

CMP

COMMERCE MENTORSHIP PROGRAM

FINAL REVIEW SESSION

ECON 101

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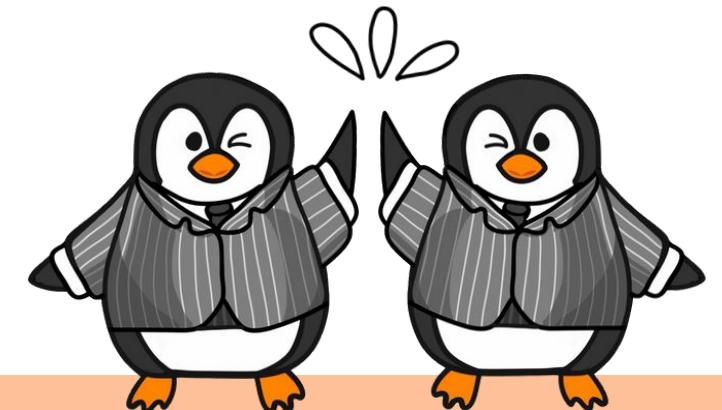


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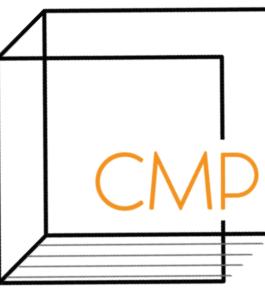
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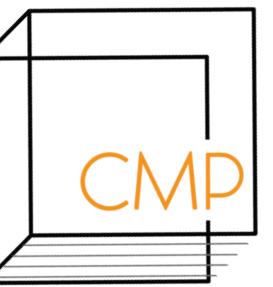
Part 3:

- What is Economics
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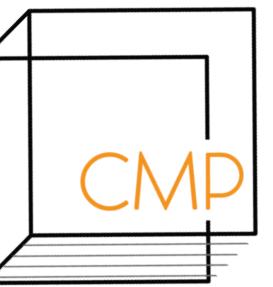




1. Externalities

- **externality:** cost/ benefit that results from production/ consumption that affects someone other than the producer/ consumer
- 4 types:
 1. **Negative production externality**
 - eg. air pollution from factories
 2. **Positive production externality**
 - eg. putting a bee farm and a garden side by side
 3. **Negative consumption externality**
 - eg. smoking
 4. **Positive consumption externality**
 - eg. getting the flu shot protects you and others





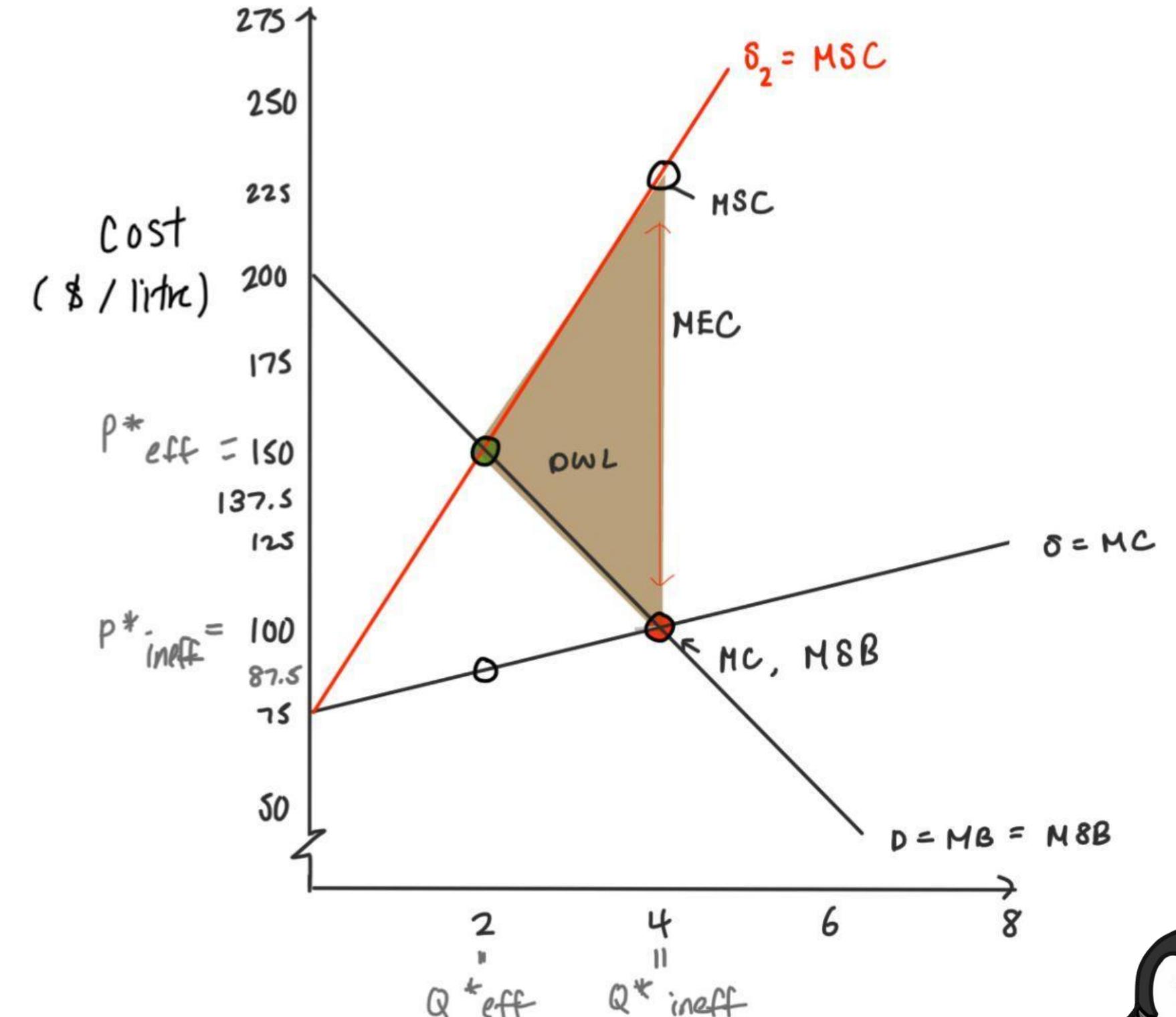
1. Externalities - Negative Production Externality

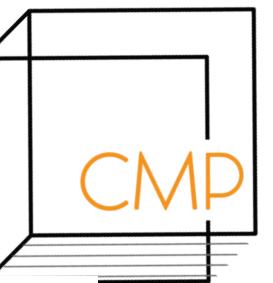
- **private cost (of production)**: cost that the producer themself bears
 - **marginal private cost (MC)**: private cost of producing 1 more unit
- **external cost (of production)**: cost that everyone else bears
 - **marginal external cost (MEC)**: external cost of producing 1 more unit
- **marginal social cost (of production)**: cost that everyone (both the producer & everyone else) bears
 - $\text{MSC} = \text{MC} + \text{MEC}$
 - increases with output



1. Externalities - Negative Production Externality

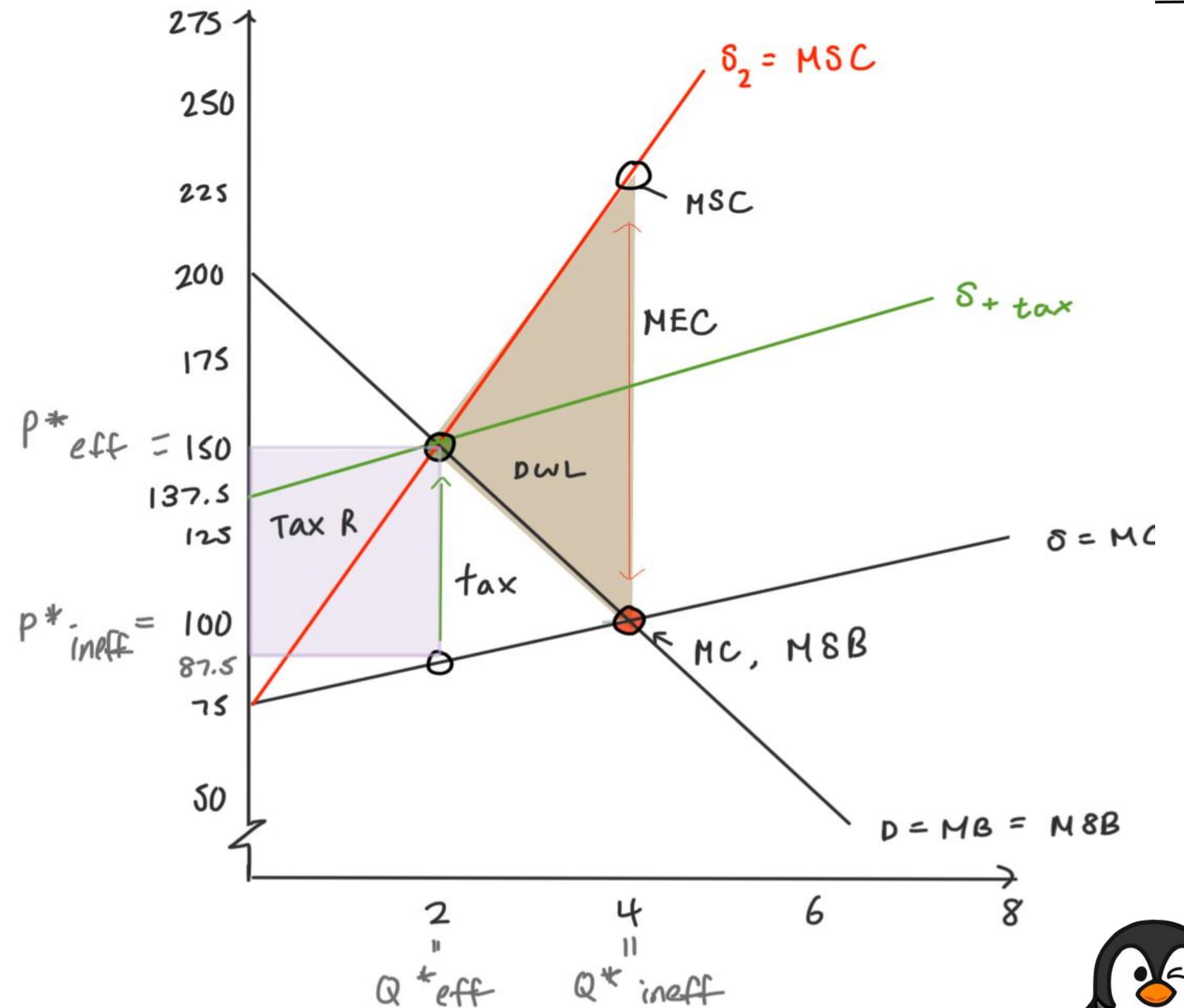
- Eg. Factories that produce paint contributes to pollution
 - when 4 million litres of paint are produced per month, it costs the producer \$100/litre
 - But the “actual” total cost is \$225/litre because each litre is causing \$115 worth of pollution/ litre
 - $MSC > MSB \rightarrow$ **overproducing** $\rightarrow DWL$
 - Efficient EQM** is where $MSC = MSB$

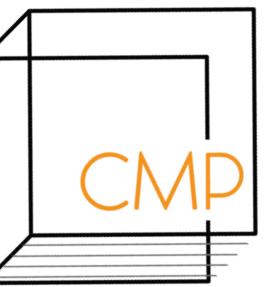




1. Externalities - Taxes

- Eg. Factories that produce paint contributes to pollution
- government forces market to the **efficient Q^*** by imposing **taxes**
 - tax amount = MSC – MC = MEC at the **efficient Q^***
 - $S \rightarrow S + \text{tax}$
 - raises MC up to equal MSC at the **efficient Q^***





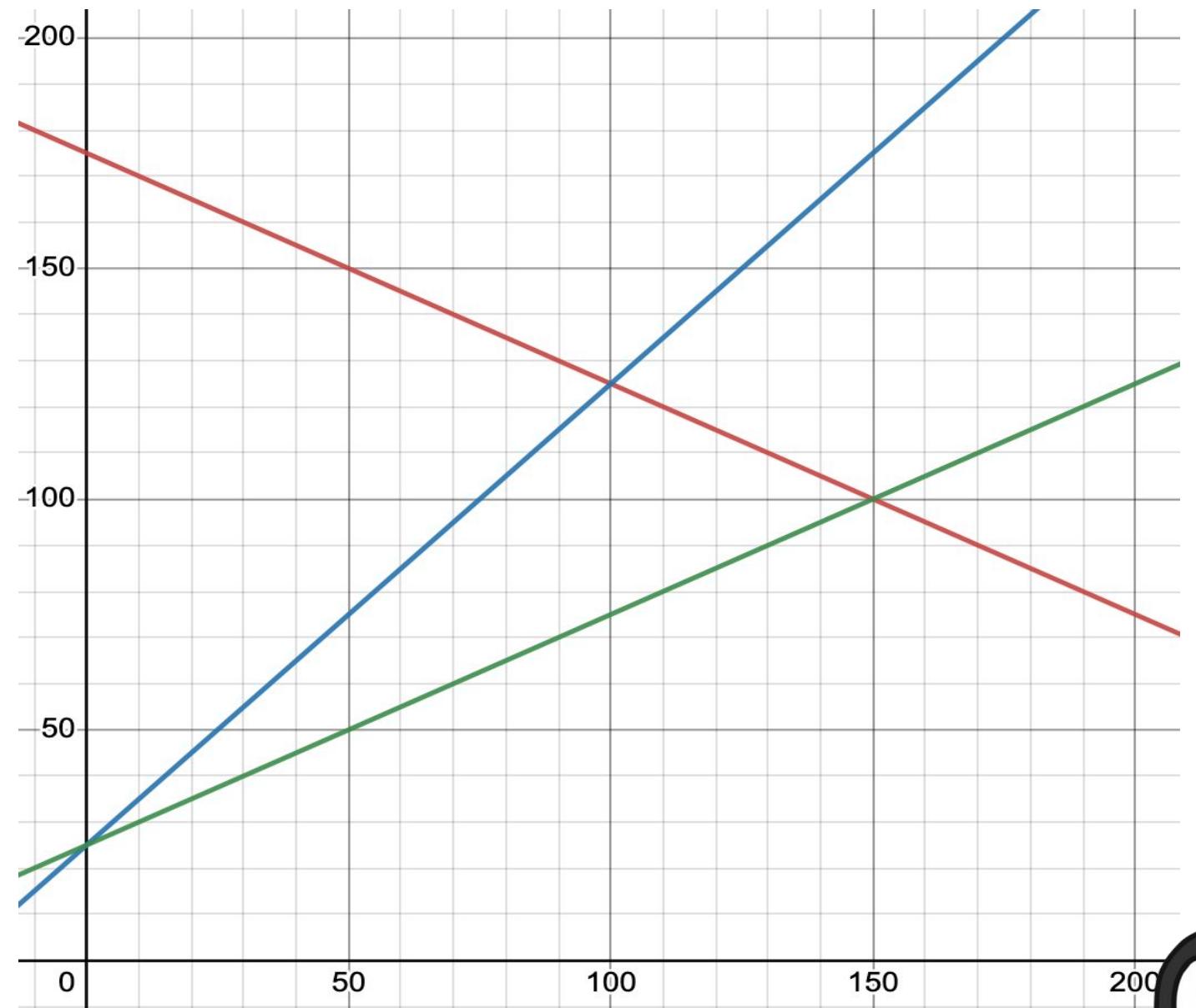
1. Externalities - Negative Production Externality

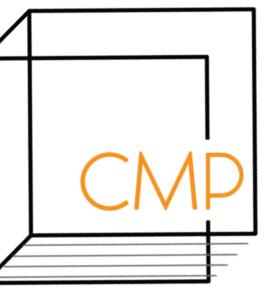
Q: CMP Airport is located in the centre of the residential area and the planes produce noise pollution for those who live nearby.

The market has the following demand and supply functions:

- $MSB = MB = 175 - 0.5Q$
- $MSC = 25 + Q$
- $MC = 25 + 0.5Q$

- a. Calculate the DWL
- b. How much taxes should be imposed on each flight to achieve EQM and what's the government's tax revenue?

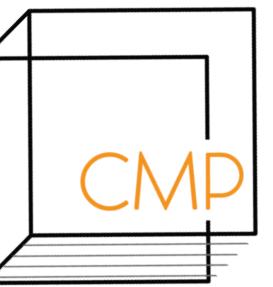




1. Externalities - Positive Consumption Externality

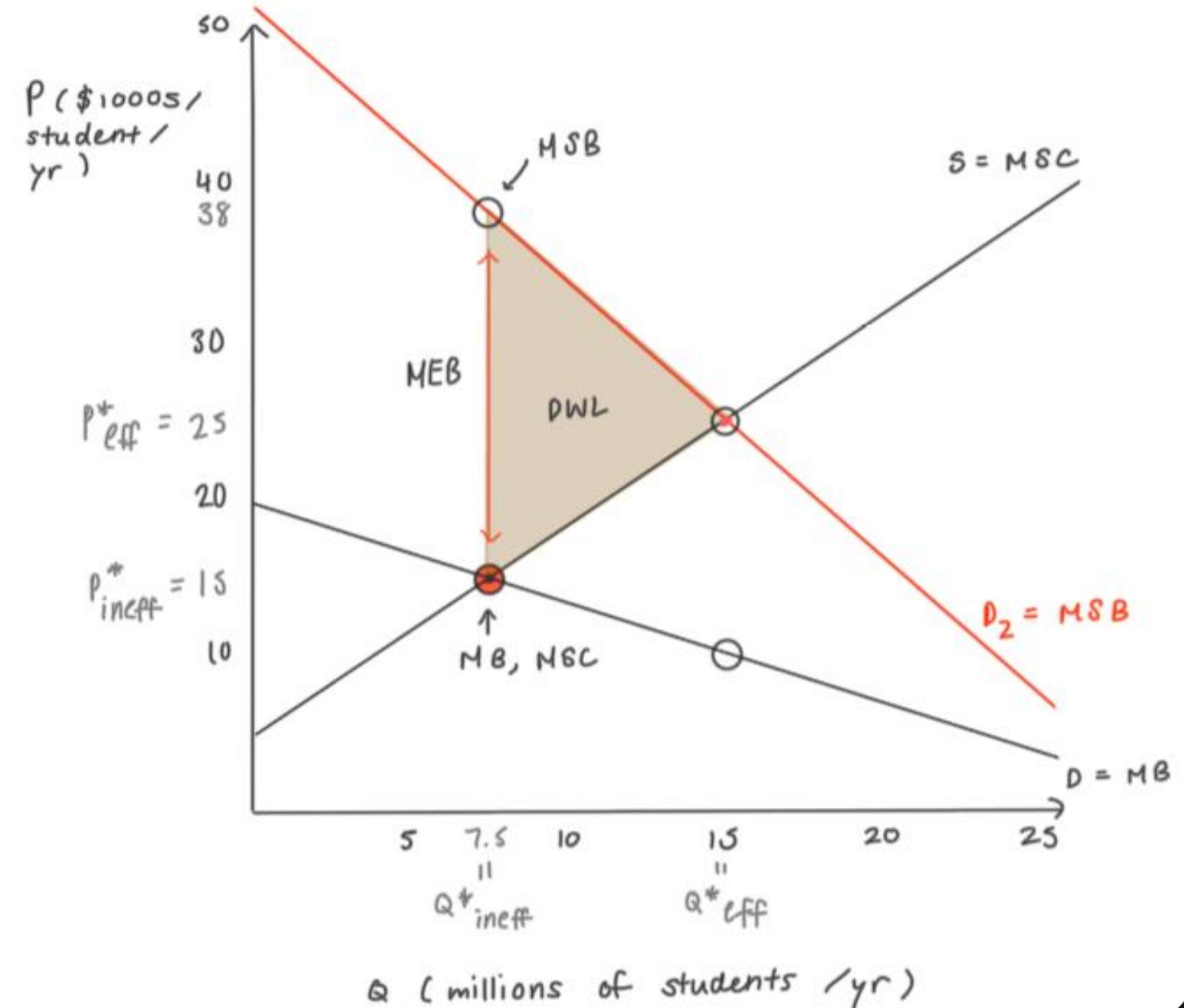
- **private benefit (of consumption):** benefit that the consumer receives
 - **marginal private benefit (MB):** private benefit of consuming 1 more unit
- **external benefit (of consumption):** benefit that everyone else receives
 - **marginal external benefit (MEB):** external benefit of consuming 1 more unit
- **marginal social benefit (of consumption):** benefit that everyone (both the consumer & everyone else) receives
 - $MSB = MB + MEB$
 - increases with output

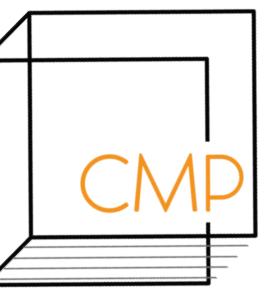




1. Externalities - Positive Consumption Externality

- Eg. Consider the UBC tuition market
 - when 7.5 million of students are studying at UBC per year, MB is \$15000/ student per year
 - But the “actual” total benefit is \$38000/ student per year because each student is generating \$23000 worth of external benefit
 - $MSB > MSC \rightarrow$ **underproducing** $\rightarrow DWL$
 - **Efficient EQM** is where $MSC = MSB$

