AP Microeconomics Midterm Study Guide

Scarcity, Opportunity Costs, and Trade Offs
- Scarcity: limited nature of society's resources
- Opportunity Costs: the value of the next best thing that is given up when a choice is made
  - (ex: when Carla goes to college, her O.C is the $$$ she would have made doing something else with her time)
- Trade Offs: whatever must be given up to obtain some item
  - **T**rade off is **t**angible

Productions Possibility Frontier
- 4 Key Assumptions
  - 1) Only 2 goods can be produced
  - 2) Full employment of resources
  - 3) Fixed technology
  - 4) Fixed resources (*Ceteris Paribus*)
- PPF / PPC / PPG: a model that shows alternative ways an economy can use its resources by evaluating scarcity, trade offs, opportunity costs, and efficiency. Shows the combinations of output that an economy can possibly produce given the available factors of production and the available production technology.

- Straight Line: Follows the law of constant opportunity cost, meaning that resources are easily adaptable for producing either good.
- Bowed Out: Follows the law of increasing opportunity costs, meaning that as you produce more of any good, the opportunity cost (foregone production of another good) will increase; resources are NOT easily adaptable to producing both goods. Also known as a concave PPC.
- When points move along the curve, the market is at productive efficiency.
- Points outside of PPC: unattainable given present resources, can ONLY be reached with trade
- Shifters of PPC
  - 1) Change in resource quantity or quality
  - 2) Change in technology
  - 3) Change in trade

Specialization
- Who has the _____ ?
  - Comparative Advantage: producer with lowest opportunity cost, determined by price per unit
  - Absolute Advantage: produce who can produce the most output with the least amount of resources
- To calculate comparative advantages for 2 countries and determine who should produce what, use the OOO method for outputs and IOU method for inputs.
- Terms of trade are between opportunity costs.

Supply and Demand
- Law of Demand: the claim that, all things equal, the quantity demanded of a good falls when the price of the good rises (there is an inverse relationship between price and quantity demanded)
- Law of Supply: the claim that, all things equal, the quantity supplied of a good rises when the price also rises (direct relationship between quantity supplied and price)
- movement along a curve will only occur due to a change in price
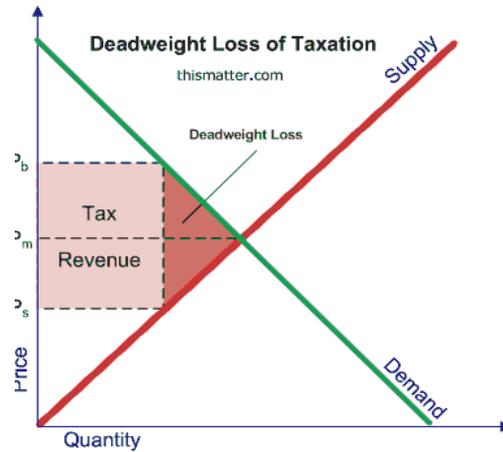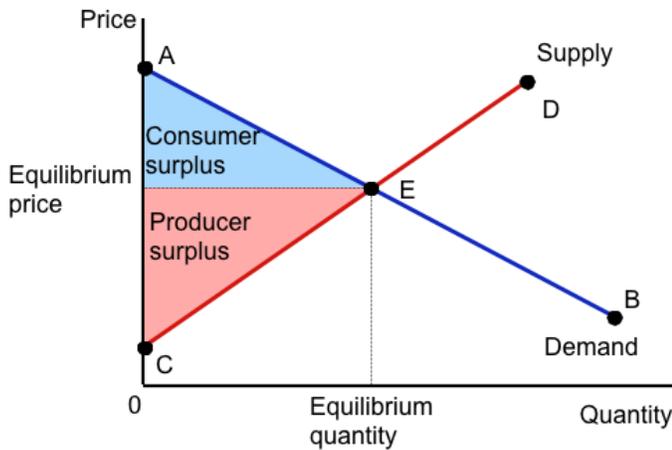- shifts in curve:

Shifters of Demand	Shifters of Supply
MERIT ● Market Size ● Expected Prices ● Related Prices ● Income ● Tastes	TRICE ● Technology ● Related Prices ● Input Prices ● Competition ● Expected Prices

- Equilibrium: a situation in which the market price has reached the level at which quantity supplied equals quantity demanded.

Consumer Surplus / Producer Surplus / Deadweight Loss
- Consumer Surplus: the amount a buyer is willing to pay for a good minus the amount the buyer actually pays for it.
- Producer Surplus: the amount a seller is paid for a good minus the seller's cost of providing it.
- Deadweight Loss: the fall in total surplus that results from a market distortion,

such as a tax.

