1}^{\text{st}} \text{ item}}{\% \Delta \text{ price of 2}^{\text{nd}} \text{ item}}$$

Cross elasticity coefficient positive = items substitute for each other
Cross elasticity coefficient negative = items complement each other

Income elasticity of demand: $\frac{\% \Delta \text{ quantity}}{\% \Delta \text{ income}}$

Income elasticity coefficient positive = normal good
Income elasticity coefficient negative = inferior good

Supply elasticity: $\frac{\% \Delta \text{ quantity supplied}}{\% \Delta \text{ price}}$

Tax Revenue = (Price w/tax – price seller receives) x Quantity

Utility maximization rule

$$\frac{\text{Marginal Utility of Good A}}{\text{Unit cost of A}} = \frac{\text{Marginal Utility of Good B}}{\text{Unit cost of B}}$$

Unit 3 – Production Markets

Revenue:

Total Revenue = price x quantity

$$\text{Average Revenue} = \frac{\text{TR}}{\text{Q output}}$$

$$\text{Marginal Revenue} = \frac{\Delta \text{TR}}{\Delta \text{Q output}}$$

TR @ maximum when MR goes negative

In perfect competition, MR = price (demand) for individual sellers

In perfect competition, individual seller price = market price (price taker)

In imperfect competition, MR < price (Demand)

In imperfect competition, individual seller IS THE MARKET (price maker)

Cost:

Total Cost = Total fixed cost + Total average cost

Total Cost = unit cost x quantity output

$$\text{Average fixed cost} = \frac{\text{TFC}}{\text{Q output}}$$

$$\text{Average variable cost} = \frac{\text{TVC}}{\text{Q output}}$$

$$\text{Average total cost} = \frac{\text{TC}}{\text{Q output}}$$

Average total cost = AFC + AVC

$$\text{Marginal cost} = \frac{\Delta \text{TC}}{\Delta \text{Q output}}$$

Product (aka output):

$$\text{Average product} = \frac{\text{Total product}}{\text{Q input}}$$

$$\text{Marginal product} = \frac{\Delta \text{TP}}{\Delta \text{Q input}}$$

TP @ maximum when MP goes negative

In perfect competition market supply = ∑ individual seller cost curves or S = ∑ mc's

Unit 3 – Production Markets continued

Profit:

Profit maximization rule for all markets:

Marginal Revenue = Marginal Cost or $MR = MC$

Total cost + total profit = total revenue
also $TR = \text{Price} \times \text{quantity}$

Total cost = unit cost \times quantity

Total profit = unit profit \times quantity

Unit 4 – Resource Markets

Marginal revenue product = $\frac{\Delta TR}{\Delta Q \text{ of resource}}$

Marginal resource cost = $\frac{\Delta T \text{ resource } C}{\Delta Q \text{ of resource}}$
aka *Marginal factor cost*

Profit maximization rule when purchasing a single resource:

Marginal Revenue Product = Marginal Resource Cost
or
 $MRP = MRC$

In perfect competition market demand for labor = \sum
demand of all individual purchasers of labor or $D = \sum \text{mrp's}$

In perfect competition, $MRP = \text{product price} \times$
marginal product

In imperfect competition, $MRP = \text{product price} \times$
marginal product MINUS price change on
previous units sold

In perfect competition, market wage = individual
firms MRC (wage taker)

In imperfect competition (monopsony), wage is
 $MRP = MRC$ @ labor supply curve (wage
maker) /MRC lies above S curve

$\frac{\text{Total product (output)}}{\text{Average product}} = \# \text{ of workers}$

Average total cost = Total cost \div output (product)

Least Cost Rule

$$\frac{\text{Marginal product of labor}}{\text{Unit price of labor}} = \frac{\text{Marginal product of capital}}{\text{Unit price of capital}}$$

Profit maximization rule for purchasing
multiple resources

$$\frac{\text{Marginal product of labor}}{\text{Unit price of labor}} = \frac{\text{Marginal product of capital}}{\text{Unit price of capital}} = 1$$

Unit 5 - Government

Externalities

Market Equilibrium

$MPC = MPB$

Marginal Private Cost = Marginal Private Benefit

Socially Optimal Allocation

$MSC = MSB$

Marginal Social Cost = Marginal Social Benefit

Negative production externality (overallocation):

Social cost $>$ private cost

Example: pollution

Fix: taxes, regulations

Positive production externality (underallocation):

Social cost $<$ private cost

Example: technology

Fix: subsidies, regulations

Negative consumption externality (overallocation):

Social benefit $<$ private benefit

Examples: cigarettes, alcohol, gambling

Fix: taxes, regulations

Positive consumption externality (underallocation):

Social benefit $>$ private benefit

Examples: education, vaccines, smoke alarms

Fix: taxes, subsidies or regulations