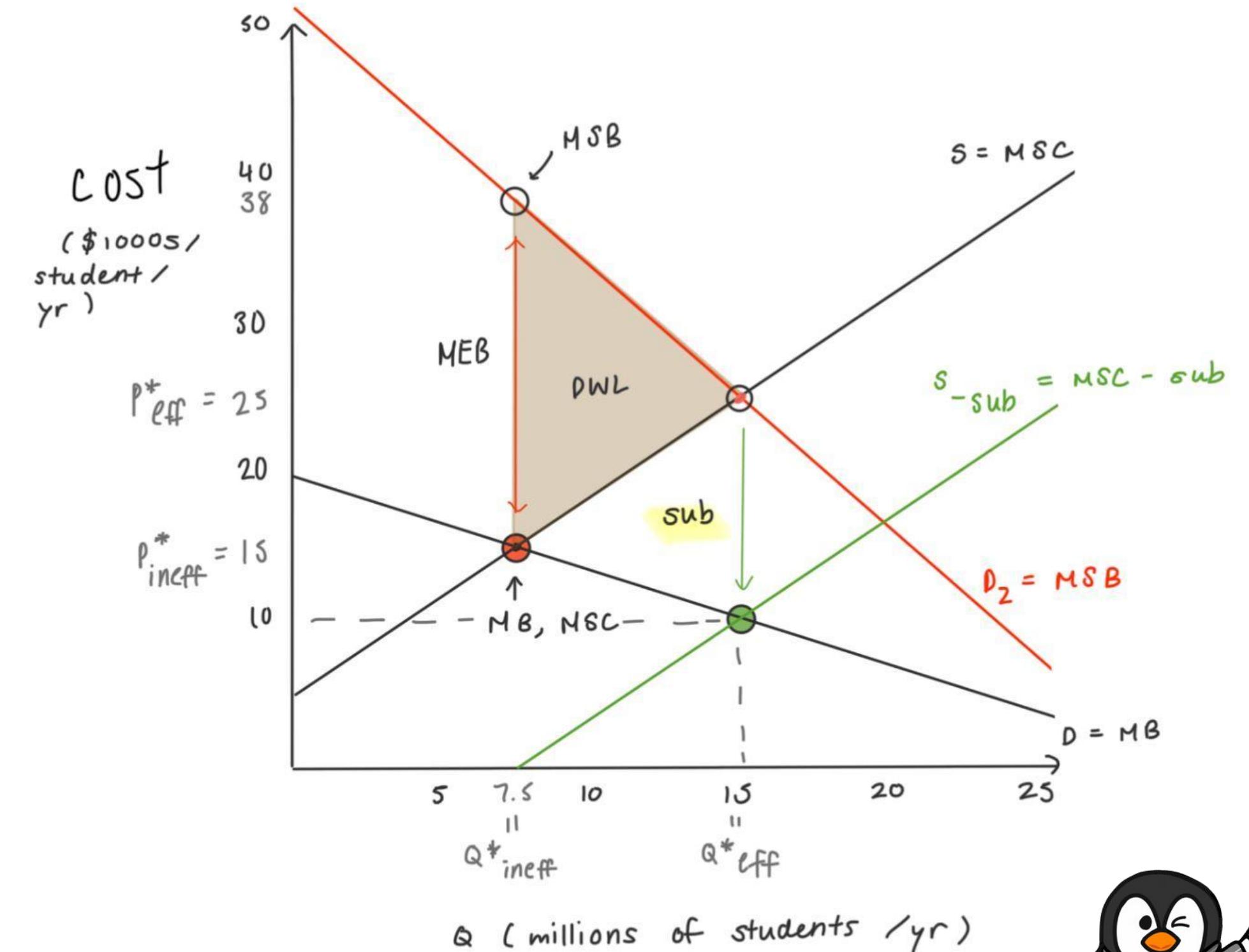


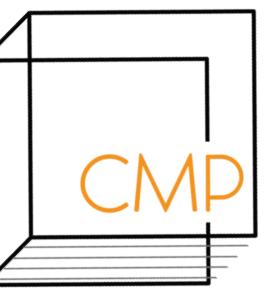


1. Externalities - Subsidy

- Eg. Consider the UBC tuition market
- government forces market to the **efficient Q^*** by imposing a **subsidy**
 - subsidy = MSB – MB = MEB at the **efficient Q^***
 - $S \rightarrow S\text{-subsidy}$
 - lowers MSC to equal MB at the **efficient Q^***

government pays UBC \$15000/ student → UBC can charge students \$15000 less → supply increases → more students can go to UBC > reach the **efficient Q^***

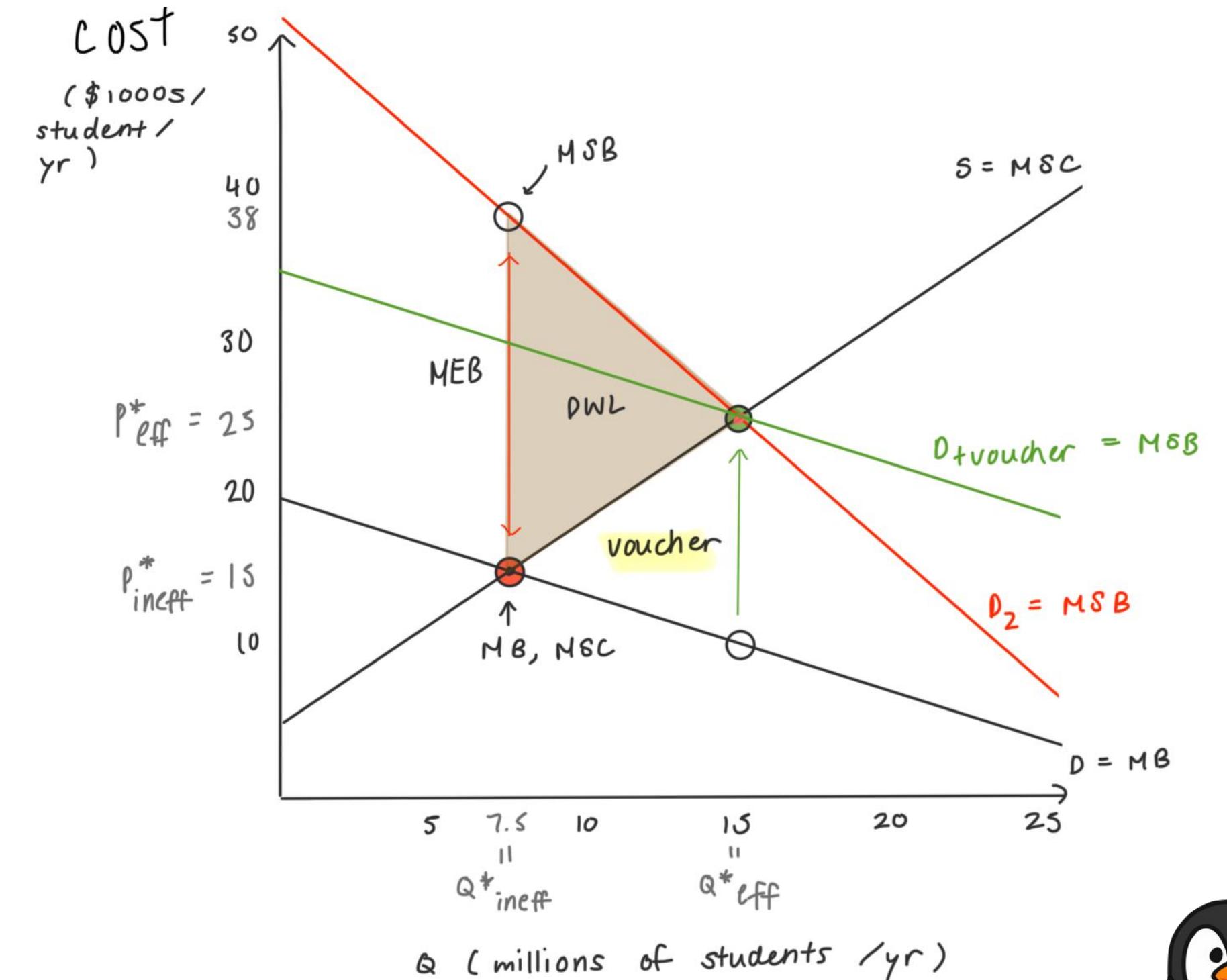


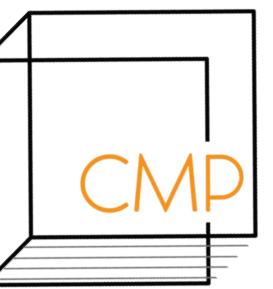


1. Externalities - Vouchers

- Eg. Consider the UBC tuition market
- government forces market to the **efficient Q^*** by offering **vouchers**
 - voucher = $MSB - MB = MEB$ at the **efficient Q^***
 - $S \rightarrow D + \text{voucher}$
 - raises MSB to equal MSC at the **efficient Q^***

government gives each student \$15000 worth of vouchers → it's cheaper to go to UBC now → demand increases → more students will go to UBC → at the **efficient Q^***



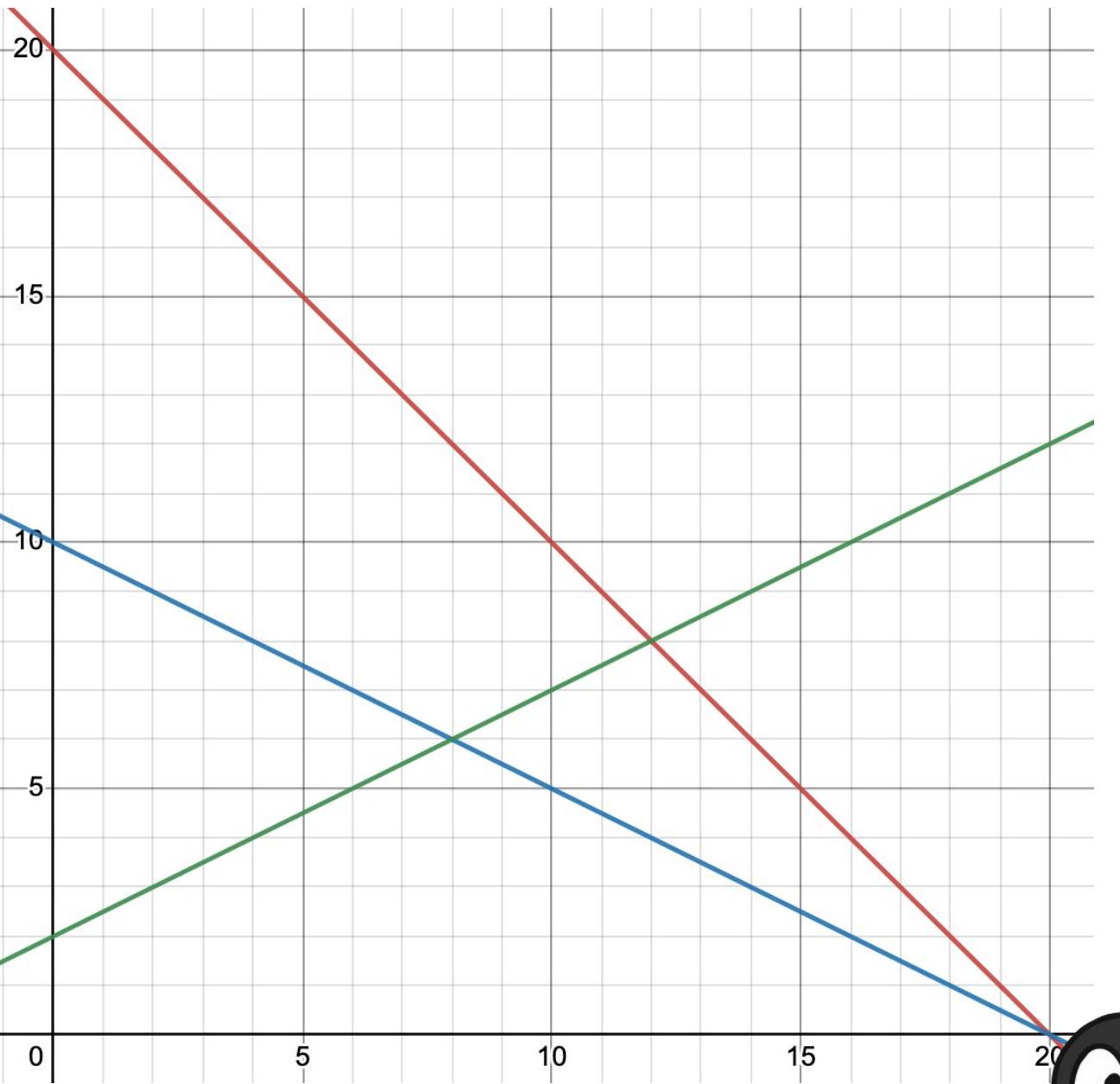


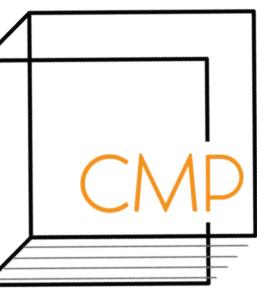
1. Externalities - Positive Production Externality

Q: Every time a person gets a flu shot, they are protecting not just themselves, but also everyone else. The flu shot market has the following demand and supply functions (assume flu shots aren't free):

- $MSB = 20 - Q$
- $MB = 10 - 0.5Q$
- $MC = 2 + 0.5Q$

- a. Calculate the DWL.
- b. What should the subsidy or voucher amount be to achieve EQM and how much would the government have to spend on those?

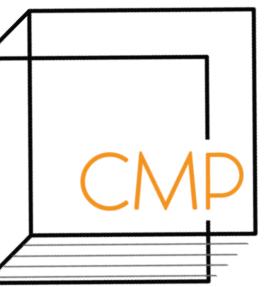




2. Perfect Competition

- **Perfect competition:** market where,
 1. many buyers & many sellers that sell identical products
 2. no restrictions to enter the industry
 3. established firms have NO advantage over new firms
 4. sellers & buyers are well-informed about the market price
- every firm in perfect competition is a **price taker:** they can't influence the price
- every firm's products are identical → perfect substitutes → demand for each firm's products is perfectly elastic



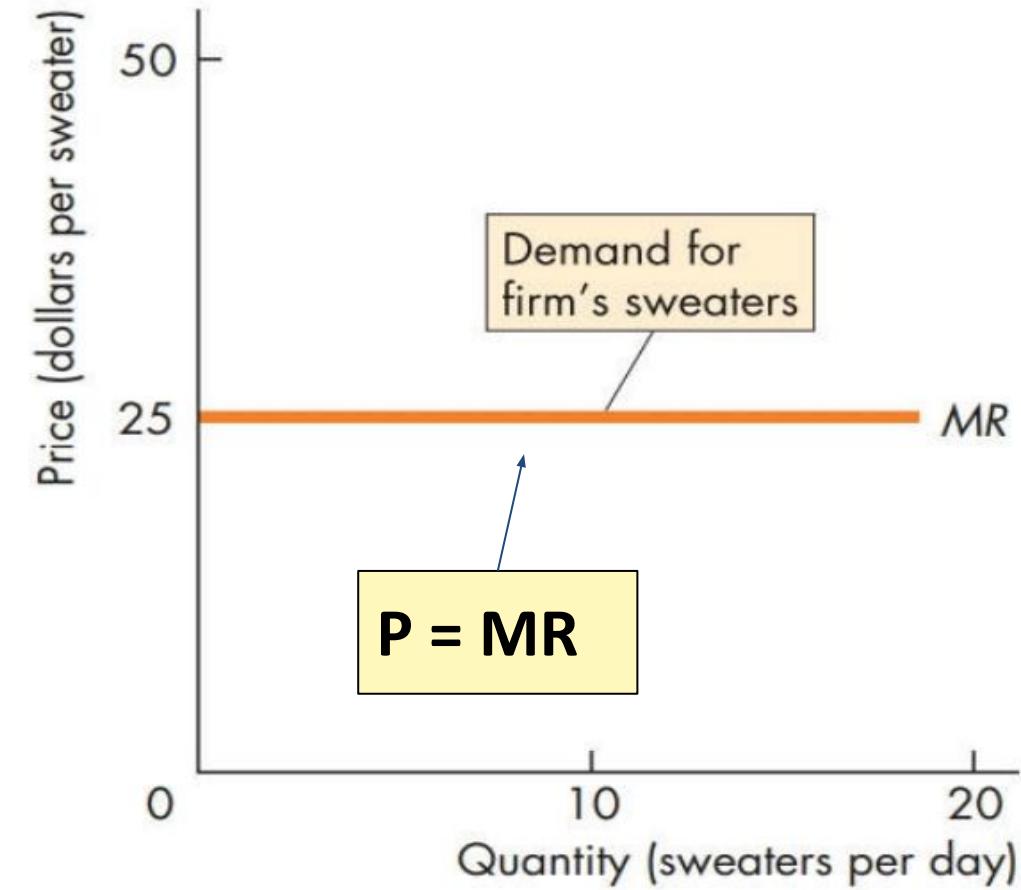
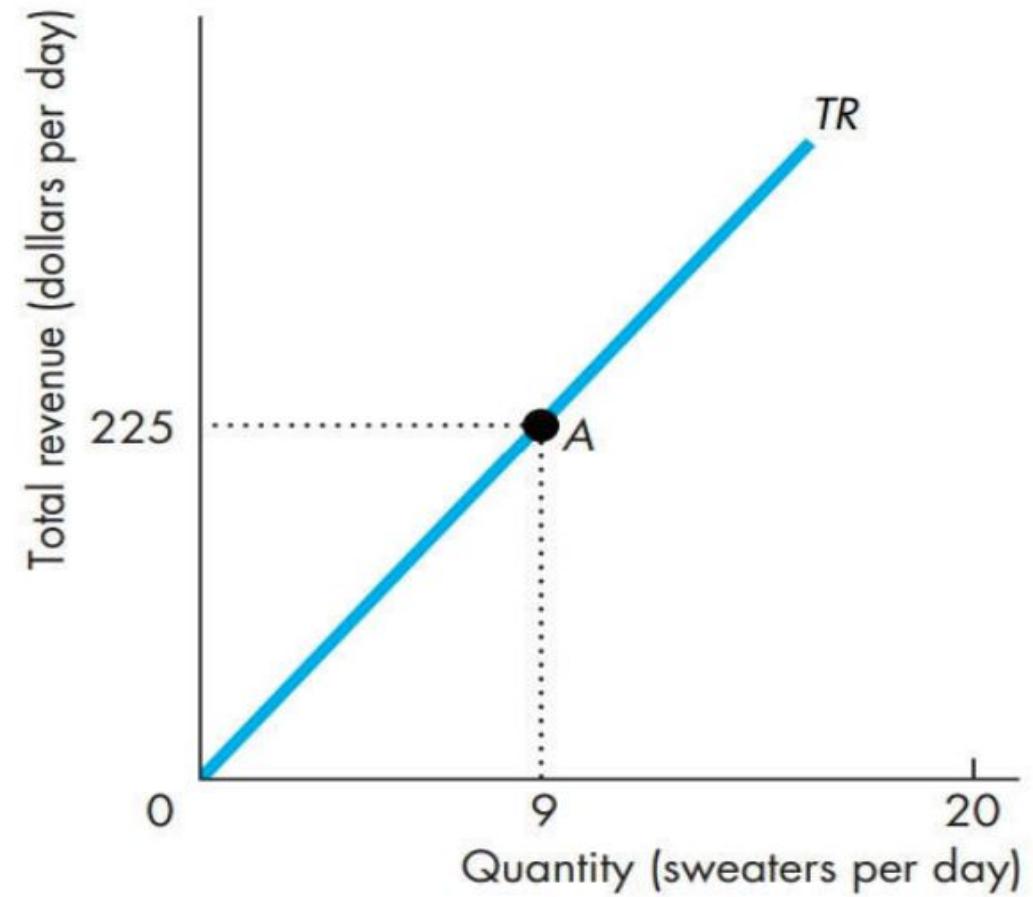
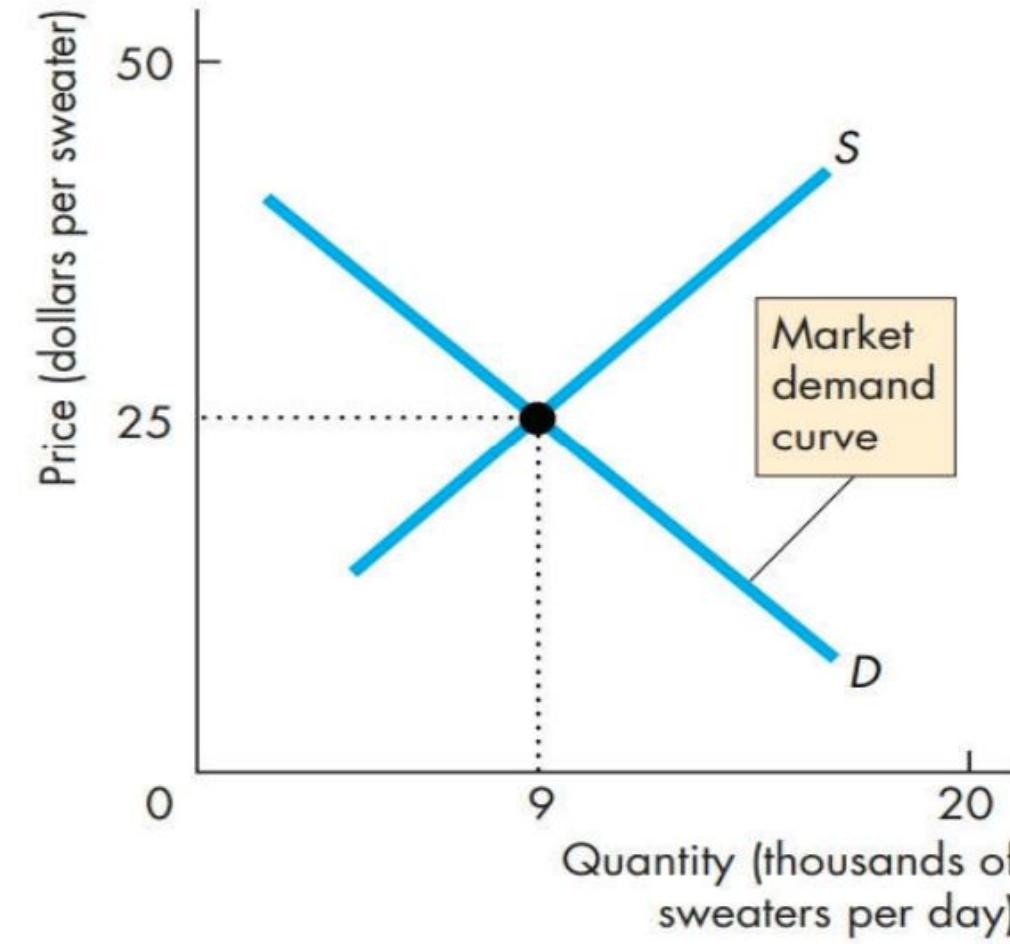
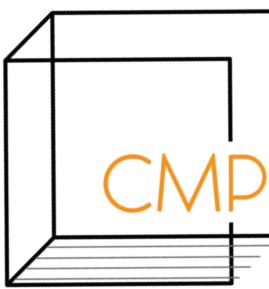


2. Perfect Competition

- like any other firm, the goal is to maximize profit
 - **total cost (TC)**: all of the firm's costs, the opportunity cost (OC) of production
 - **total revenue (TR)** = Price (P) x Quantity (Q)
 - **marginal revenue (MR)**: change in Total Revenue when the Quantity Sold increases by 1, also the derivative of the Total Revenue function
 - in perfect competition, a firm's MR equals the market price
 - $P = MR$



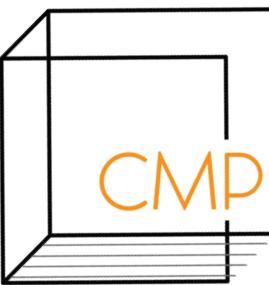
2. Perfect Competition



NOTE!