Marginal Utility
- The benefit or satisfaction from consuming a good or service is called utility or utils.
- Marginal Utility: the change in total utility that results from a one-unit increase in the quantity of a good consumed.
- Total utility: the total benefit a person gets from the consumption of goods. Generally, more consumption gives more utility.
- To calculate:
  - Marginal Utility → change in total utility / change in price
  - Marginal Utility per dollar → MU / price
- Utility Maximizing Rule (use when you have more than one good):

$$\frac{MUx}{P_x} = \frac{MUy}{P_y}$$

Normal & Inferior Goods
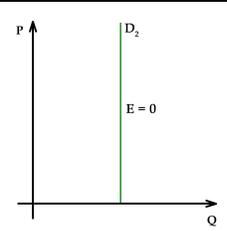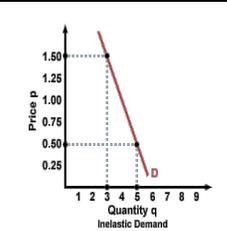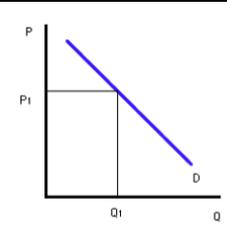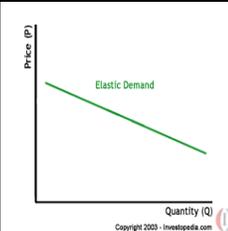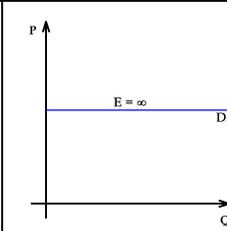- Normal Good: a good for which, all things equal, an increase in income leads to an increase in demand (ex: iphones, frappuccinos, waffles at JJ's dinner, Mercedes Benz vehicles)
- Inferior Good: a good for which, all things equal, an increase in income leads to a decrease in demand (ex: public bus rides, Kroger version of Lucky Charms, Taco Bell)

Substitutes and Complements
- Substitutes: two goods for which an increase in the price of one leads to an increase in the demand for the other (ex: DVD rentals and movie tickets, Mcdonalds and Wendy's, flip flops and sandals)
- Complements: two goods for which an increase in the price of one leads to a decrease in the demand for another (ex: peanut butter and jelly, hot fudge and ice cream, macbooks and macbook cases)

Elasticity of Demand
- Elasticity: a measure of the responsiveness of quantity demanded or quantity supplied to a change in one of its determinants
- Price Elasticity: a measure of how much quantity demanded of a good responds to a change in the price of that good.
- Influences of elasticity of demand:
  - availability of close substitutes (ex: butter and I-can't-believe-it's-not-butter)
  - necessities vs. luxuries (ex: the demand for milk is fairly inelastic, while the demand for German chocolate candies is elastic)
  - definition of the market → more specific = more elastic (ex: broad market of food vs. specific market of waffles)
  - time horizon → longer time horizons = usually, more elastic demand (ex: gas is inelastic in a short amount of time, but in a longer time span, gas is elastic because people will buy more fuel-efficient cars or will turn to public transportation)

Perfectly Inelastic Demand	Inelastic Demand	Unit Elastic Demand	Elastic Demand	Perfectly Elastic Demand

- Total Revenue: the amount paid by buyers and received by sellers of a good, computed as the price of the good times the quantity sold.
  - TR = Price x Quantity
  - Total Revenue Test

Elastic Demand
- Price increase causes TR to decrease
- Price decrease causes TR to increase

Inelastic Demand
- Price increase causes TR to increase
- Price decrease causes TR to decrease

Unit Elastic
- Price changes and TR remains unchanged

- Something can be inelastic if it is has few substitutes, is a necessity, is a broad market, and/or has a short time horizon.
- Price Elasticity of Demand formula:

$$| E_d |= \frac{\dfrac{Q_2 - Q_1}{\left(\dfrac{Q_2 + Q_1}{2}\right)}}{\dfrac{P_2 - P_1}{\left(\dfrac{P_2 + P_1}{2}\right)} } = \frac{\%\Delta Q}{\%\Delta P}$$

If E = 1, then the demand is unit elastic
If E > 1, then the demand is elastic
If E < 1, then the demand is inelastic

- Income Elasticity of Demand: measures the responsiveness of quantity demanded to a change in income and is what determines whether or not goods are normal or inferior. The formula:

$$Ei = \frac{\% \text{ change in quantity}}{\% \text{ change in income}}$$

If Ei > 0, then the good is normal.
If Ei < 0, then the good is inferior.

