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:

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

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

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

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

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

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

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

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

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

Average total cost = AFC + AVC

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

Product (aka output):

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

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

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 = Price x quantity

Total cost = unit cost x quantity

Total profit = unit profit x quantity

Unit 4 – Resource Markets

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

$$\text{Marginal resource cost} = \frac{\Delta \text{ T resource C}}{\Delta \text{ Q of resource}}$$
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 = $\sum$ mrp's

In perfect competition, MRP = product price x marginal product
In imperfect competition, MRP = product price x 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

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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: MSB = MSC

Market Equilibrium
MPC = MPB
Marginal Private Cost = Marginal Private 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