- Demand for the firm's products are perfectly elastic because 1 firm's sweater is a perfect substitute for another firm's sweaters
- BUT market demand isn't perfectly elastic because its elasticity depends on the substitutability of sweaters for other goods & services

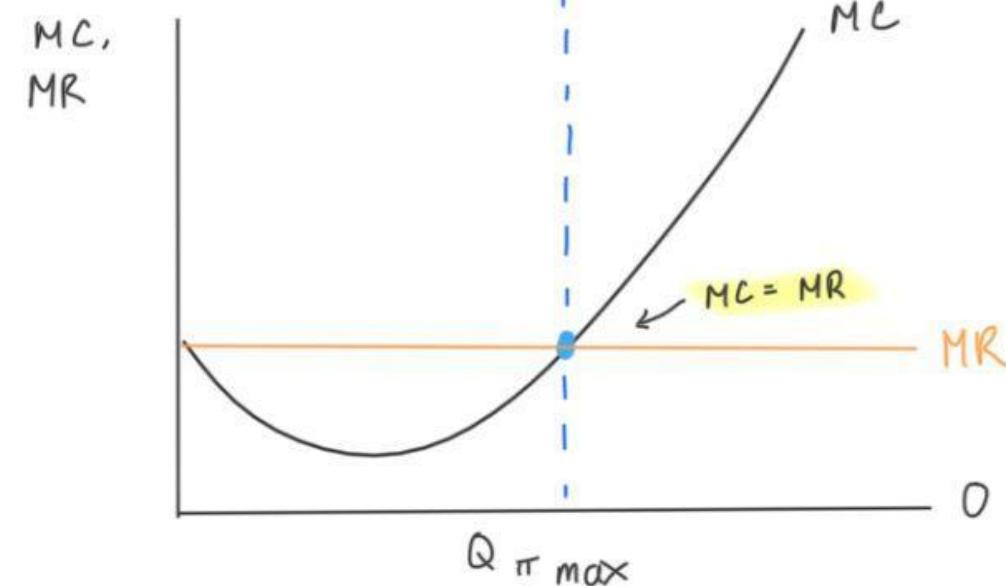
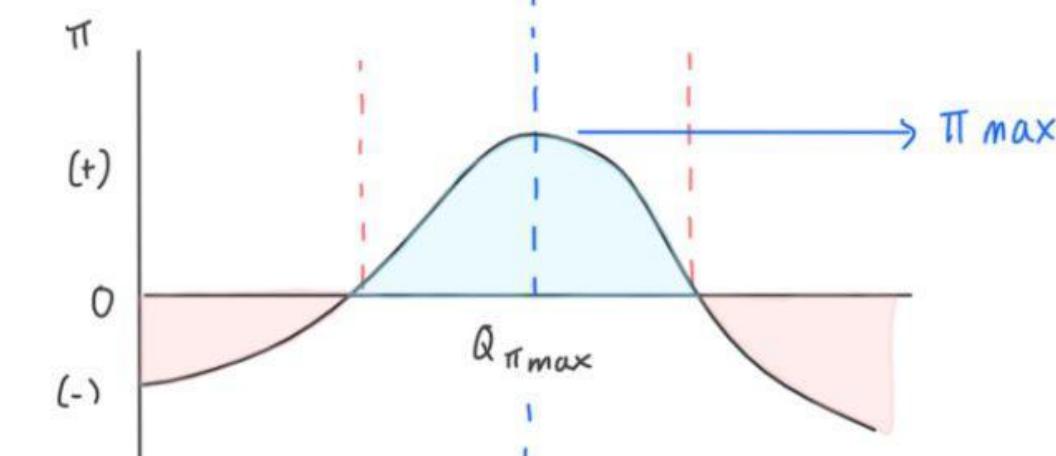
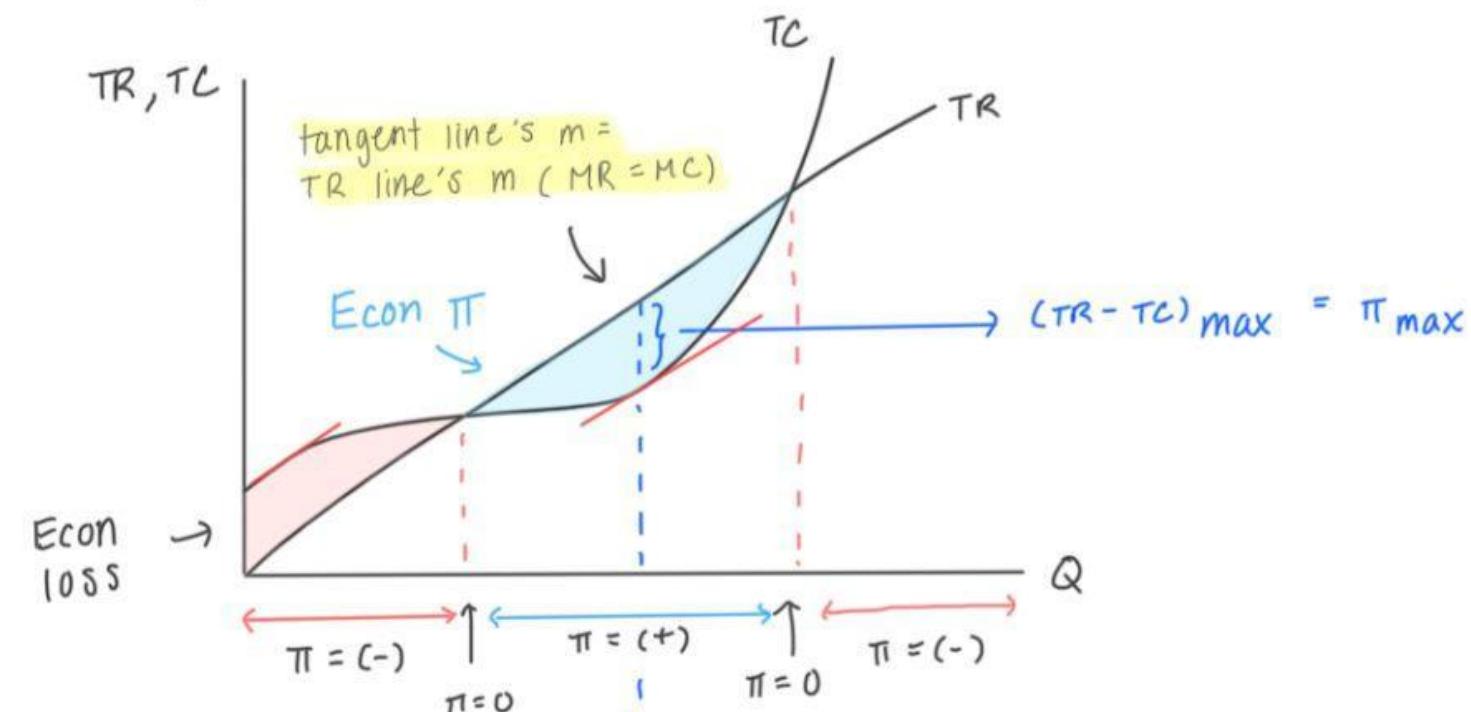


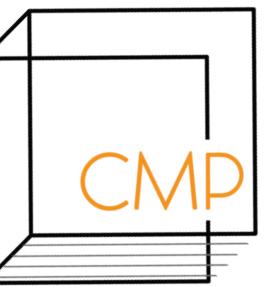


2. Perfect Competition - Profit Maximizing Output

- more specifically, a firm's goal is to maximize profit under constraints, but to do that, we must determine:
 - How to produce at minimum cost
 - How much to produce in order to maximize profit
(profit maximizing output: output that maximizes economic profit)
 - When to enter or exit the market

Q (π max) is when $P = MR = MC$



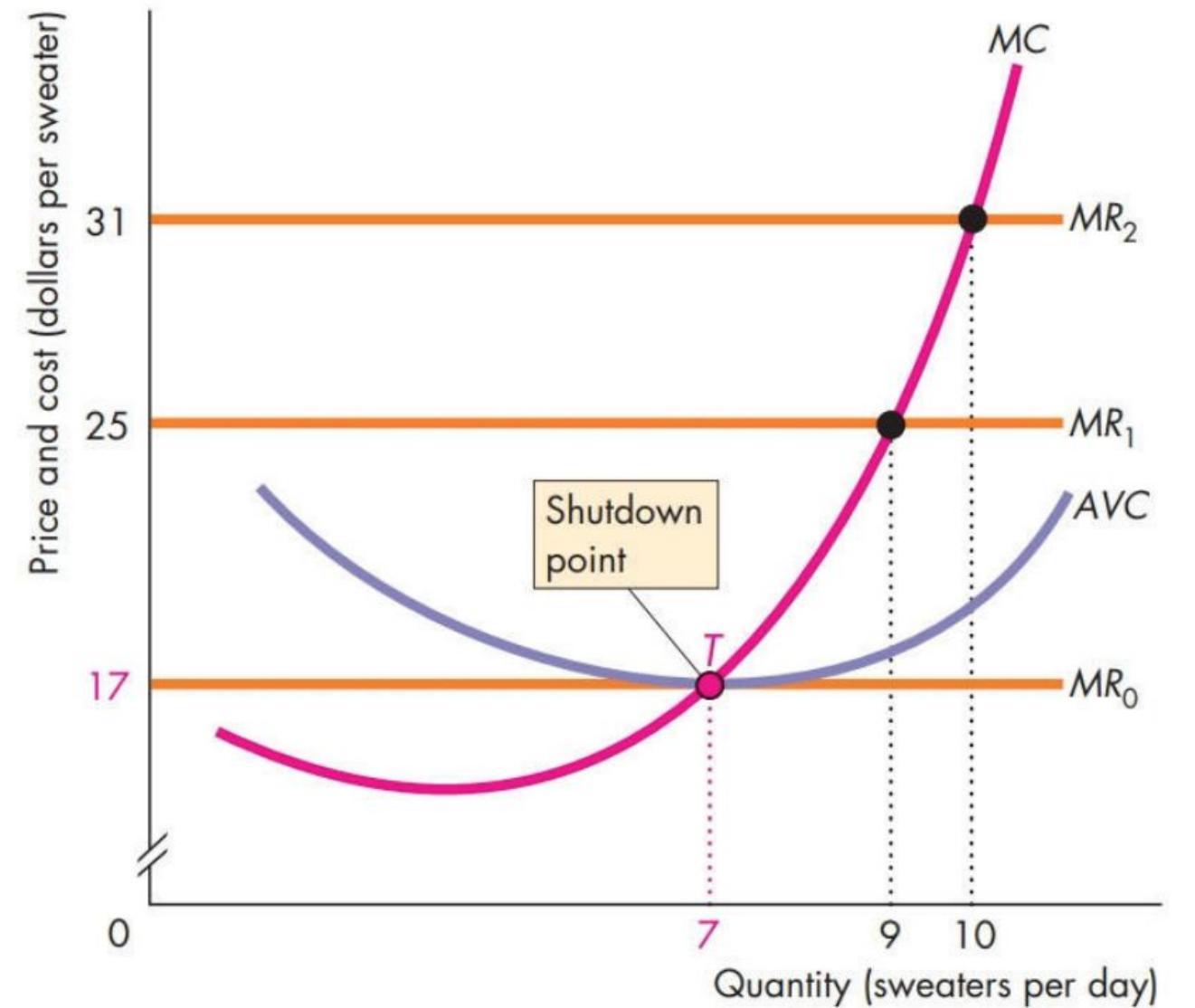


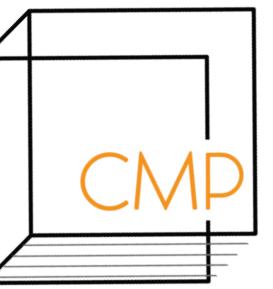
2. Perfect Competition - Temporary Shut Down (SD) Point

- when a firm has a loss, they can stay or leave the market
- if they stay, they can either produce or temporarily shutdown
 - compare P with AVC min
- if $P > AVC \text{ min} \rightarrow \text{produce}$
- if $P < AVC \text{ min} \rightarrow \text{shutdown}$
- if $P = AVC \text{ min} \rightarrow \text{shutdown (SD) point}$
 - TR only covers TVC, so the only loss is TVC which is the same as shutting down

NOTE!

- AVC min is when MC intersects AVC





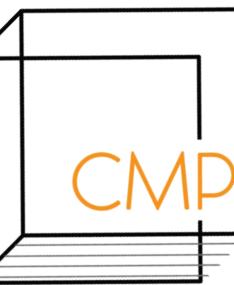
2. Perfect Competition

Q: James is an apple farmer in a perfectly competitive market. His farm has an ATC min of \$4 and an AVC min of \$1.50. In the short run, if the price for apples is \$2:

- a) He would exit the market.
- b) He would stay in the market and produce.
- c) He would stay in the market but his firm would temporarily shut down.
- d) None of the above



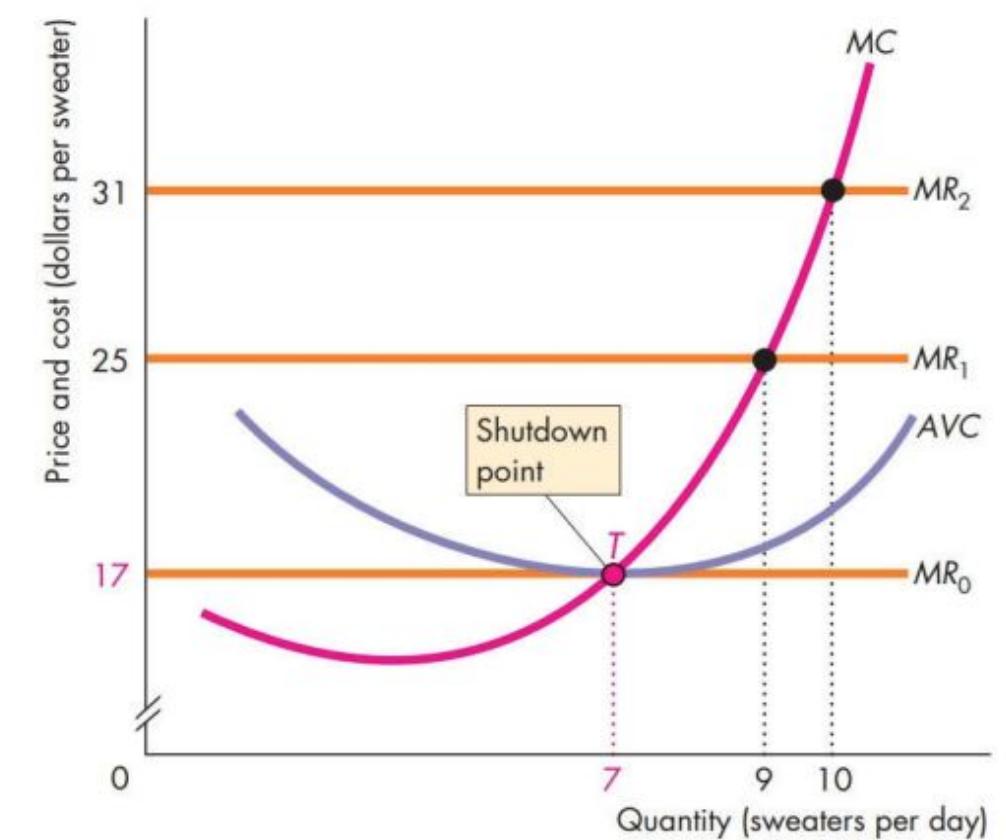
2. Perfect Competition - Firm's Supply Curve



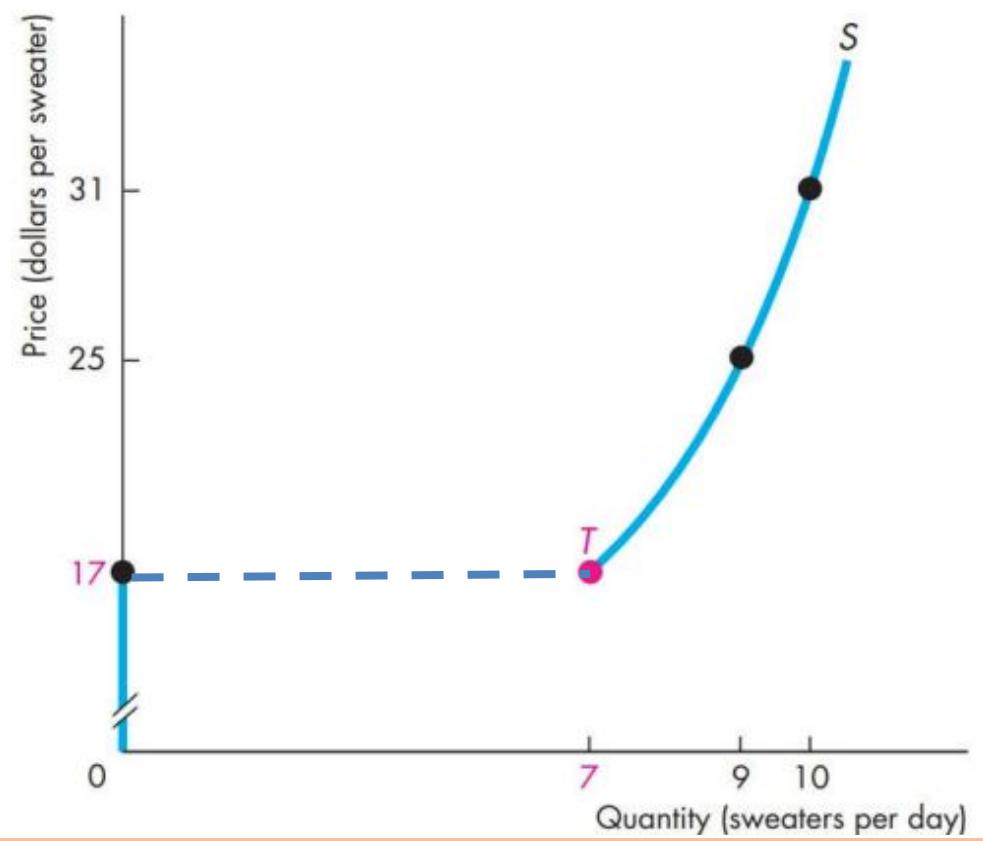
- if $P < SD$ point \rightarrow shut down
- if $P < SD$ point \rightarrow produce along the MC curve because profit maximizing quantity is when $MC = MR$
- if $P = SD$ point \rightarrow indifferent about shutting down and producing

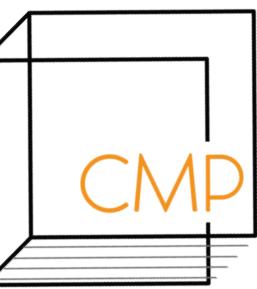
NOTE!