- Cross Price Elasticity of Demand: shows how sensitive the quantity demanded of a

product is to the change in price of another good, and determines whether goods are complements or substitutes.

$$Eab = \frac{\text{\% change in quantity of product “b”}}{\text{\% change in price of product “a”}}$$

If Eab > 0, then the good or service is a substitute.
If Eab < 0, then the good or service is a complement.

Elasticity of Supply
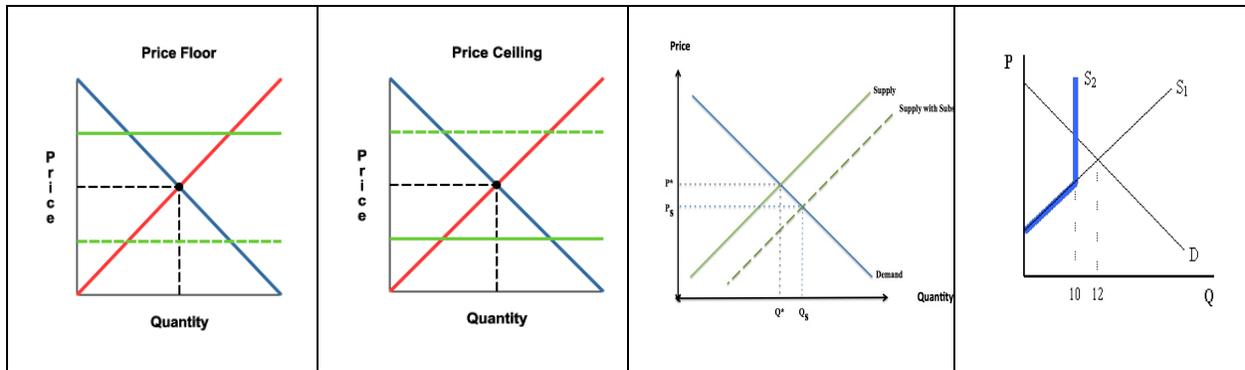- Price Elasticity of Supply: a measure of how much the quantity supplied of a god responds to a change in the price of that good
- different than demand because it depends on the flexibility of sellers to change the amount of the good they produce (including time limitation)
- Price Elasticity of Supply formula:

$$E_s = \frac{\dfrac{Q_2 - Q_1}{\left(\dfrac{Q_2 + Q_1}{2}\right)}}{\dfrac{P_2 - P_1}{\left(\dfrac{P_2 + P_1}{2}\right)}} = \frac{\%\Delta Q}{\%\Delta P}$$

Price Floor, Price Ceilings, Subsidies, and Quotas
- Price Ceiling: a legal maximum on the price at which a good can be sold
- Price Floor: a legal minimum on the price at which a good can be sold
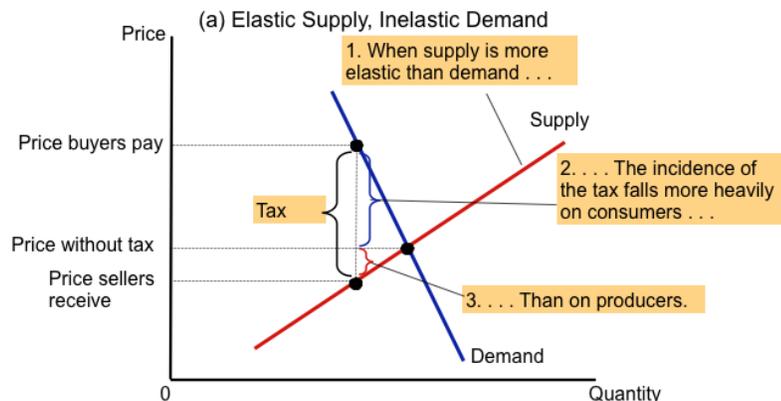 - These are used by governments to make a society more equal.