- firm never produces a quantity between 0 and 7 in this example



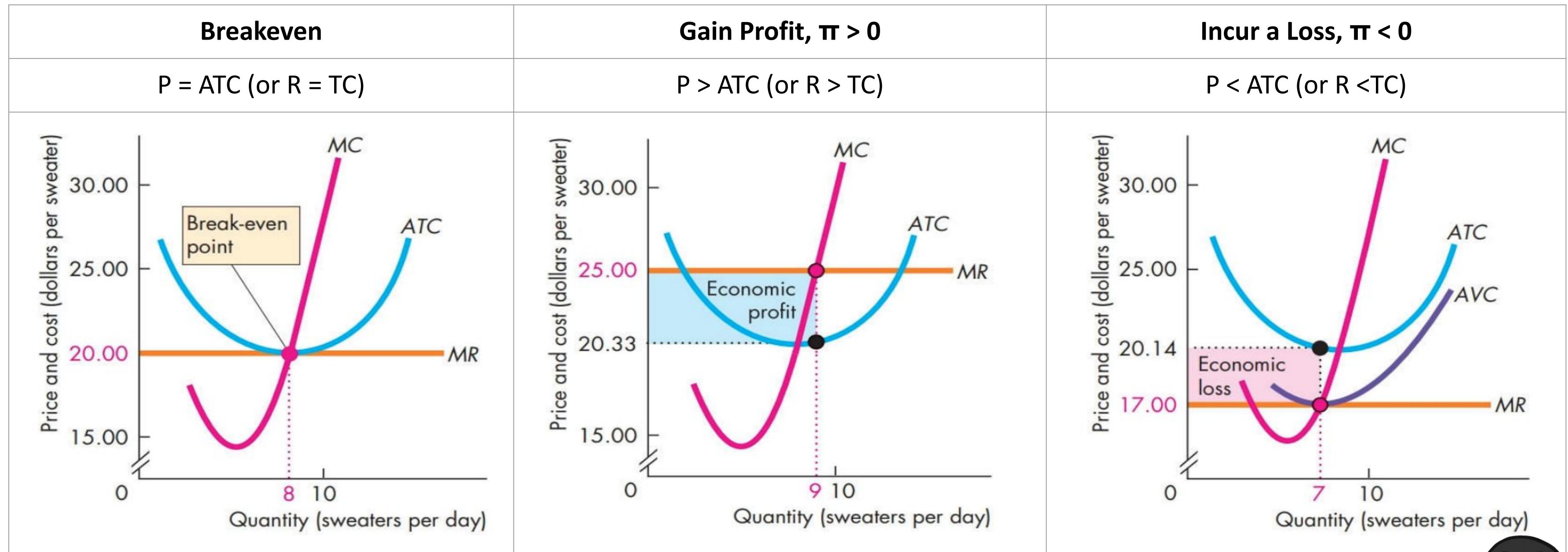
(a) Marginal cost and average variable cost

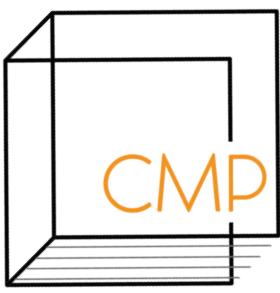




2. Perfect Competition - Short Run

- 3 scenarios in the short run:

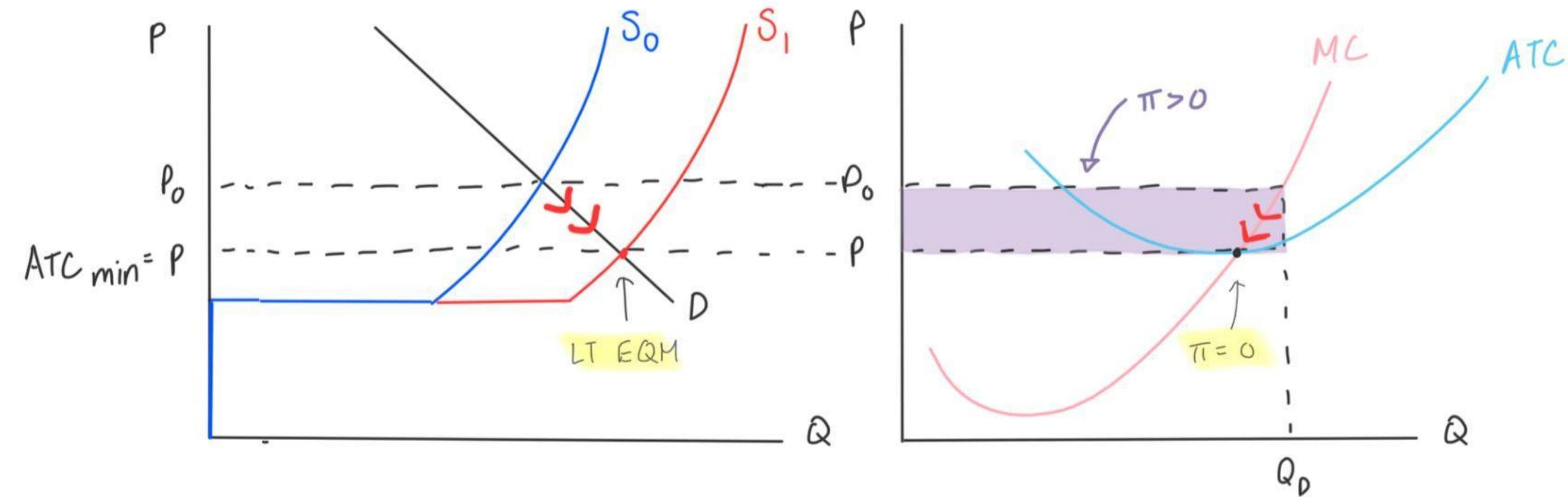




2. Perfect Competition - Long Run

- Entry

- market $P >$ firm's ATC min \rightarrow firm's $\pi > 0 \rightarrow$ new firms enter the market \rightarrow market S will increase \rightarrow market P will decrease \rightarrow existing firm's Q decreases
- it will continue until $P = \text{ATC min}$ and the firm's $\pi = 0$
- BUT the overall market sells more because there are more firms producing Q^*

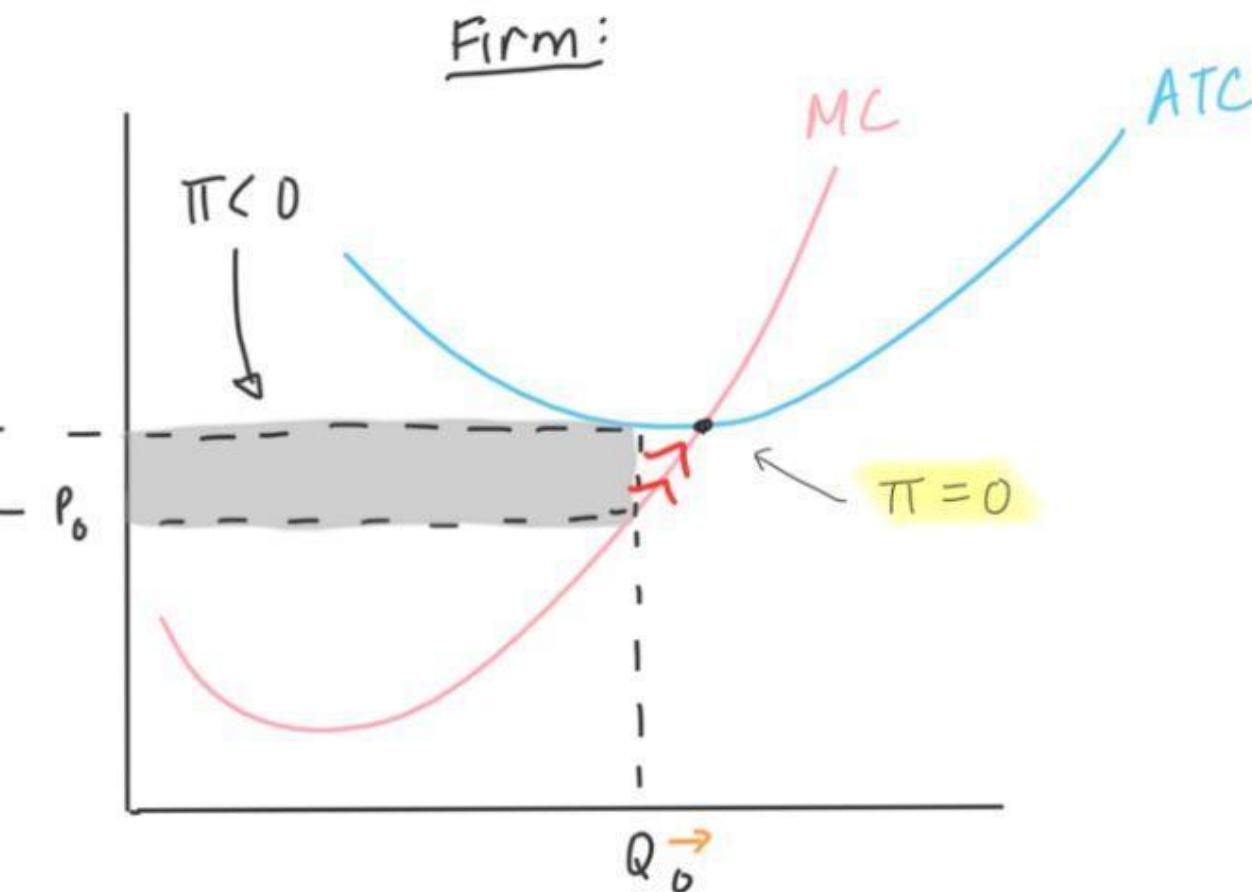
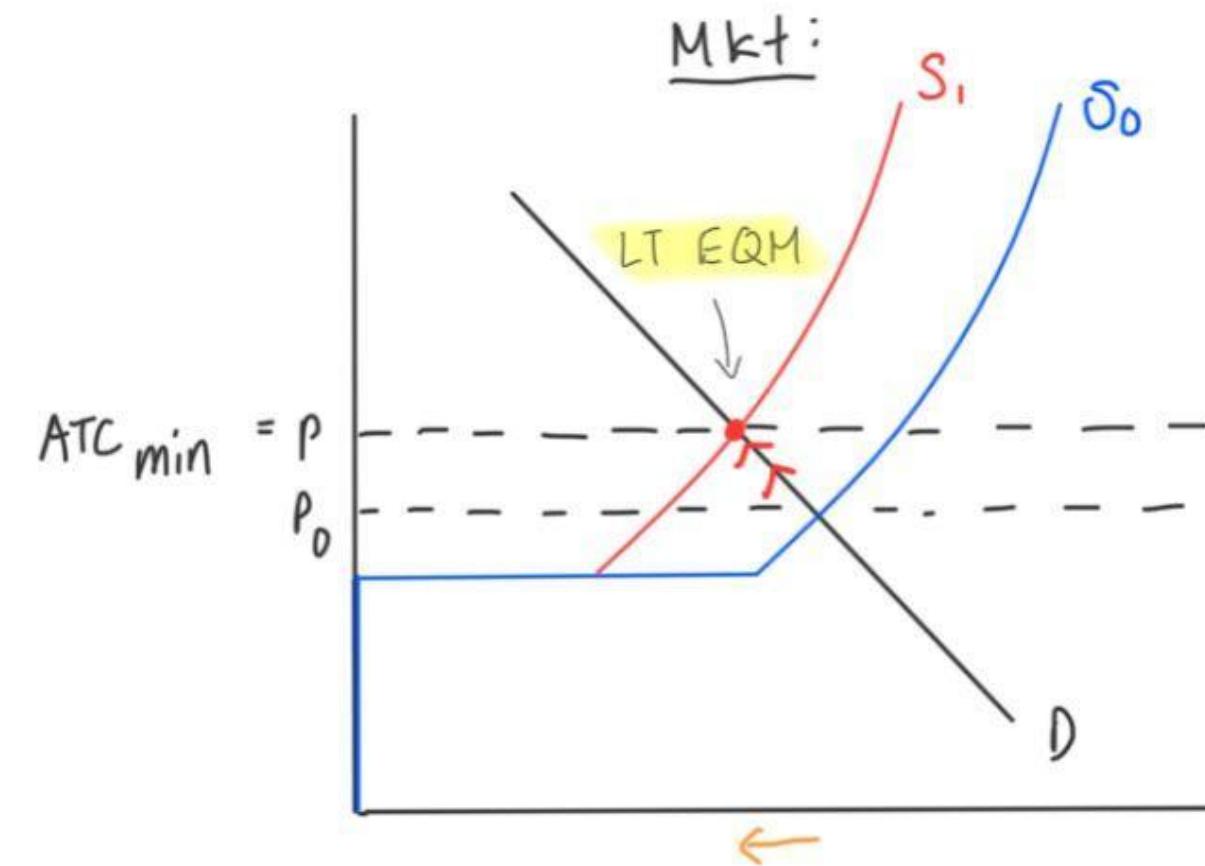


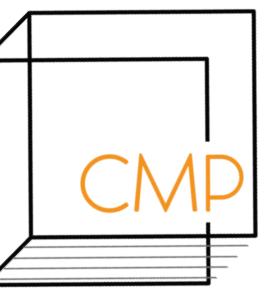
2. Perfect Competition - Long Run

Long run EQM is breakeven, $\pi = 0$

- Exit

- market $P <$ firm's ATC min \rightarrow firm's $\pi < 0 \rightarrow$ firms exit the market \rightarrow market S will decrease \rightarrow market P will increase \rightarrow firms no longer make a loss \rightarrow existing firm's Q increases
- it will continue until $P = \text{ATC min}$ and the firm's $\pi = 0$
- BUT the overall market sells less because there are less firms producing Q^*



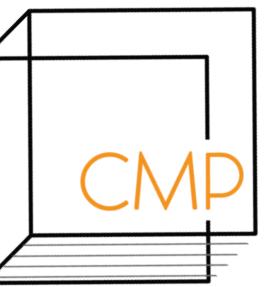


3. Perfect Competition

Q: In the short run, firms in the fabric market are making a loss where $P < ATC \text{ min}$. Which of the following describes what will happen in the long run?

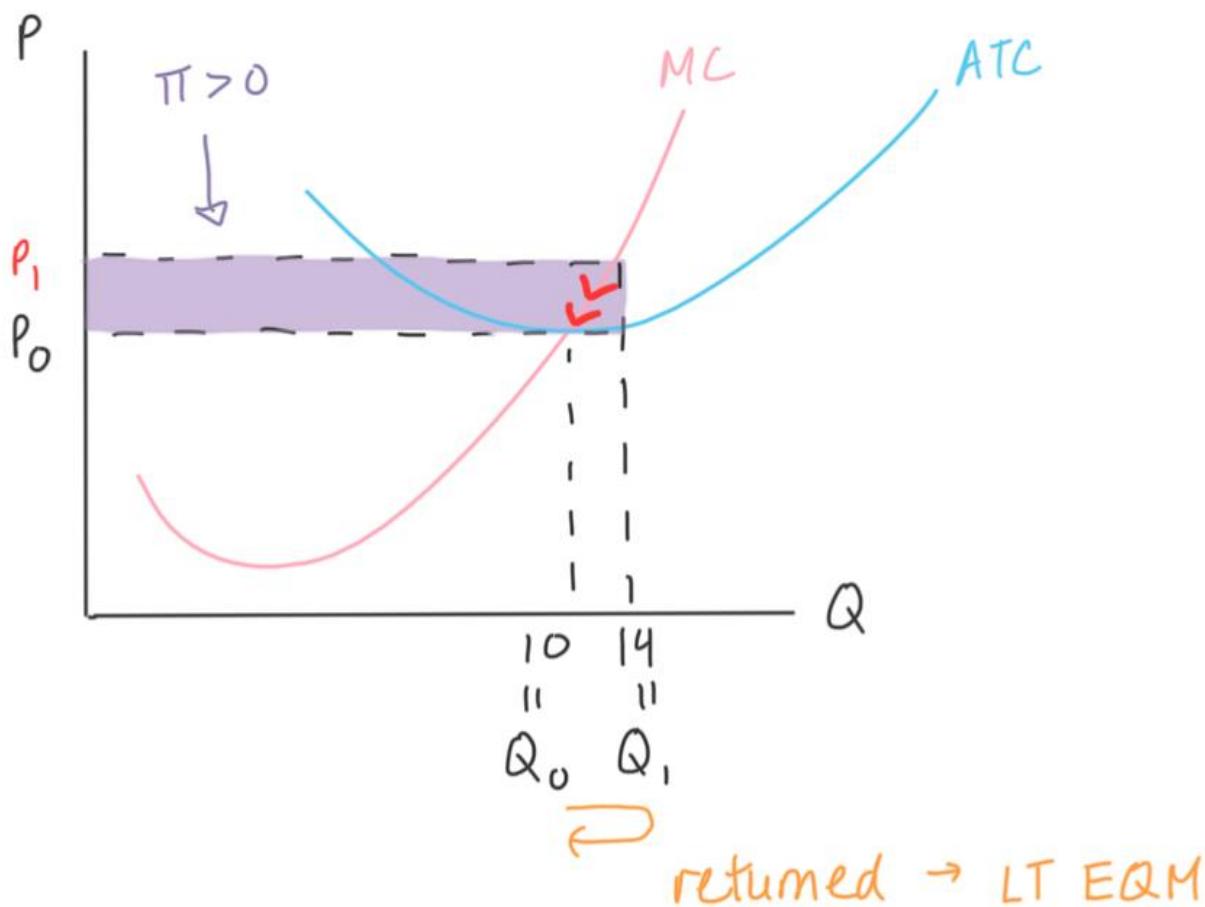
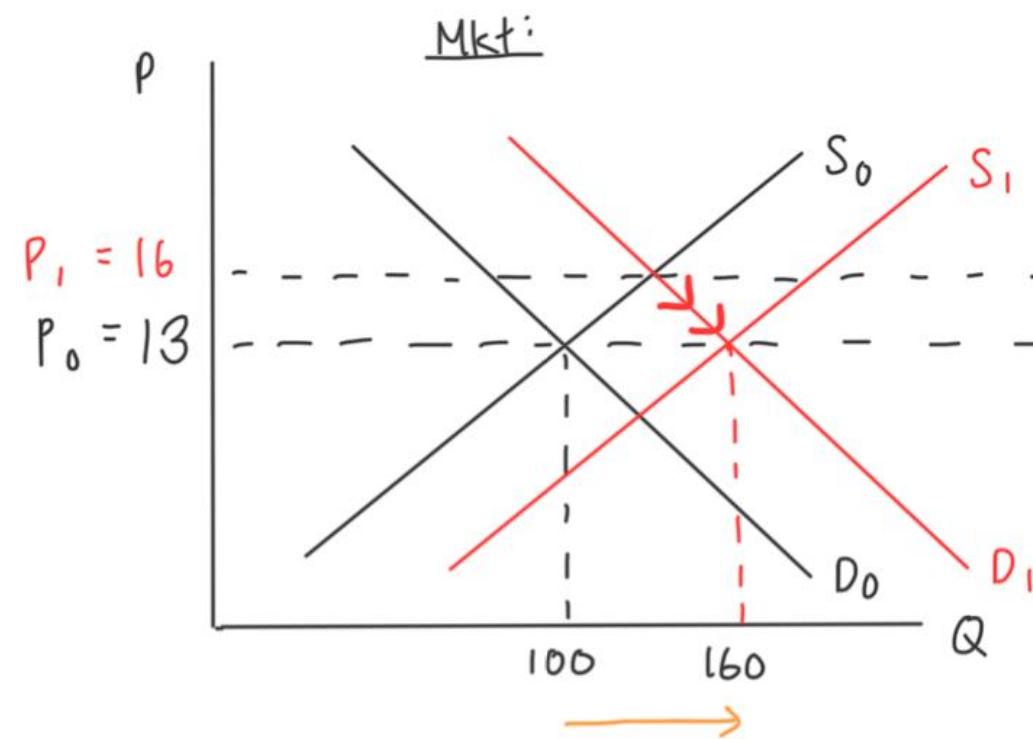
- a) firms will enter the market → market supply increases → market price decreases → firms break even
- b) firms will exit the market → market supply decreases → market price increases → firms break even
- c) firms will temporarily shut down → market supply decreases → market price increases → firms start producing again
- d) None of the above





2. Perfect Competition - Permanent Change in Demand

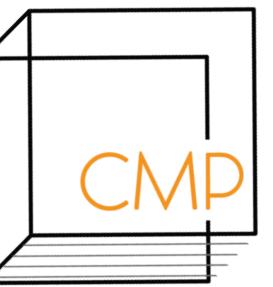
- Demand increases
 - originally at long run EQM → demand curve shifts right → P increases, $P >$ firm's ATC min, $\pi > 0$ → existing firms produce more, firms enter market → market S increases → market P decreases → each firm produces less
 - Continue until $P = \text{ATC min}$ and the firm's $\pi = 0$
 - Result: more firms produce the equilibrium Q because firms entered



Before: each firm produces 10 units & 100 units are produced in total → 10 firms

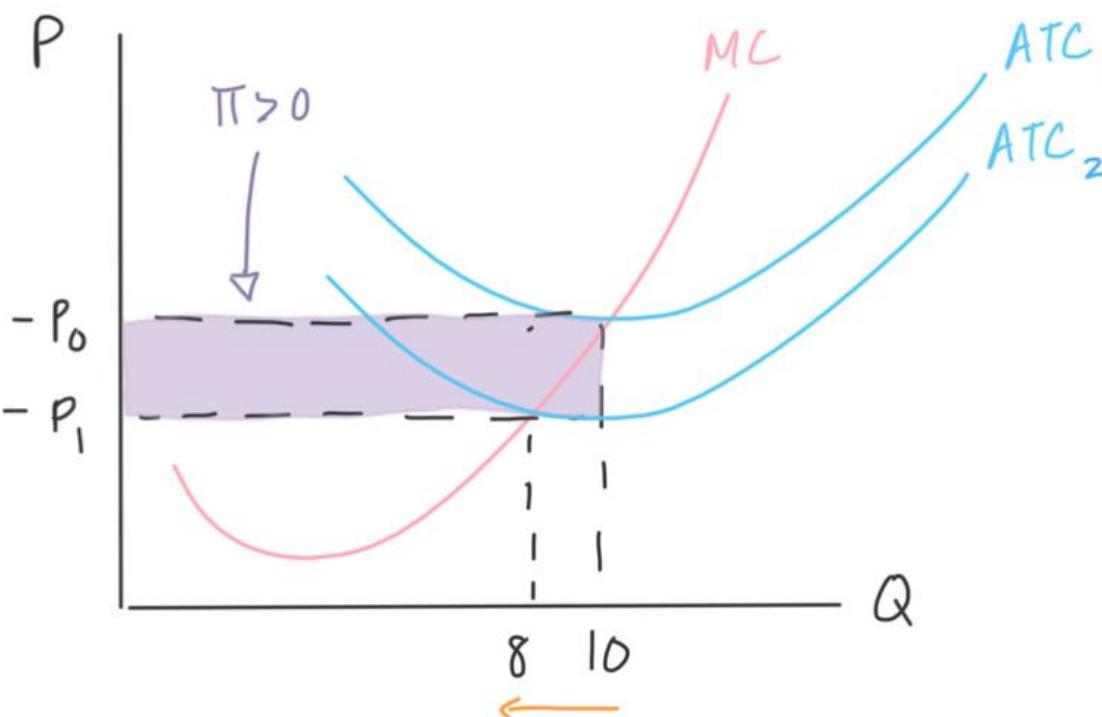
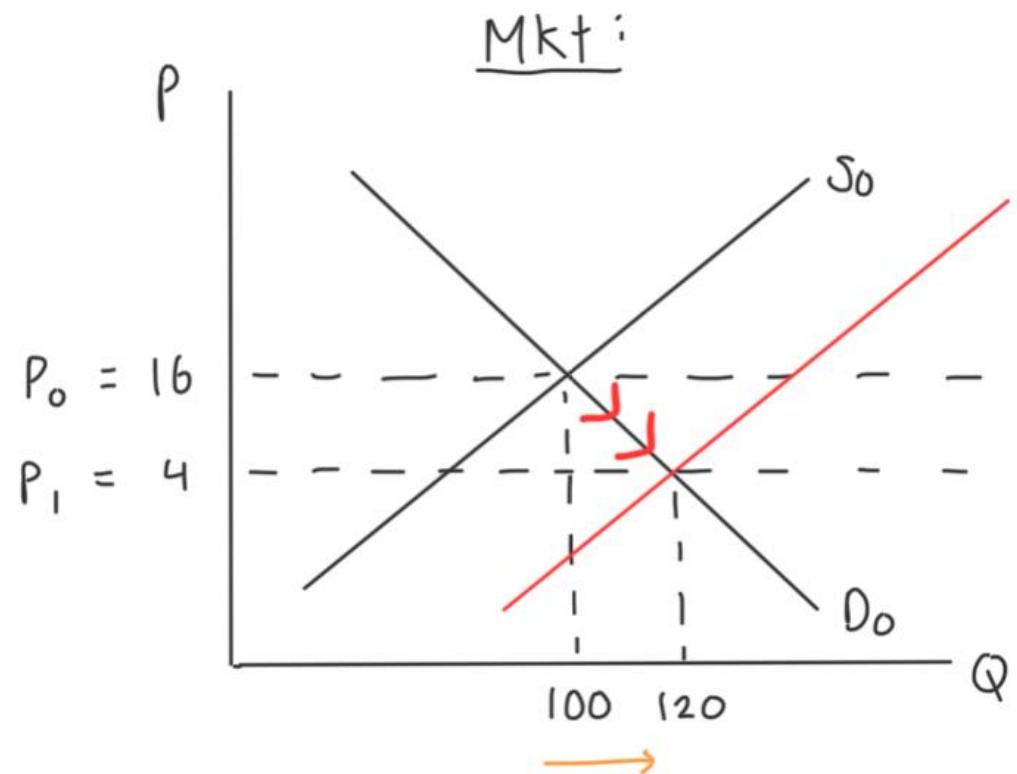
Now: each firm produces 10 units & 160 units are produced in total → 16 firms