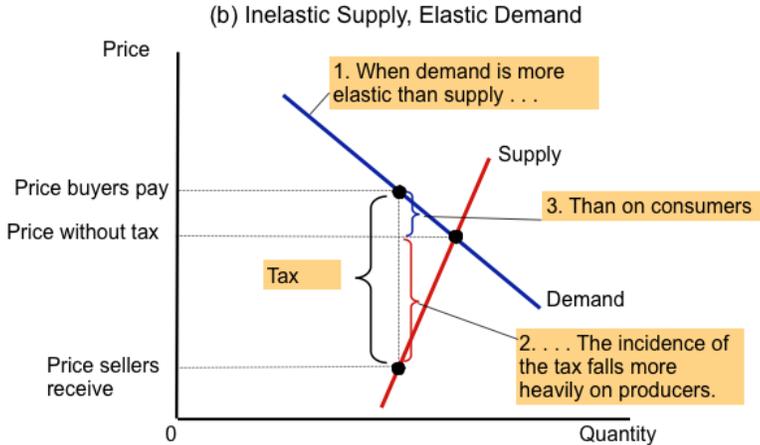| Price Floor	Price Ceiling	Subsidy	Quota

- If a price ceiling is above the equilibrium price, then a surplus will result. If a price ceiling is below the equilibrium price, then there will be a shortage.

Taxes
- Proportional Tax: high and low income taxpayers pay the same fraction of income
- Progressive Tax: high-income taxpayers pay a larger fraction of their income than do low-income taxpayers
- Regressive Tax: high-income taxpayers pay a smaller fraction of their income than do low-income taxpayers (ex: flat tax)
- Excise Tax: a tax charged on each unit of a good or service that is sold.
  - it raises the price paid by consumers and reduces the price received by sellers
  - discourages consumption of a certain good (aka: "sin tax")
  - an excise tax decreases demand and reduces the overall quantity sold (thus, supply curve stays the same, while demand curve shifts downward)
  - the total amount of a tax collected is determined by the difference between the price paid by consumers and the amount received by sellers.
- Tax Incidence: manner in which the burden of a tax is shared among participants in a market ---> relates to elasticity!
  - Very elastic supply and relatively inelastic demand
    - Sellers – small burden of tax
    - Buyers – most of the burden

- ○ Relatively inelastic supply and very elastic demand
  - ■ Sellers – most of the tax burden
  - ■ Buyers – small burden

(b) Inelastic Supply, Elastic Demand

Price

1. When demand is more elastic than supply . . .

Supply

Price buyers pay

Price without tax

3. Than on consumers

Tax

Demand

2. . . . The incidence of the tax falls more heavily on producers.

Price sellers receive

0   Quantity

Negative and Positive Externalities
- Negative Externality: when a firm's production reduces the well-being of others who are not compensated by the firm (ex: pollution, bad smells)
  - ○ Price decreases due to decrease in demand, while supply remains unchanged
  - ○ Social Marginal Cost > Firm's Marginal Cost
- Positive Externality: when a firm's production increases the well-being of others who are not compensated by the firm (ex: flowers in a neighbor's yard)
  - ○ Price increases due to increase in demand, while supply remains the same
  - ○ Social Value > Private Value

Lorenz Curve
- Lorenz Curve: A graphical representation of wealth distribution developed by American economist Max Lorenz in 1905. On the graph, a straight diagonal line represents perfect equality of wealth distribution; the Lorenz curve lies beneath it, showing the reality of wealth distribution. The difference between the straight line and the curved line is the amount of inequality of wealth distribution, a
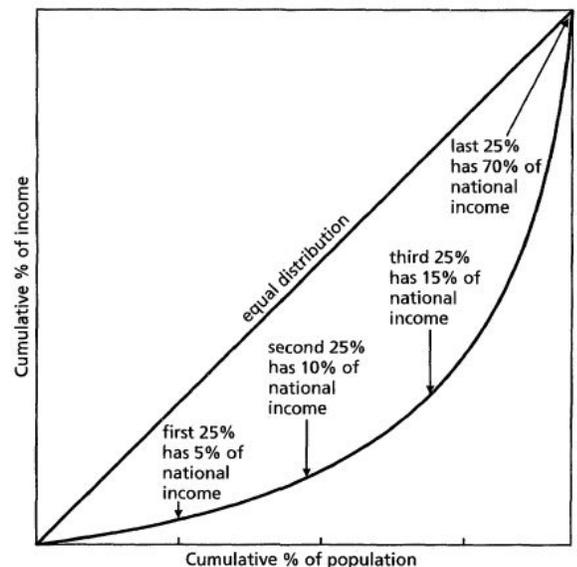
Cumulative % of income

equal distribution

last 25% has 70% of national income

third 25% has 15% of national income

second 25% has 10% of national income

first 25% has 5% of national income

Cumulative % of population

figure described by the Gini coefficient.
- Relates to the debate of equity vs. efficiency