2. Perfect Competition - Permanent Change in Supply

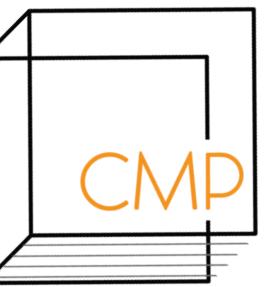
- Technology improves
 - originally at long run EQM \rightarrow ATC decreases, $\pi > 0 \rightarrow$ firms with the new technology enters the market, firms with the old technology switches to the new technology or exit the market \rightarrow market S increases \rightarrow market P decreases \rightarrow firm's Q decreases
 - Continue until $P = ATC_{2\ min}$ and $\pi = 0$
 - Result: more firms produce the equilibrium Q because firms entered



Before: each firm produces 10 units & 100 units are produced in total \rightarrow 10 firms

Now: each firm produces 8 units & 120 units are produced in total \rightarrow 15 firms

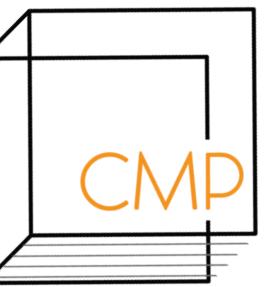




3. Monopoly

- **Monopoly:** market where,
 1. there are no close substitutes
 2. **high barriers to entry:** constraints that protect the firm from potential competitors
 - **natural monopoly:** the firm can produce at such low costs (economies of scale) that they can supply the entire market
 - **ownership monopoly:** the firm owns most of the key resources
 - **legal monopoly:** law restricts competition & entry (eg. public franchise, government license, patent, copyrights)

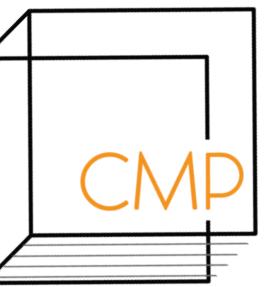




3. Monopoly Price-Setting - Single Price Monopoly (SPM)

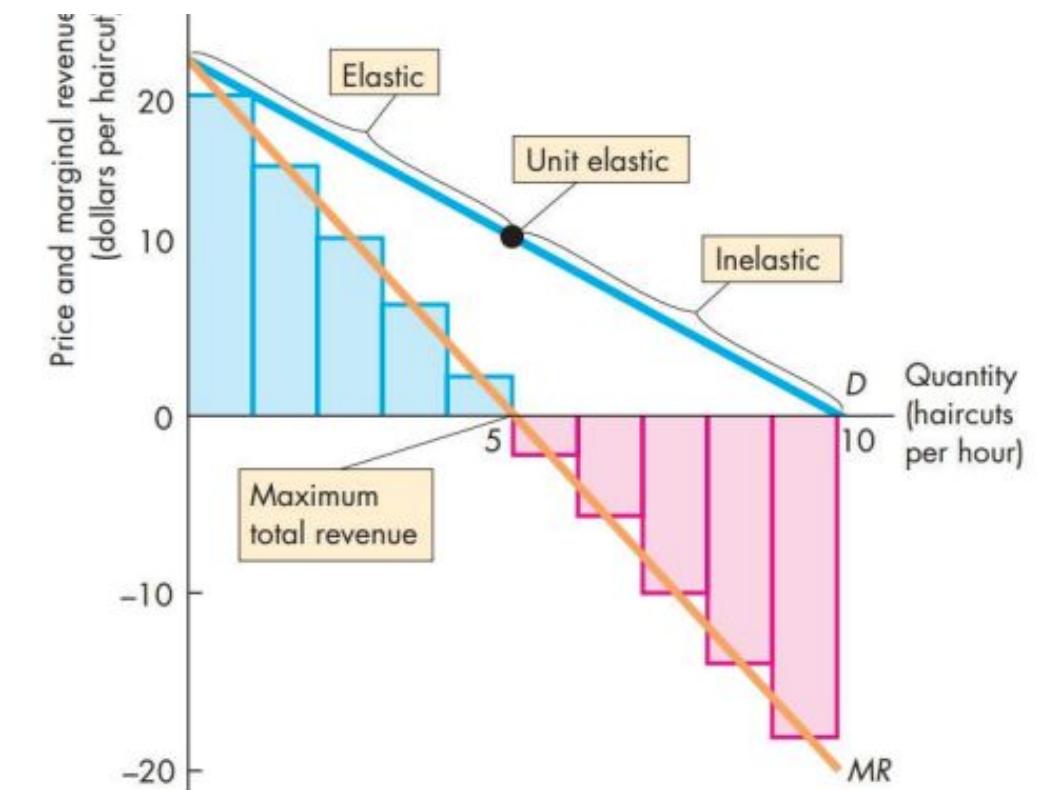
- **Single Price Monopoly:** when the monopoly firm sells each unit of output at the same price to everyone
- **price setter:** they set and highly influence the price
- market demand = demand for the monopoly's product
- must set a lower P in order to sell more
 - P always > MR because when you lower the P to sell 1 more unit, it results in a revenue loss on the original units sold, but a revenge gain on the additional quantity



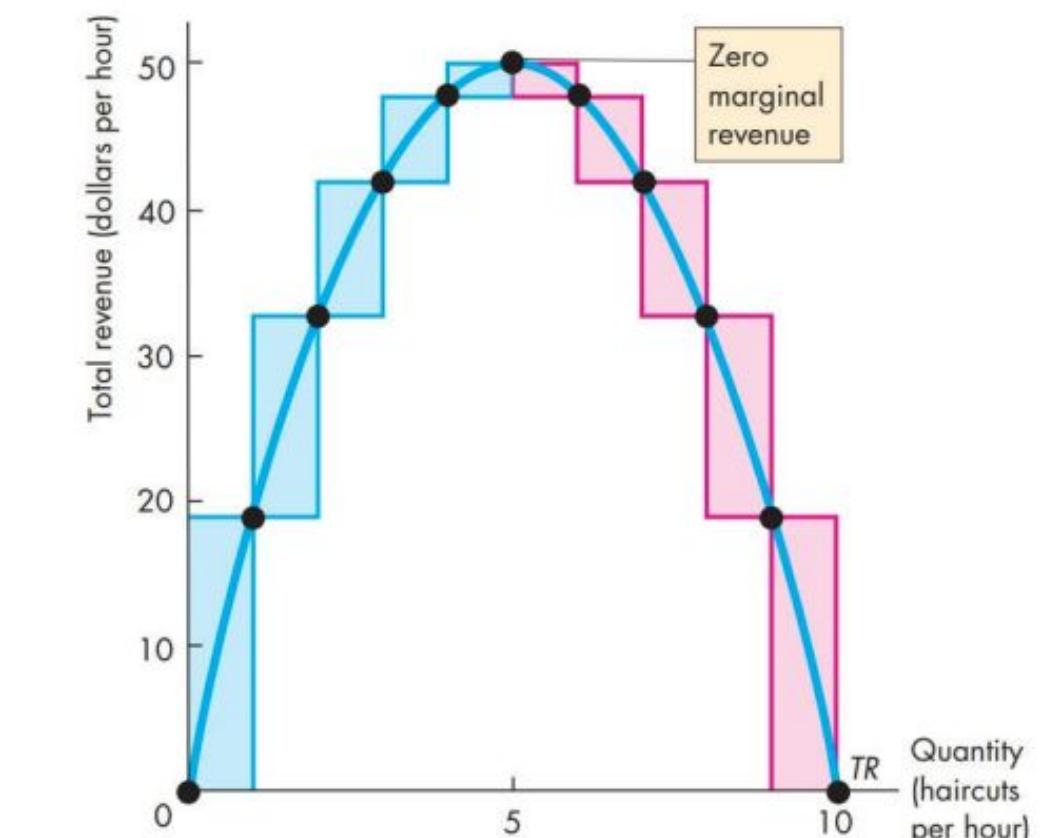


3. Monopoly Price-Setting Strategies - Single Price Monopoly

- monopoly's demand is always elastic
 - they never produce at an output level where demand is inelastic
 - they control the market price so would decrease Q to move to where $ed = 1$

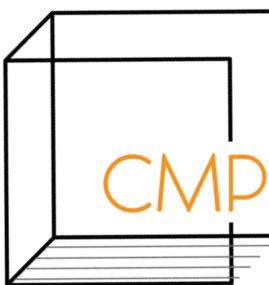


(a) Demand and marginal revenue curves



(b) Total revenue curve



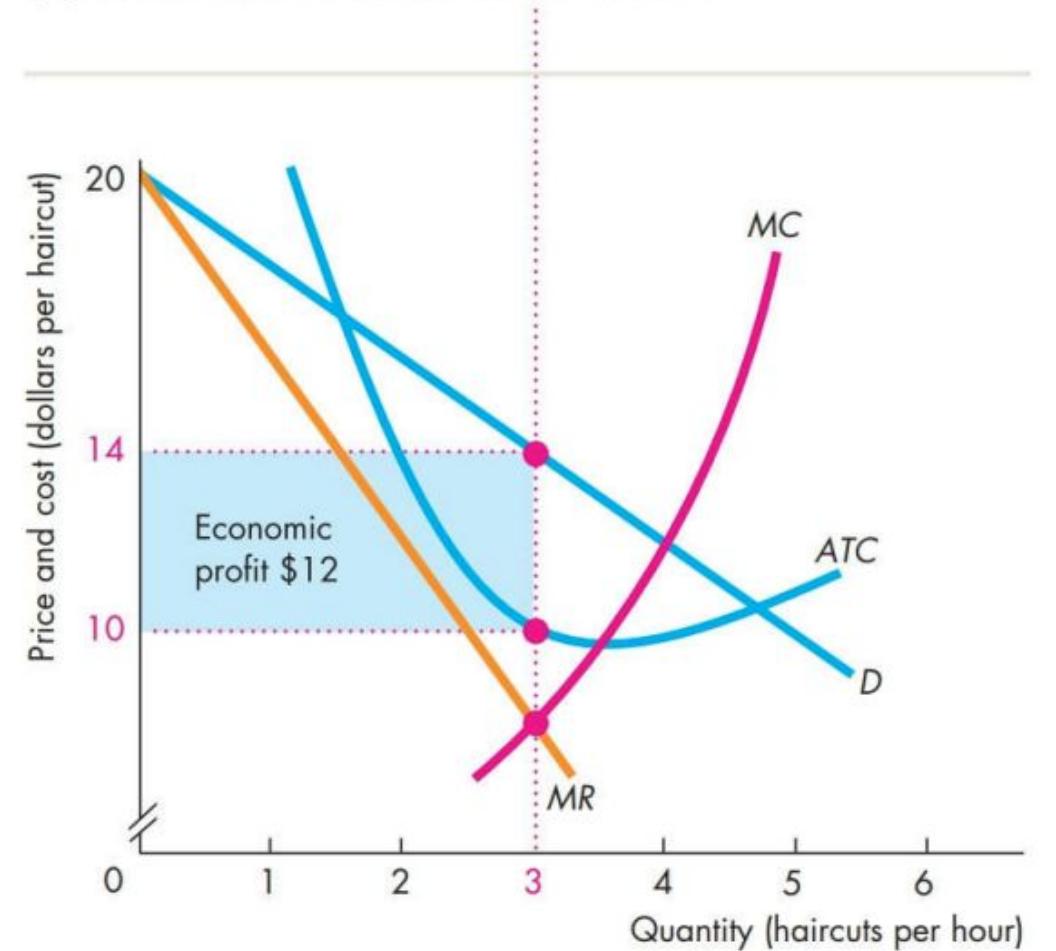
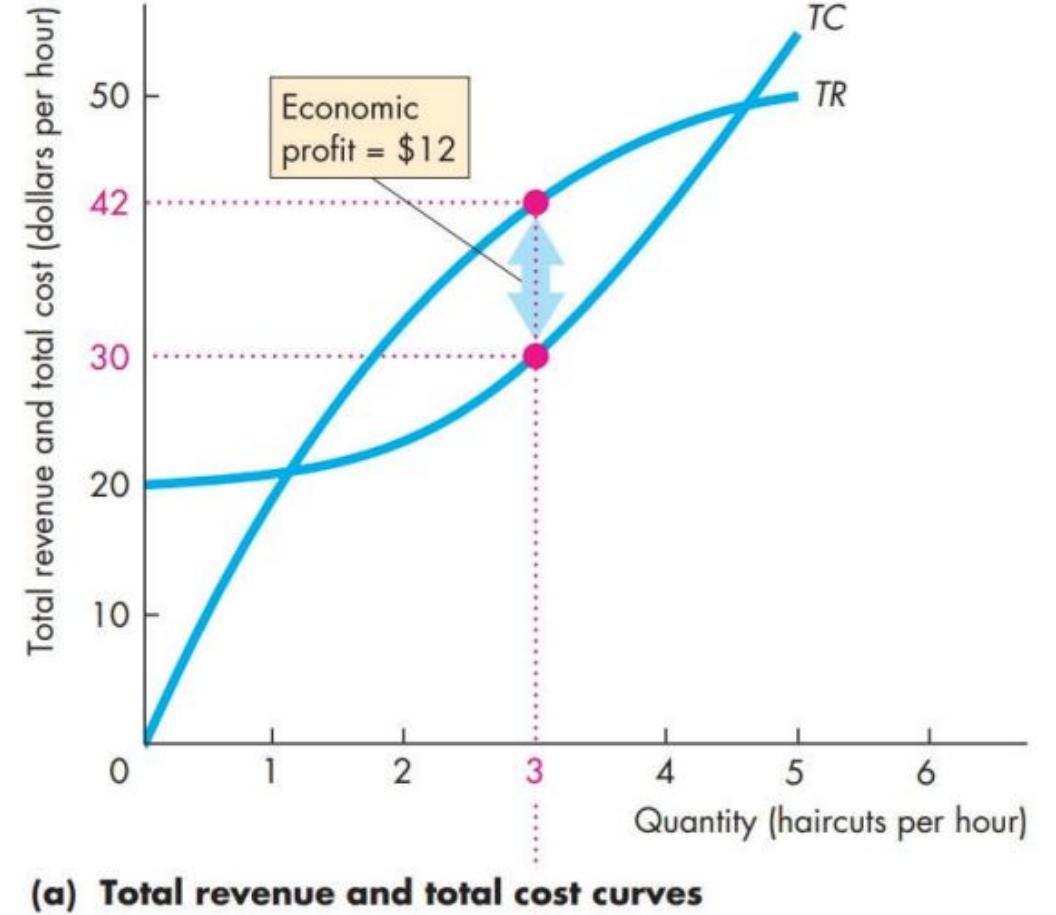


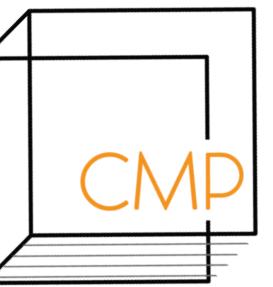
3. Monopoly Price-Setting - Single Price Monopoly (SPM)

- in a monopoly, the profit maximizing quantity is still where $MR = MC$
- MR 's slope = double the demand function's slope
 - $P = 20 - 2Q$
 - $MR = 20 - 4Q$

Steps to solving Monopoly problems:

- Find the MR function
- Set $MR = MC$ to solve for the profit maximizing quantity
- Plug the profit maximizing quantity in the demand function to solve for the monopoly price
- Calculate the profit
- Calculate the DWL





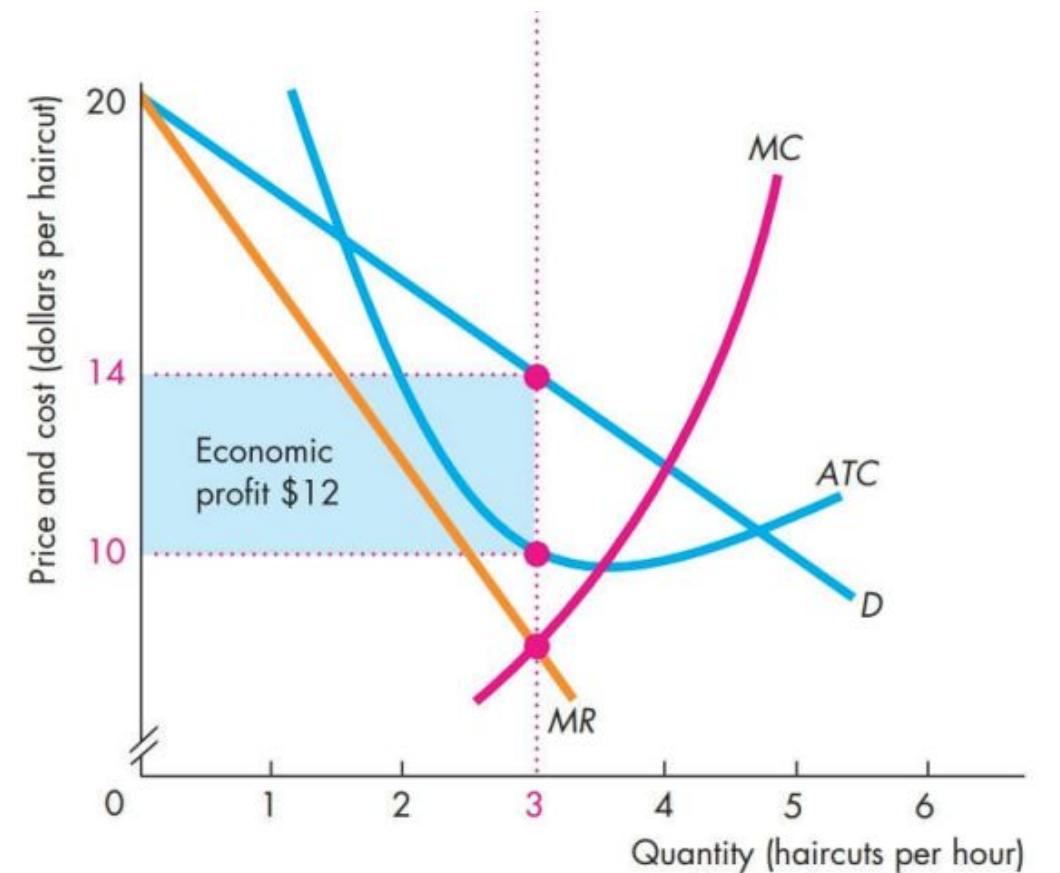
4. Monopoly

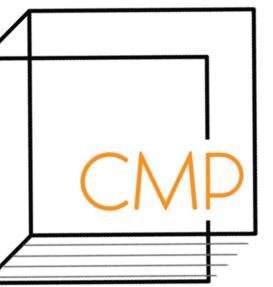
Q: Canada Post, a monopoly in the Canadian mail market, has a demand function of $P = 32 - 2Q$ and a marginal cost function of $MC = 4$.

a. What is their marginal revenue function?

b. What is the profit maximizing quantity and price?

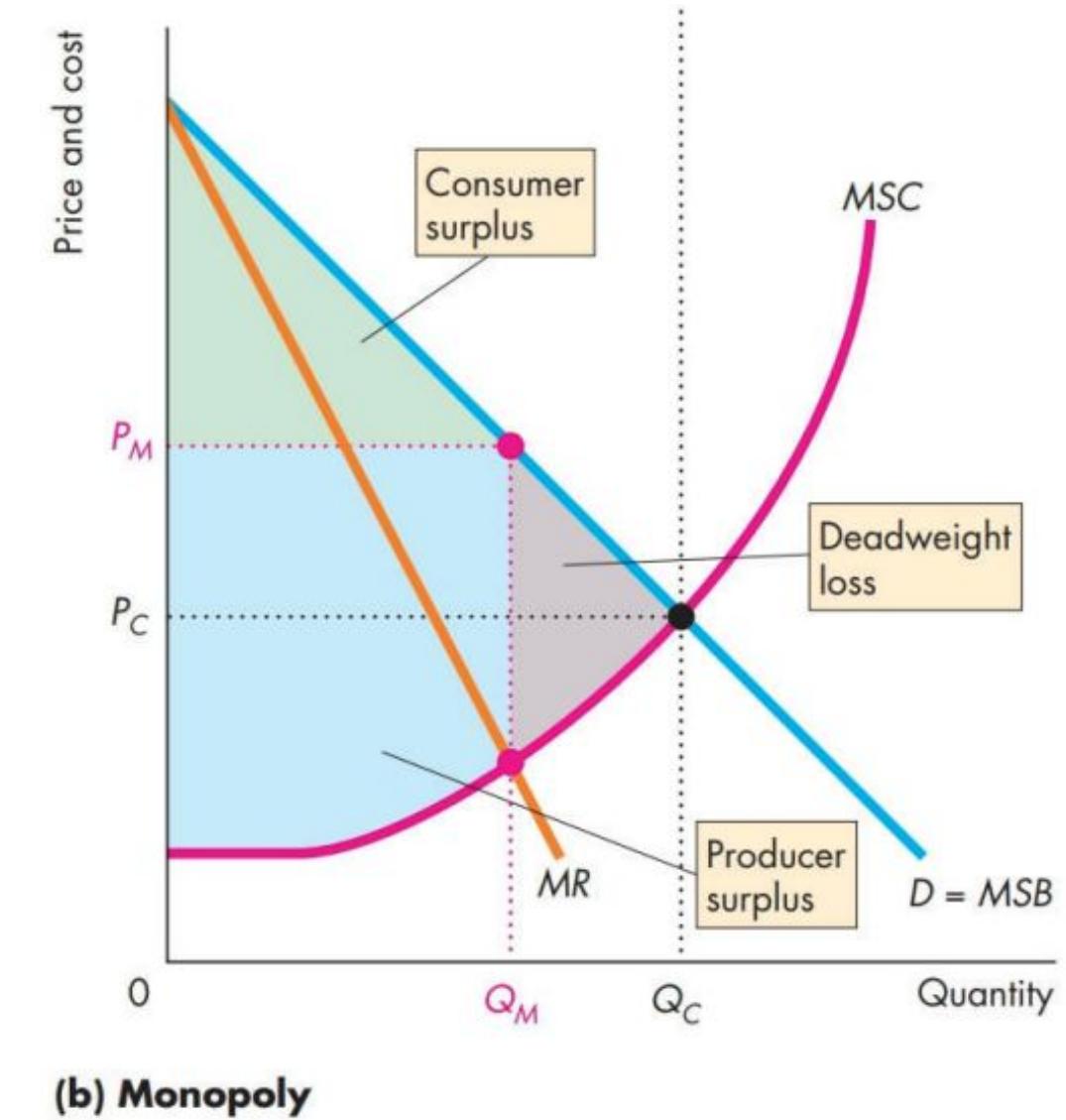
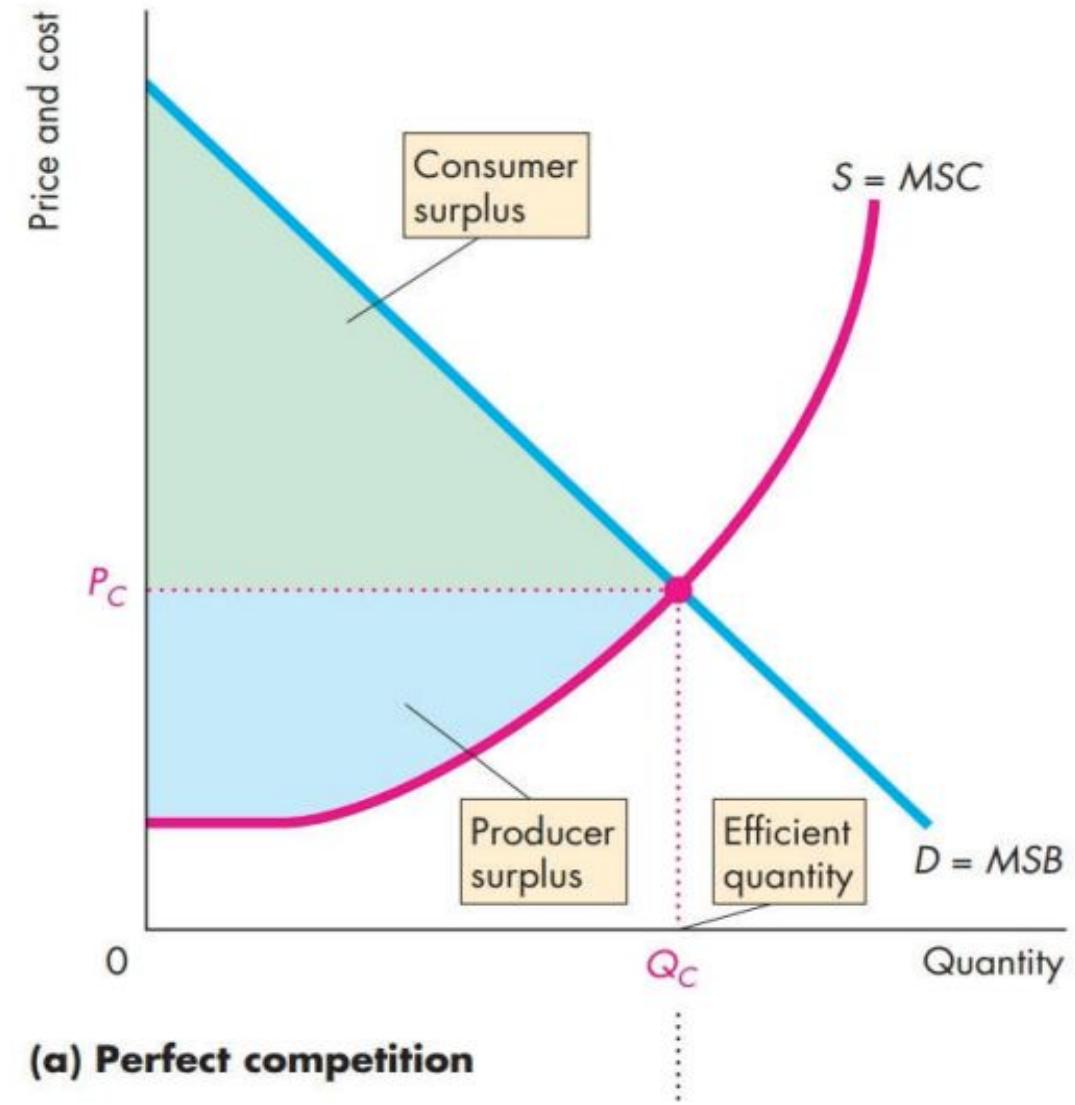
c. If their $ATC = 6$, what's their profit?





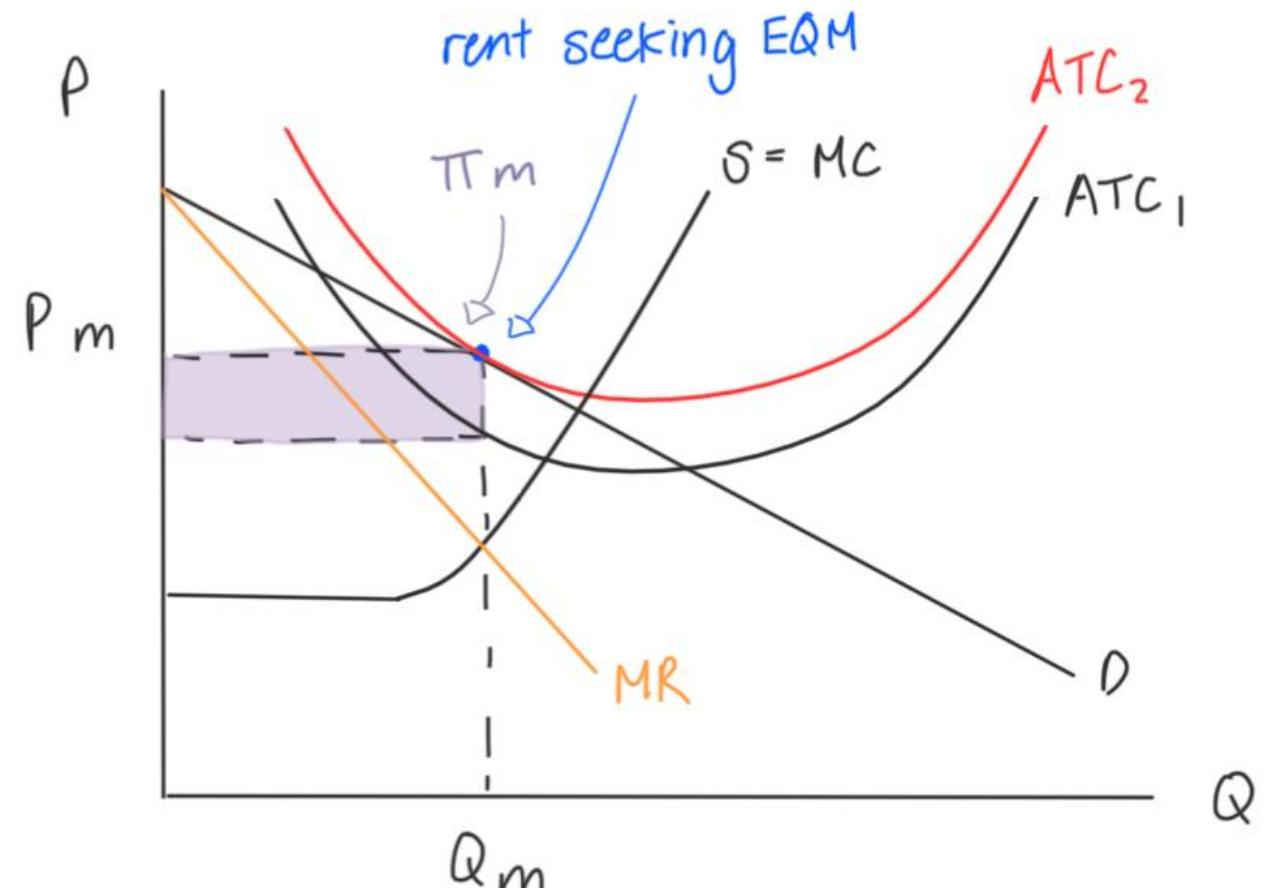
3. Single Price Monopoly vs. Perfect Competition

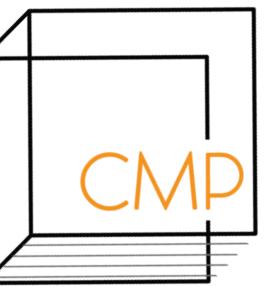
- CS decreased, PS increased
- there's DWL
- monopoly is inefficient



3. Monopoly - Rent Seeking

- **economic rent:** any surplus including CS, PS, or economic profit
- **rent seeking:** the pursuit of wealth by capturing economic rent, do that by:
 - buying a monopoly
 - creating a monopoly
- when one seeks monopoly rent, they are using resources to gain more control, so TC increases until the firm breaks even at the profit maximizing price





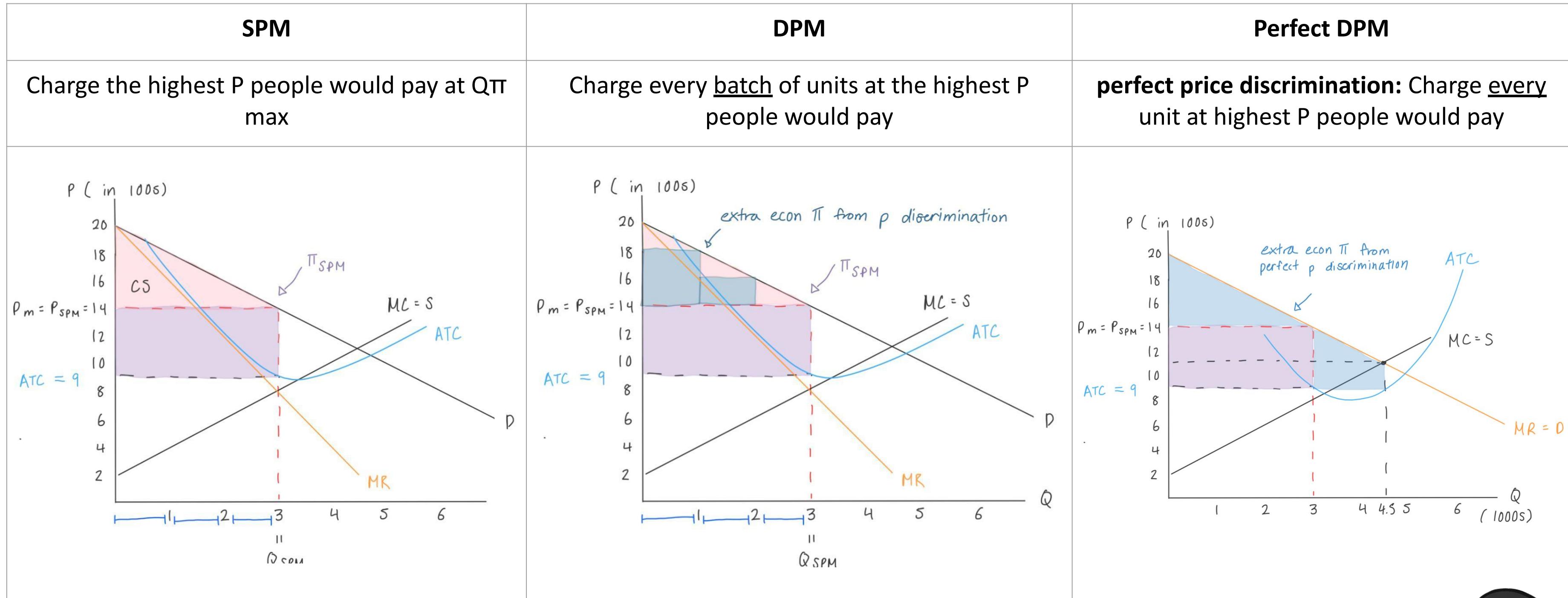
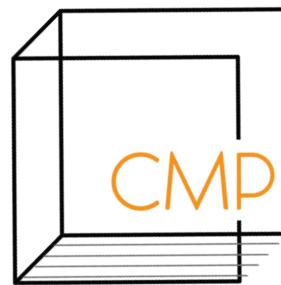
3. Monopoly Price-Setting - Discriminating Price Monopoly (DPM)

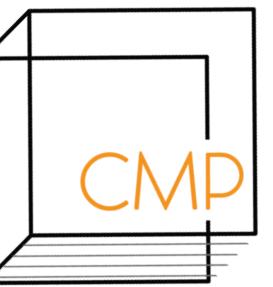
- **price discrimination:** selling different units at different prices
- **discriminating price monopoly:** a monopoly that uses price discrimination
- in order to do so, must:
 1. be able to identify different buyer types
 2. product can't be resold
- can discriminate among
 1. groups of buyers (eg. advance tickets, airline)
 2. units of goods (eg. quantity discounts)



3. SPM, DPM, & ... Perfect DPM

the more perfect the DPM is, the more it is efficient





3. Monopoly

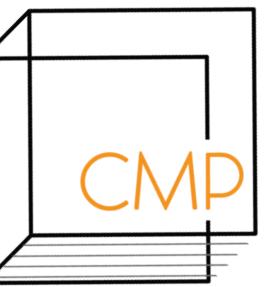
Q: The quantity sold in a Perfect DPM is the same as the quantity sold in a ___?

- a) DPM
- b) SPM
- c) Perfect Competition
- d) None of the above

Q: Which statement(s) are correct?

- I. SPM is more efficient than DPM
 - II. SPM is just as efficient as DPM
 - III. Perfect Competition is more efficient than Perfect DPM
 - IV. Perfect DPM is more efficient than DPM
-
- a) I, III
 - b) II, IV
 - c) II only
 - d) III only





3. Monopoly Regulations

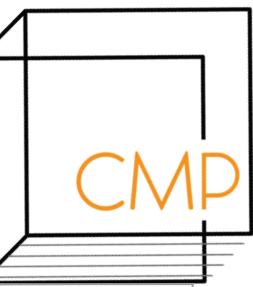
- **regulation:** rule set by the government that's meant to influence the P, Q, and/or entry
- 2 theories about how regulations work:
 - **social interest theory:** political & regulatory processes seek out inefficiency and tries to eliminate DWL
 - **capture theory:** serves the producer's self-interest who captures the regulator and maximizes profit

For Natural Monopoly:

- **marginal cost pricing rule:** set $P = MC$
 - when $P = MC$, $Q_e = Q_d$
 - forces natural monopolies to produce Q_e

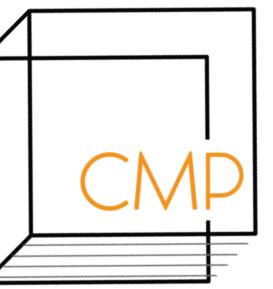


3. Monopoly Regulation - Marginal Cost Pricing Rule



Unregulated	Regulated
<ul style="list-style-type: none"> - Charge the highest P that people are willing to pay at $Q_{\pi \text{ max}}$ - The firm earns profit but it creates DWL <p>$P_m = 60$</p> <p>$DWL = \frac{1}{2} (60-10)(10-5)$</p> <p>$Q_m$ ($Q_{\pi \text{ max}}$)</p> <p>Q_e</p>	<ul style="list-style-type: none"> - Set $P = MC$ - The firm produces Q_e, no DWL, but they incur a loss <p>$P = MC = 10$</p> <p>$P_m = 60$</p> <p>Q_e</p> <p>Q_m ($Q_{\pi \text{ max}}$)</p>

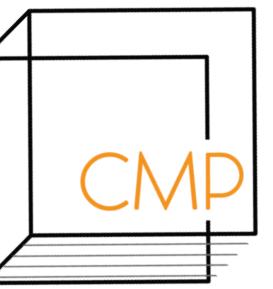




3. Monopoly Regulation - Marginal Cost Pricing Rule

- To cover cost under the marginal cost pricing rule:
 1. the government can pay the firm a **subsidy** that's equal to the loss
 2. the firm can be allowed to do a little bit of **price discrimination**
 3. the firm can charge a **one-time fee** to cover the fixed cost, then charge the units sold at $P = MC$





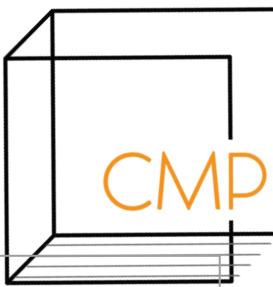
3. Monopoly Regulation - Average Cost Pricing Rule

For Natural Monopoly:

- **average cost pricing rule:** set $P = AC$
 - when $P = AC$, $Q_e = Q_d$
 - forces natural monopolies to produce Q_e without incurring a loss