Law of Diminishing Returns
- Law of Diminishing Marginal Returns: as variable resources are added to fixed resources, the additional output produced from each new worker will eventually fall. (Why? Because people get in each others way!)
- Stop when Marginal Returns = Marginal Cost (MR=MC)
- To calculate:
  - Marginal Product = Change in Total Product / Change in Inputs
    - MP = ΔTP / Δ Inputs

Costs of Production
- Fixed Costs (FC): costs for fixed resources that DON'T change with the amount produced
  - Ex: Rent, Insurance, Managers Salaries .
- Variable Costs (VC): costs for variable resources that DO change as more or less is produced
  - Ex: Raw Materials, Labor, Electricity
- Total Cost (TC): market value of the inputs a firm uses in production
  - Sum of fixed and variable costs $\rightarrow$ TC = FC + VC
- Marginal Cost (MC): additional costs of an additional output.

$$\text{Marginal Cost} = \frac{\text{Change in Total Costs}}{\text{Change in Quantity}}$$

- Average Variable Cost (AVC): variable costs divided by quantity

$$\text{Average Variable Costs} = \frac{\text{VariableCosts}}{\text{Quantity}}$$

- Average Total Cost (ATC): total costs divided by quantity

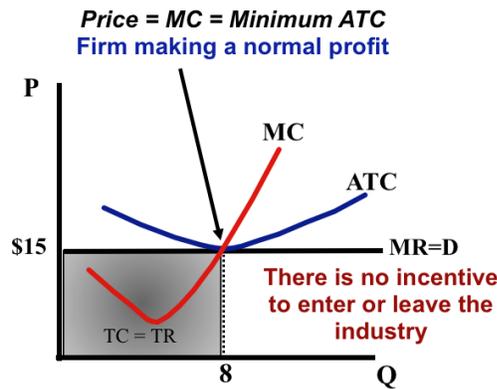$$\text{Average Total Cost} = \frac{\text{Total Costs}}{\text{Quantity}}$$

- A change in AV will always cause a change in MC
- Relationship between average and marginal costs
  - the MC curve intersects the ATC curve at its lowest point.
    - when the marginal cost is below the average, it pulls the average down.

- ■ when the marginal cost is above the average, it pulls the average up.
  - ○ average variable costs are increasing when marginal cost is higher than average variable cost

Profit
- Total Revenue: price of good times quantity
- Explicit Costs: payments paid by firms for using the resources of others
  - ○ Ex: Rent, Wages, Materials, Electricity Bills
- Implicit Costs: the opportunity costs that firms "pay" for using their own resources
  - ○ Ex: Forgone Wage, Forgone Rent, Time
- Accounting Profit: total revenue - total explicit costs
- Economic Profit: total revenue - total economic costs (implicit + explicit)
- Normal Profit: The opportunity cost of the entrepreneur's talents. AKA the firm is earning zero economic profit (this is what is economically efficient in the long
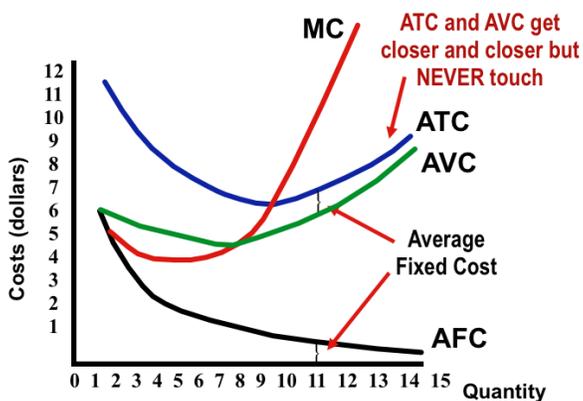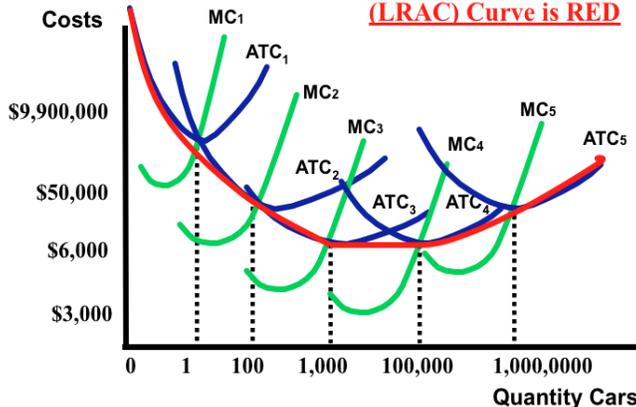
Firm in Long-Run Equilibrium

Price = MC = Minimum ATC
Firm making a normal profit

P

MC

ATC

$15 .... MR=D

There is no incentive
to enter or leave the
industry

TC = TR

8   Q

run)

Short Run and Long Run Cost Curves (absolutely need to understand these!)