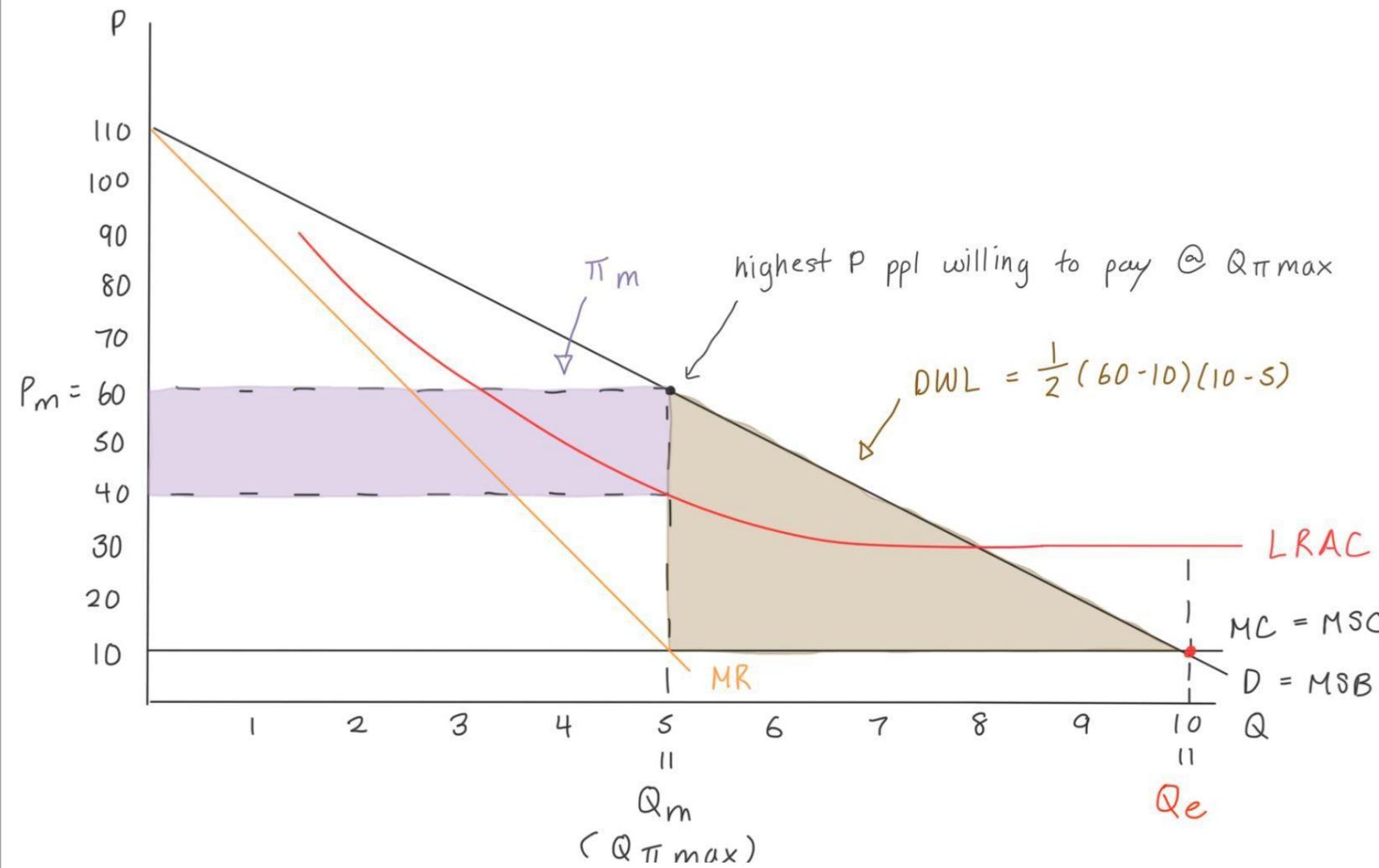


3. Monopoly Regulation - Average Cost Pricing Rule



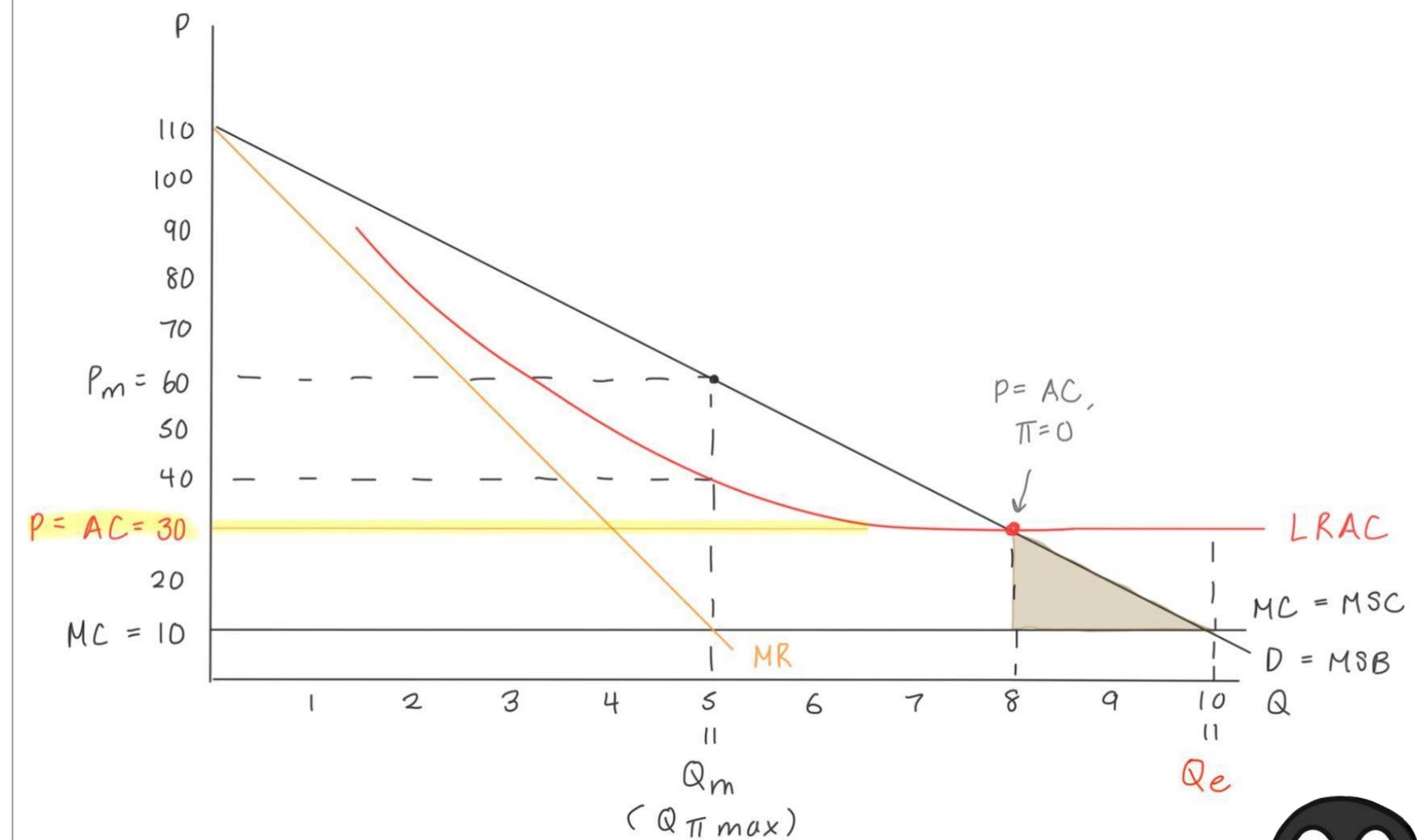
Unregulated

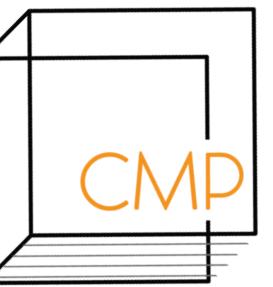
- Charge the highest P that people are willing to pay at $Q_{\pi \max}$
- The firm earns profit but it creates DWL



Regulated

- Set $P = AC$
- producing closer to Q_e , still inefficient but smaller DWL, no loss



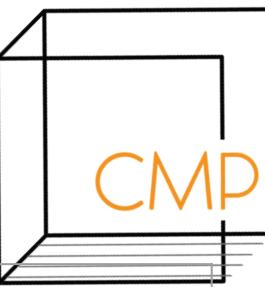


3. Monopoly Regulation - Rate of Return Regulation, Price Ceiling

- **rate of return regulation:** when a firm isn't allowed to set a price that would give them a return on capital that exceeds a specific target rate
 - BUT firms can inflate their costs and purposely use more capital to cheat
 - The greater the amount of the capital, the greater the return on capital allowed would be, the greater the price they can charge
- **Price ceiling (cap):** when the government specifies the highest P that a firm can charge
 - gives firms an incentive to minimize their costs and operate efficiently

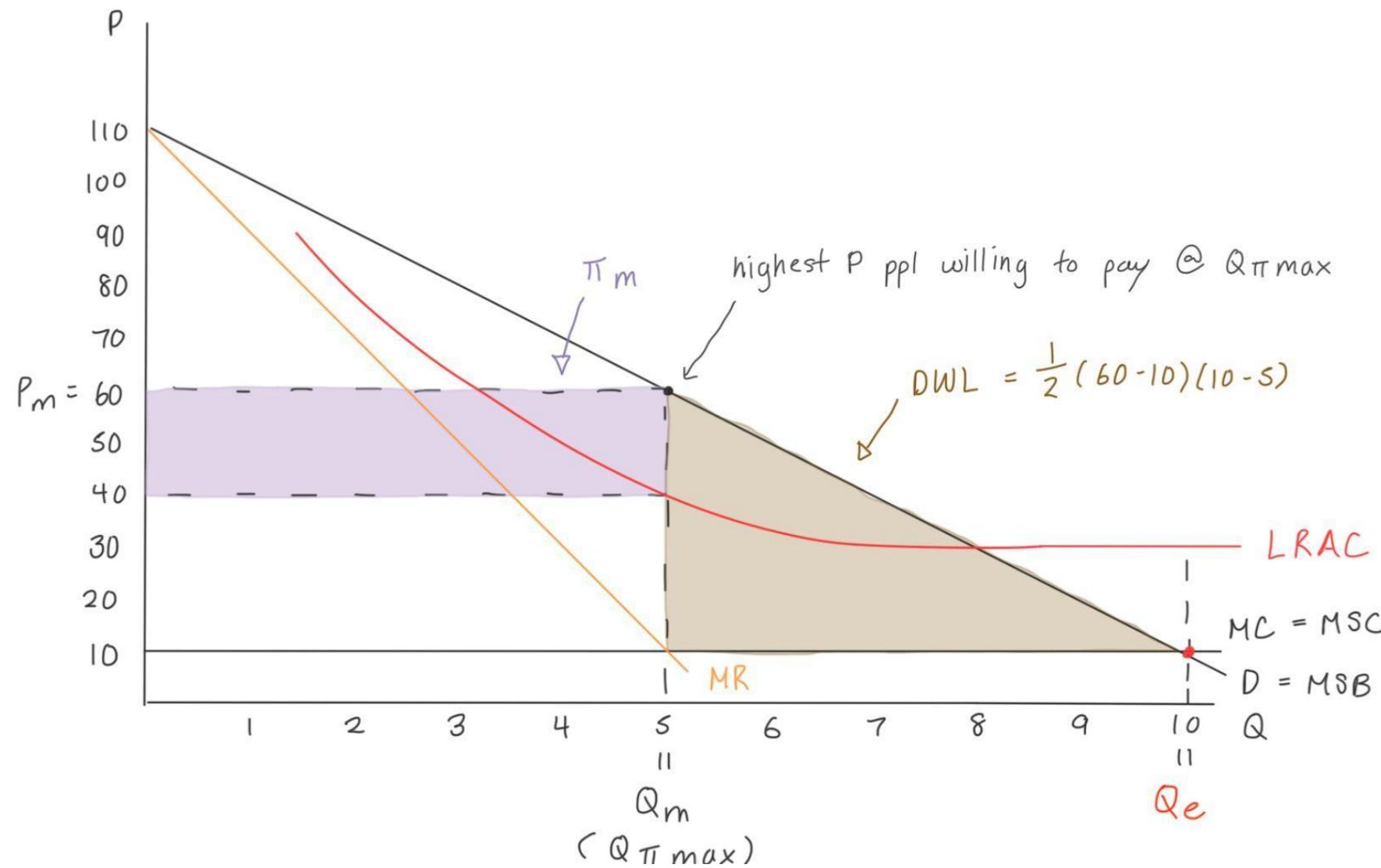


3. Monopoly Regulation - Price Ceiling



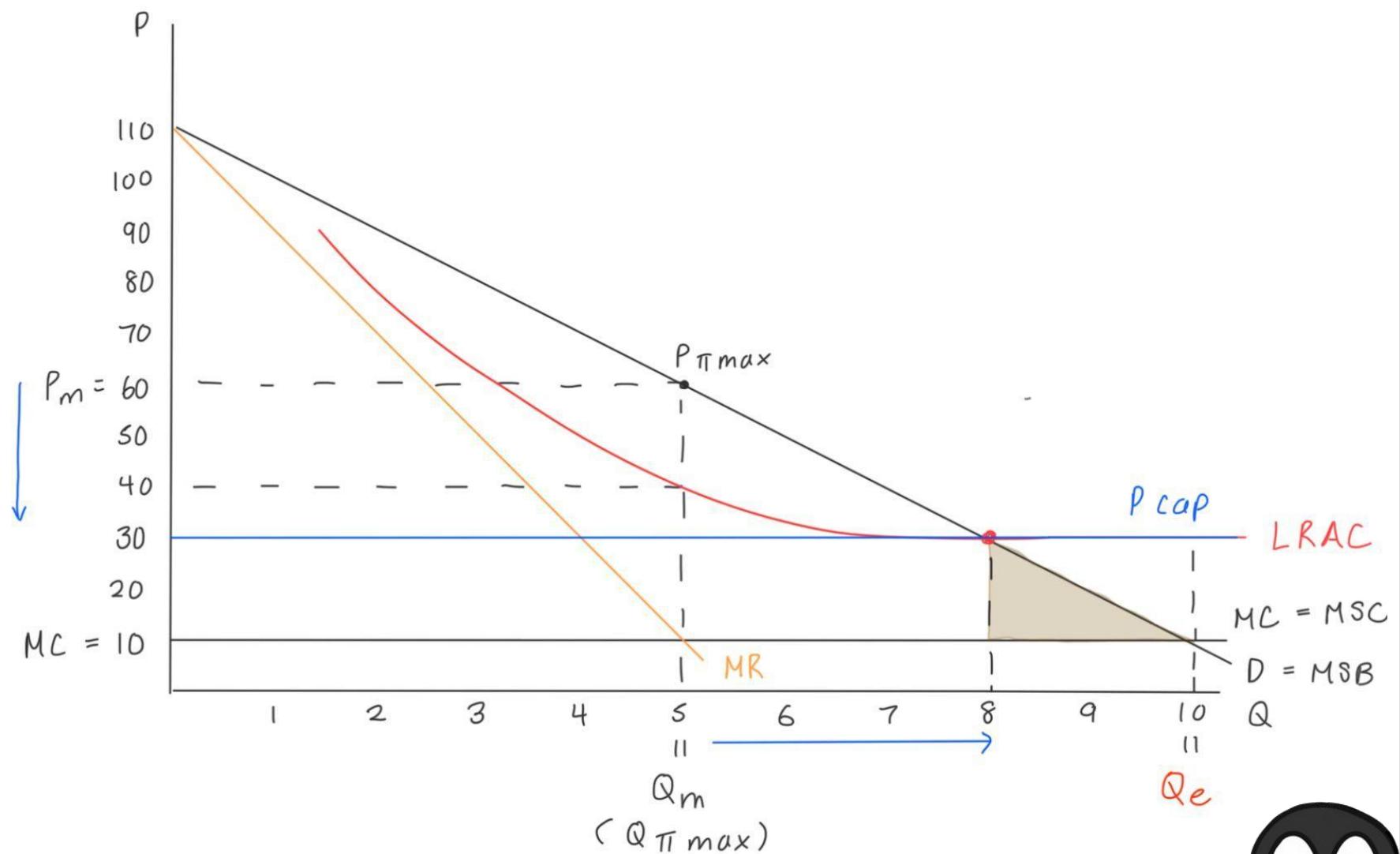
Unregulated

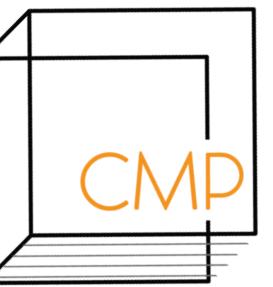
- Charge the highest P that people are willing to pay at $Q_{\pi \max}$
- The firm earns profit but it creates DWL



Regulated

- Set Price Ceiling
- producing closer to Q_e , still inefficient but smaller DWL, no loss

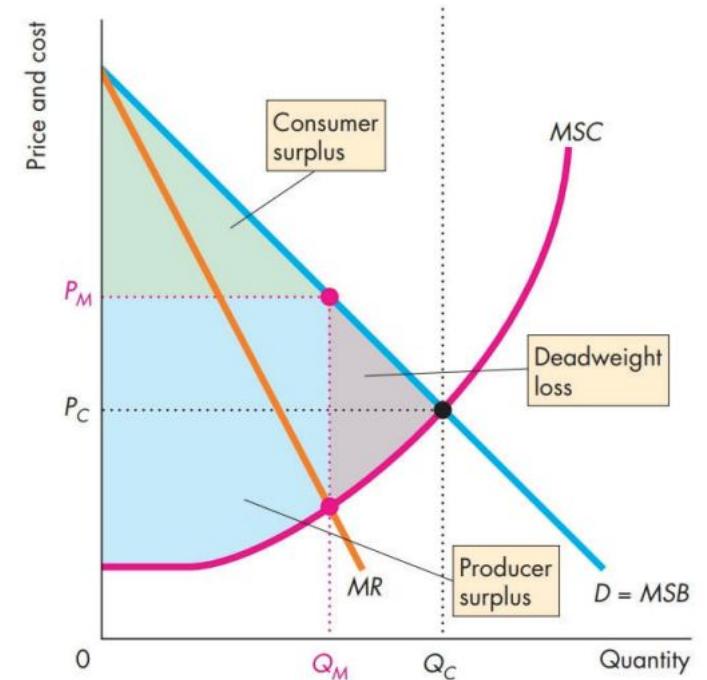


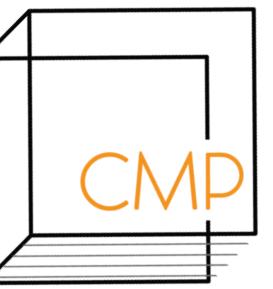


3. Perfect Competition vs. Monopoly

Q: Match the following market characteristics with Perfect Competition, Monopoly, or Neither

1. Many buyers & 2 sellers
2. No barriers to entry
3. $P = MC$
4. There are no close substitutes
- 5.





PART 2

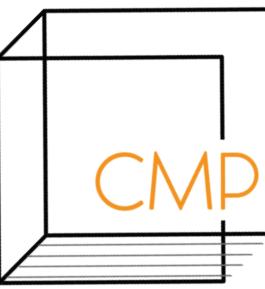
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Part 2:

- Global Market in Action
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- Output & Costs
- Utility & Demand

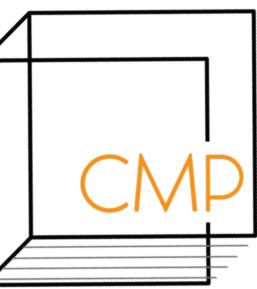
Part 3:

- What is Economics
- PPF, Gains from Trade
- Demand & Supply
- Elasticity
- Surplus & Efficiency



Newest to oldest



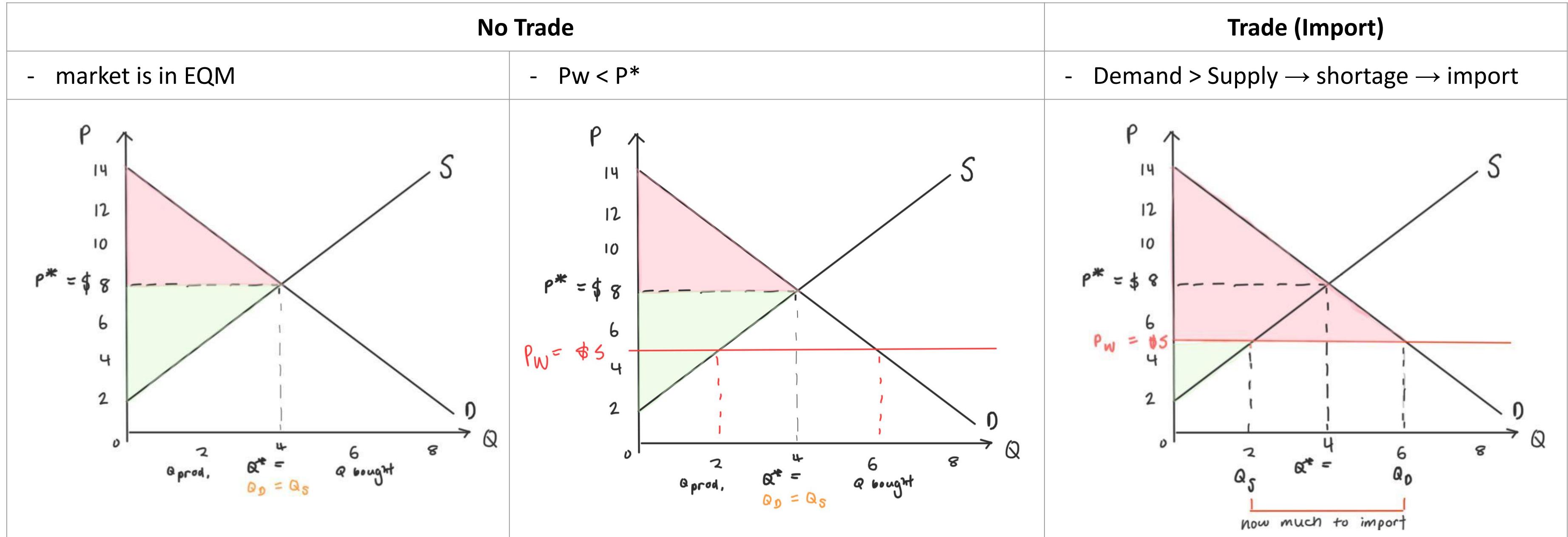


4. Global Market in Action

- **national comparative advantage** (a nation can produce a good/service at a lower OC than any other nation) > trade
 - **imports**: buy goods/services from other countries
 - **exports**: sell goods/services to other countries
- 6 Possible Situations:
 1. No trade
 2. Free trade where the world price (P_w) is *below* the EQM price (P^*)
 3. Free trade where the world price (P_w) is *above* the EQM price (P^*)
 4. Tariffs
 5. Import Quota
 6. Export Subsidy