Per-Unit Costs (Average and Marginal)

MC   ATC and AVC get
closer and closer but
NEVER touch

Costs (dollars)

12
11
10
9
8
7
6
5
4
3
2
1

ATC

AVC

Average
Fixed Cost

AFC

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15   Quantity

**Long Run Average Cost
(LRAC) Curve is RED**

Costs

MC_1

ATC_1

MC_2

MC_5

$9,900,000

MC_3

MC_4

ATC_5

ATC_2

$50,000

ATC_3 ATC_4

$6,000

$3,000

0   1   100   1,000   100,000   1,000,0000

Quantity Cars

Long Run Average Total Cost (LRATC) Curve
- Economies of Scale: when LRATC falls because mass production techniques are used; plant size rises - downward part of LRATC curve
- Constant Returns to Scale: when the LRATC is as low as it can get and LRATC is constant if a firm size increases, thus neither decreasing or increasing ATC
- Diseconomies of Scale: when LRATC increases as the firm gets too big and difficult to manage.

Long Run **AVERAGE** Total Cost
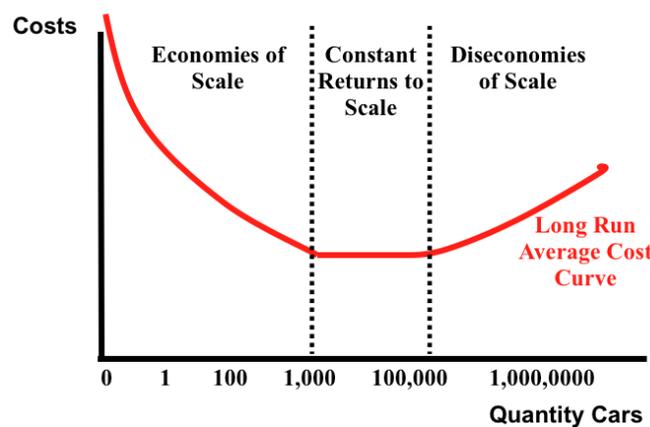
Allocative and Productive Efficiency
- Allocative Efficiency: Producers are allocating resources to make the products most wanted by society, thus, it is where MSB (measured by measured by price) = MSC (measured by marginal cost).
  - Price = MC
- Productive Efficiency: the production of a good in a least costly way so that minimal resources are being used. Also any point on the PPC/PPG/PPF.
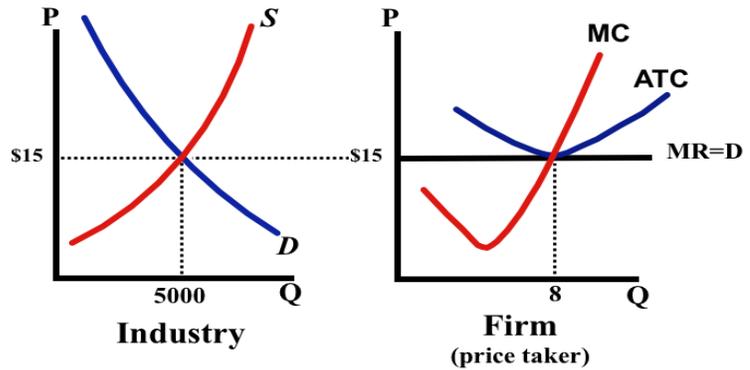 - Price = Minimum ATC

Perfect Competition
- Perfect Competition: when both buyers and sellers are price-takers, meaning that

neither has any influence over the price of a product.

Perfectly competitive market in long run equilibrium →

P | S | P | MC | ATC

$15 .... $15 | MR=D

D

5000 Q | 8 Q

Industry | **Firm** (price taker)

- MC = D = P
- allocative efficiency where P = MC
- productive efficiency where P = minimum ATC
- profits (or losses) are the product of the quantity and the difference between P and ATC
- zero long run economic profit:

Firm in Long-Run Equilibrium

Price = MC = Minimum ATC
Firm making a normal profit

P

MC

ATC

$15 MR=D

There is no incentive to enter or leave the industry

TC = TR

8 Q