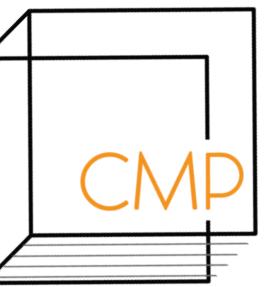


4. Global Market in Action - No Trade → Importing

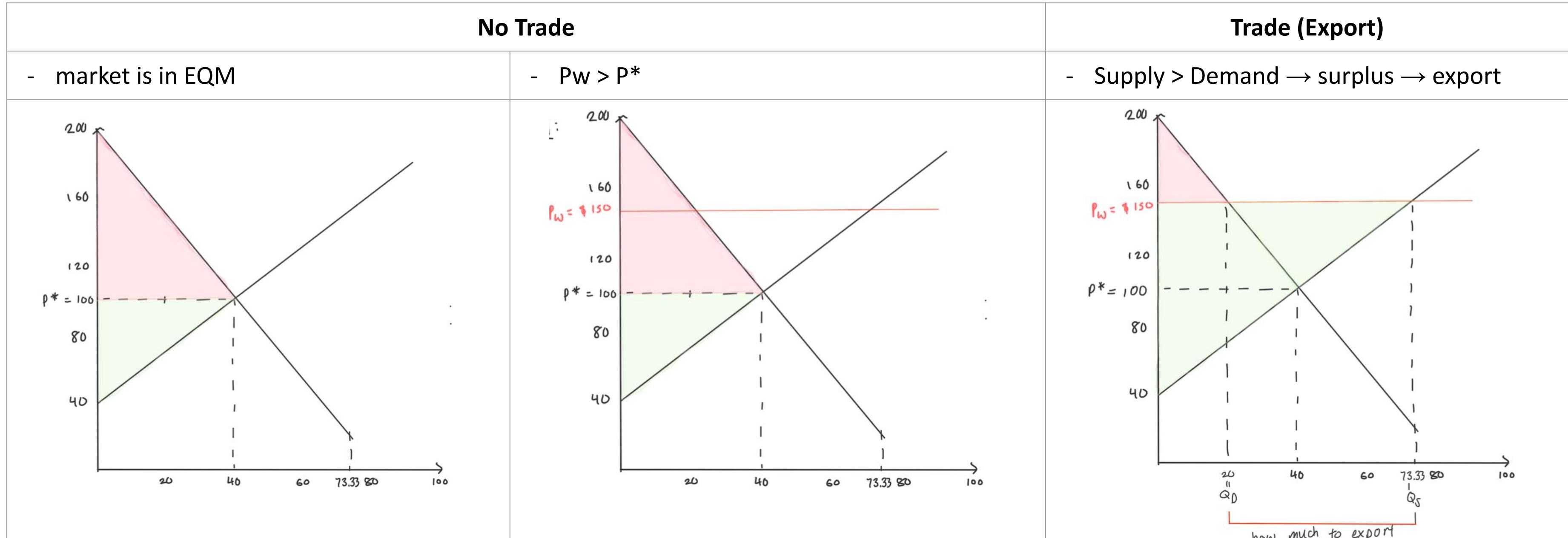


Consumers gain, producers lose





4. Global Market in Action - No Trade → Exporting



Producers gain, consumers lose



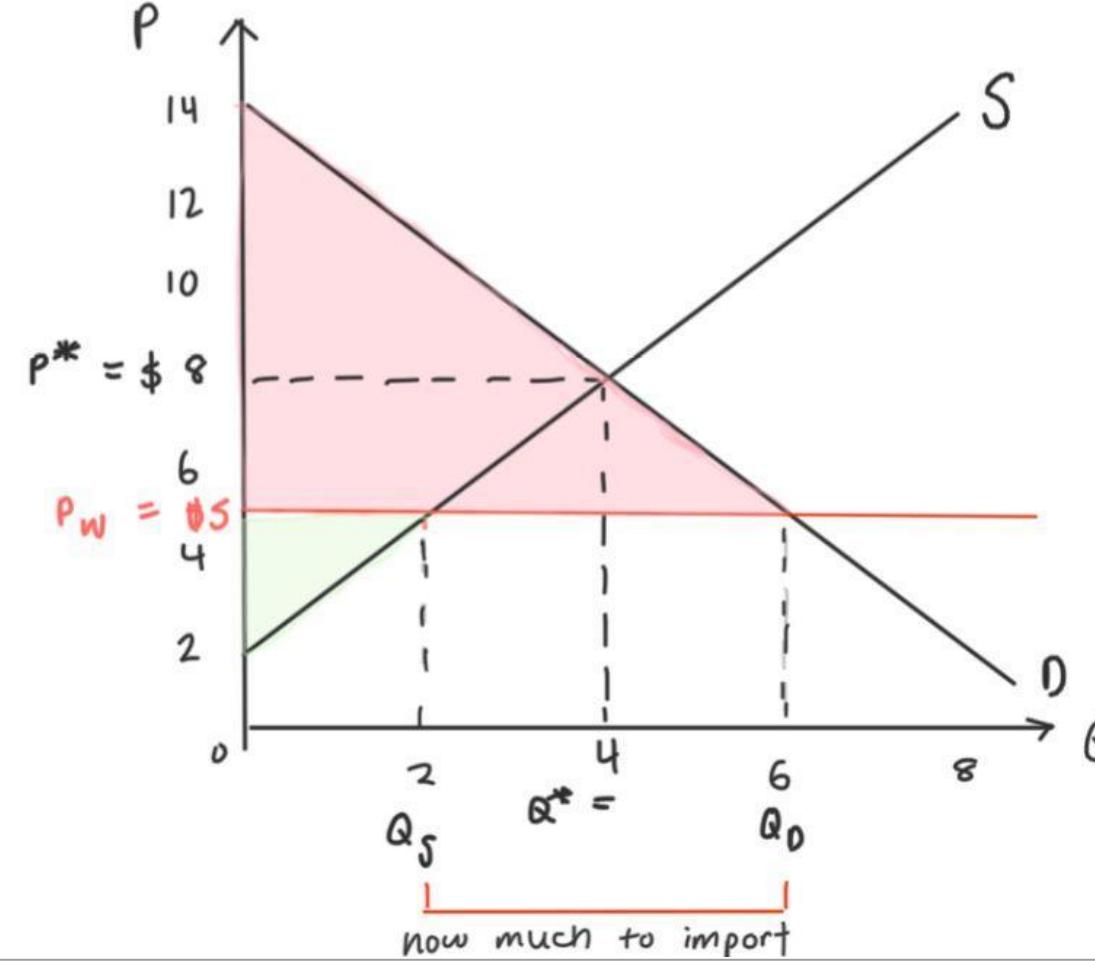
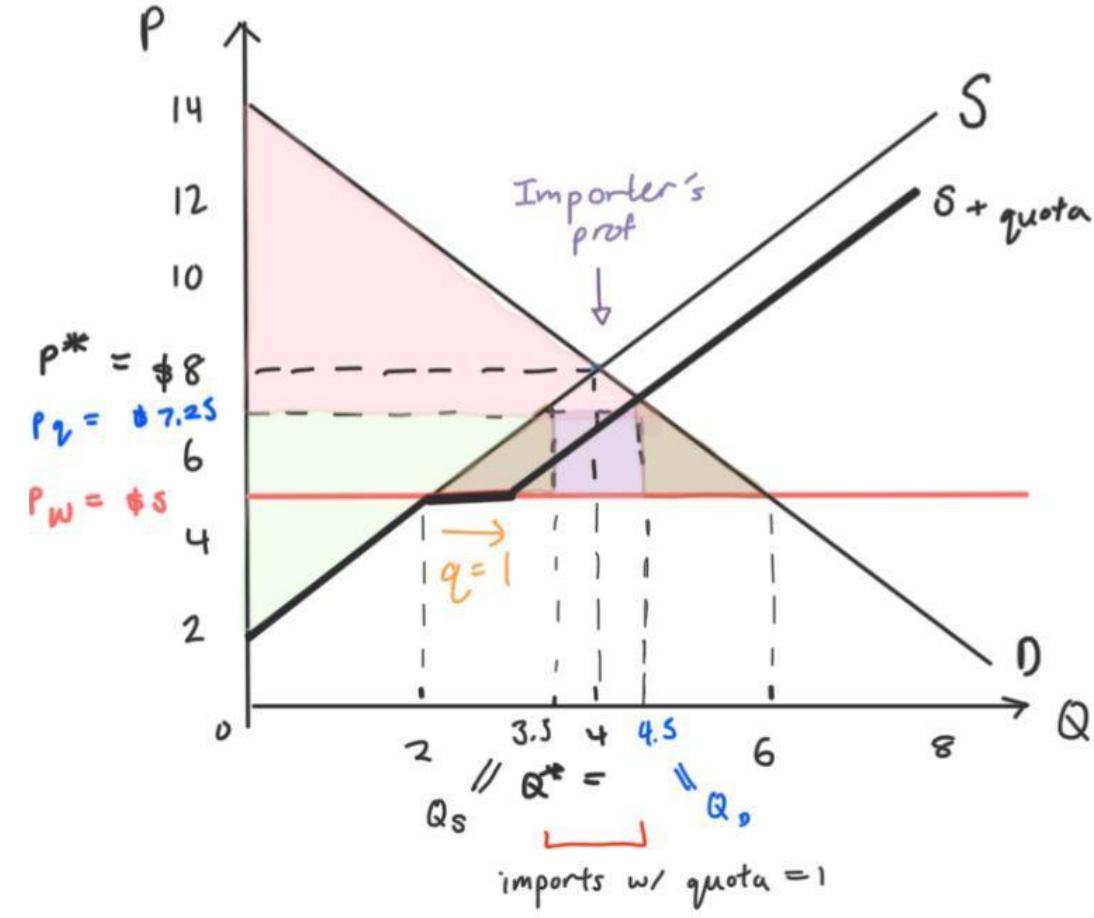
4. Global Market in Action - Tariffs on Imports

Import	Tariffs on Imports
<ul style="list-style-type: none"> - Consumers import an amount that's equal to the shortage 	<ul style="list-style-type: none"> - tariff: when the importing country puts a tax on imported goods - Eg. the government implements \$2 tariff per unit of the good
<p>Graph illustrating imports without a tariff:</p> <ul style="list-style-type: none"> Y-axis: Price (P) X-axis: Quantity (Q) Solid black lines: Supply (S) and Demand (D). Point $P^* = \\$8$ is the intersection of S and D. Point $P_w = \\$5$ is the intersection of S and a horizontal line parallel to D. The vertical distance between P^* and P_w is labeled $\\$3$. The horizontal distance between the intersection of P_w and D (Q_S) and the intersection of P^* and S (Q_D) is labeled $Q^* = 4$. The area under the demand curve from P_w to P^* is shaded pink and labeled "now much to import". 	<p>Graph illustrating tariffs on imports:</p> <ul style="list-style-type: none"> Y-axis: Price (P) X-axis: Quantity (Q) Solid black lines: Supply (S) and Demand (D). Point $P^* = \\$8$ is the intersection of S and D. Point $P_w = \\$5$ is the intersection of S and a horizontal line parallel to D. Point $P_{w+tariff} = \\$7$ is the intersection of S and a horizontal line parallel to D at a higher price level. The vertical distance between P^* and $P_{w+tariff}$ is labeled $\\$2$, representing the tariff. The horizontal distance between Q_S (at P_w) and Q_D (at P^*) is labeled $Q^* = 4$. The horizontal distance between Q_S and Q_D is labeled $imports = 1.34$. The area under the demand curve from P_w to $P_{w+tariff}$ is shaded green. The area under the demand curve from $P_{w+tariff}$ to P^* is shaded purple.

Consumers lose, producers gain, government gains, society as a whole lose



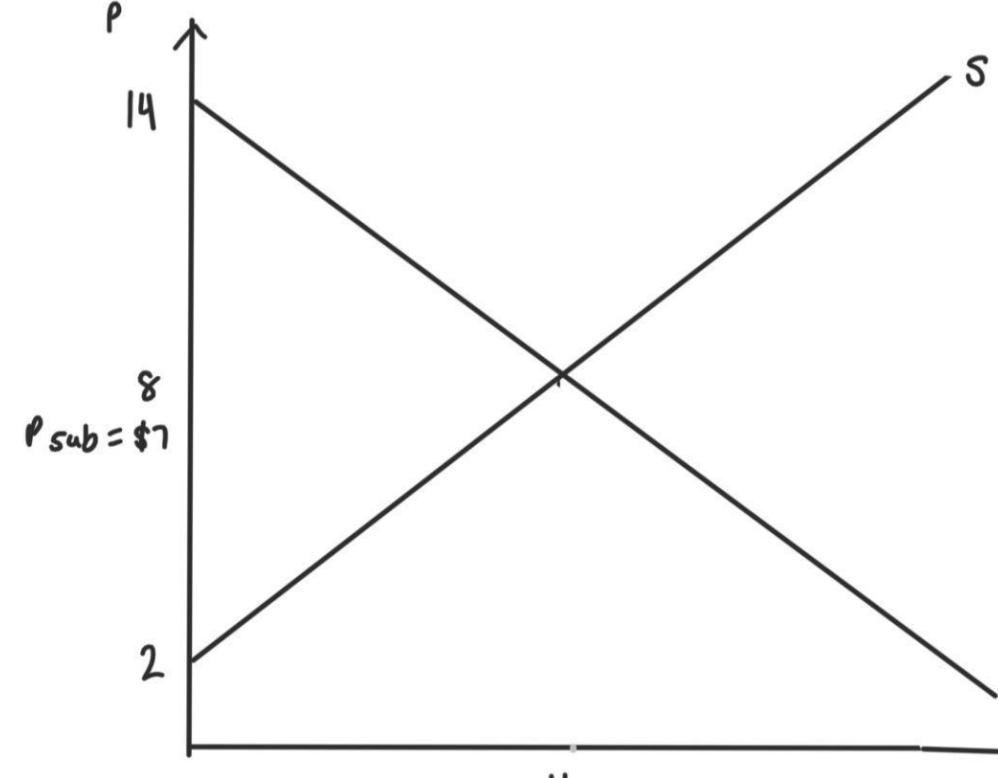
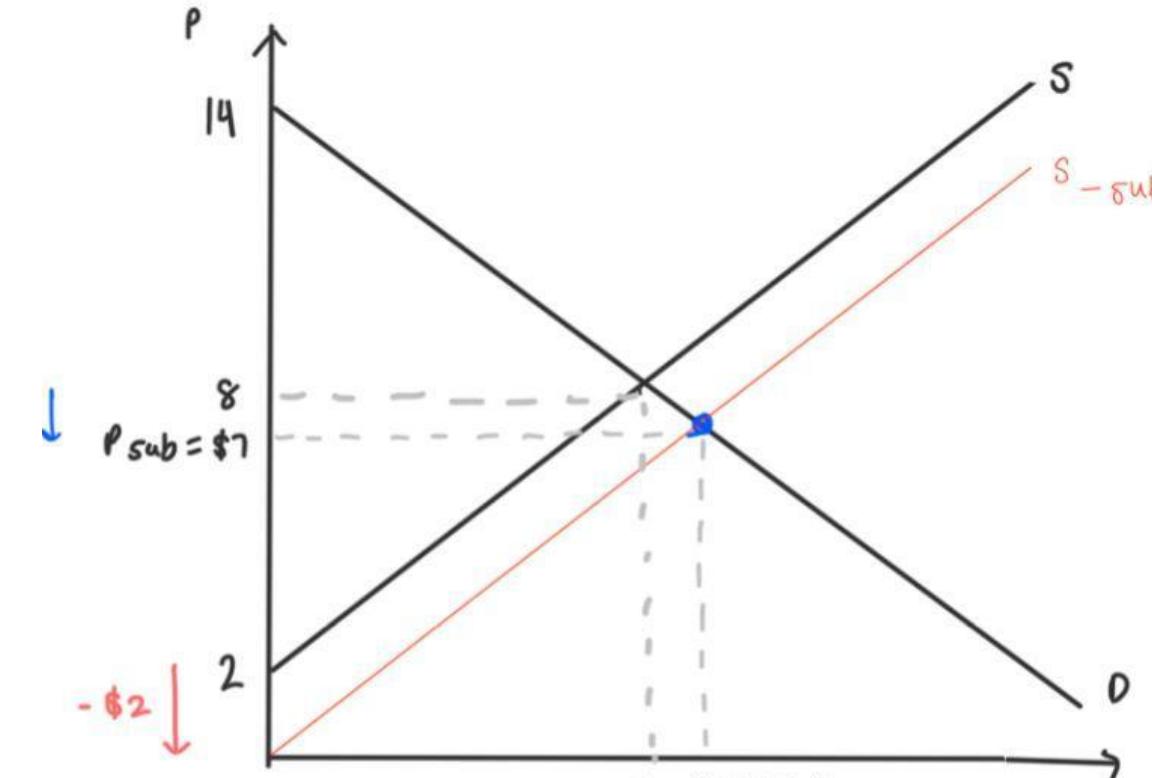
4. Global Market in Action - Quota on Imports

Import	Quota on Imports
<ul style="list-style-type: none"> Consumers import an amount that's equal to the shortage  <p>Import graph details: - Price levels: $P^* = \\$8$, $P_W = \\$5$ - Quantities: $Q_S = 2$, $Q_D = 4$, $Q^* = 4$ - Area labels: "now much to import" (pink triangle)</p>	<ul style="list-style-type: none"> import quota: limits how much of a good can be imported S+quota is the new supply curve Eg. the government a quota of 1 unit of the good  <p>Quota on Imports graph details: - Price levels: $P^* = \\$8$, $P_V = \\$7.25$, $P_W = \\$5$ - Quantities: $Q_S = 2$, $Q_D = 4$, $Q^* = 4$, $q = 1$, $Q_{S+quota} = 3.5$, $Q_{D+quota} = 4.5$ - Area labels: "Importer's prof", "imports w/ quota = 1"</p>

Consumers lose, producers gain, government gains, society as a whole lose



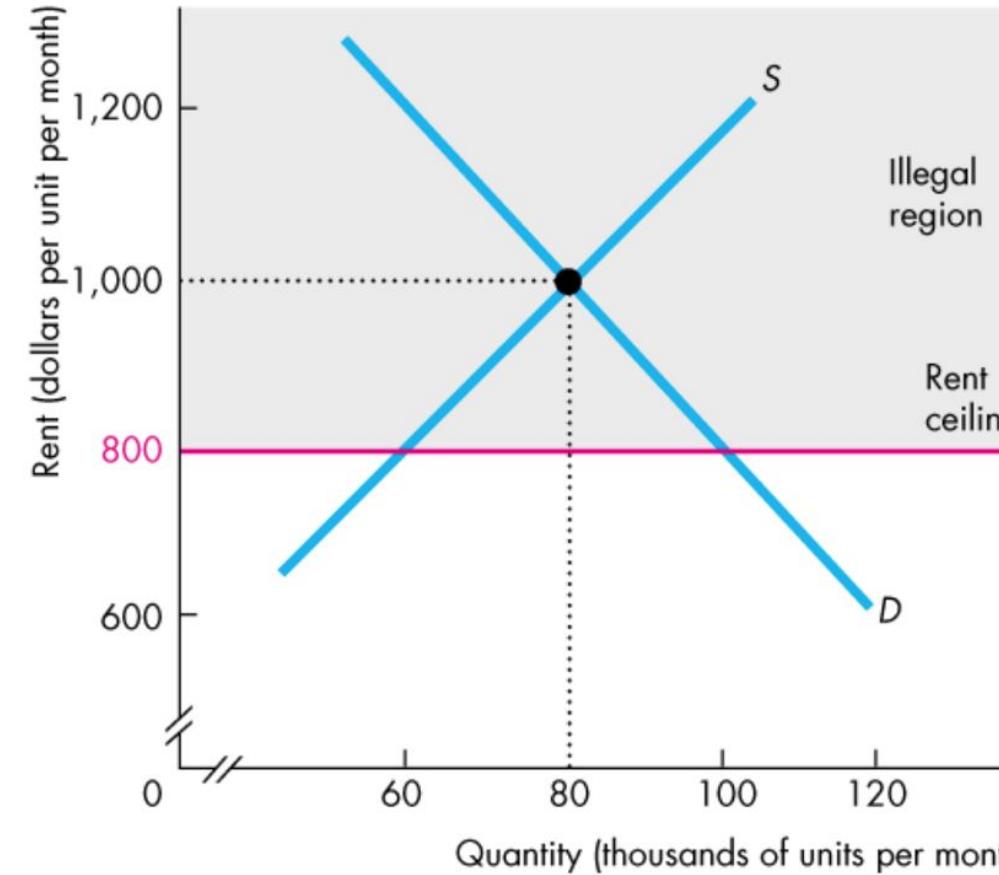
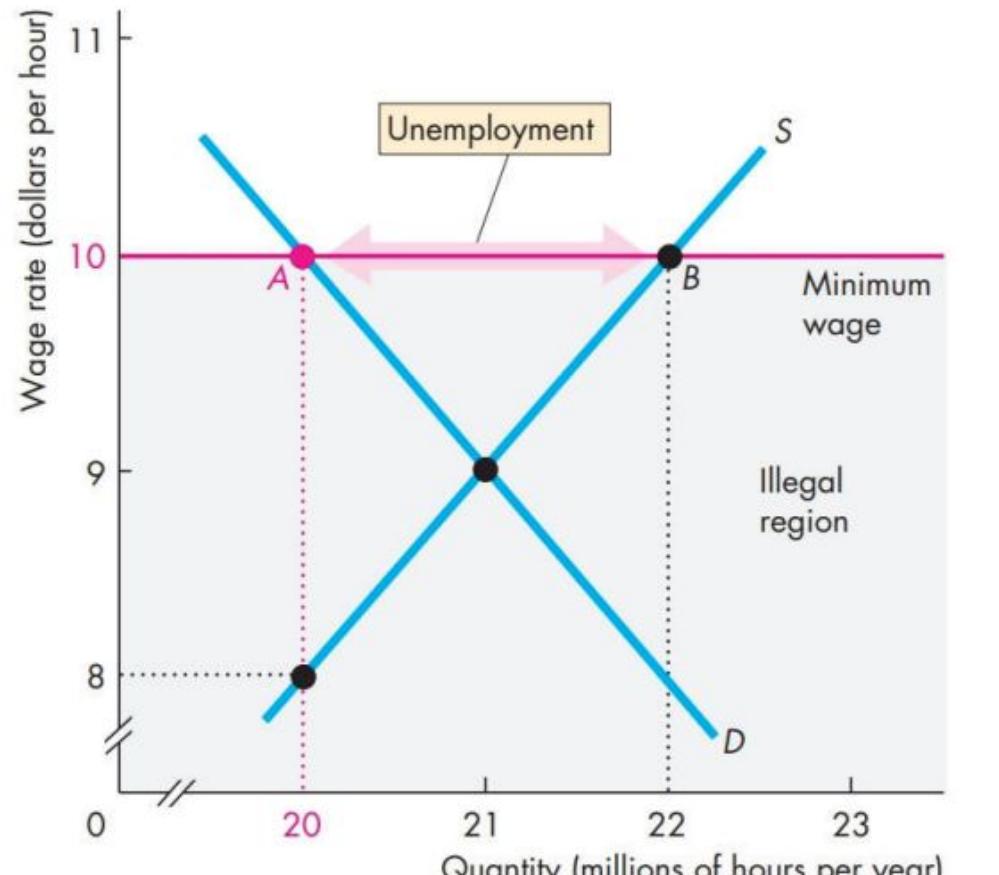
4. Global Market in Action - Tariffs on Imports

No Trade	Export Subsidy
<ul style="list-style-type: none"> - market is in EQM  <p>A supply and demand graph with Price (P) on the vertical axis and Quantity (Q) on the horizontal axis. The demand curve (D) slopes downward from left to right, and the supply curve (S) slopes upward from left to right. They intersect at the equilibrium point (4, 8). The vertical axis has tick marks at 2, 8, and 14. The horizontal axis has a tick mark at 4. A label $P_{sub} = \\$7$ is shown near the intersection point.</p>	<ul style="list-style-type: none"> - export subsidy: when the government sponsors the domestic producer of the exported good - S-subsidy is the new supply curve - Eg. the government implements \$2 subsidy per unit of the good  <p>A supply and demand graph with Price (P) on the vertical axis and Quantity (Q) on the horizontal axis. The demand curve (D) is the same as in the first graph. A new supply curve, labeled S_{-sub}, is parallel to the original supply curve (S) and shifted to the right. The new equilibrium is at the intersection of D and S_{-sub}, indicated by a blue dot at approximately (4.667, 7). A red arrow labeled $-\\$2$ points downwards from the original supply curve S towards the new supply curve S_{-sub}. The vertical axis has tick marks at 2, 8, and 14. The horizontal axis has a tick mark at 4.667 labeled Q_{sub}.</p>

domestic producers gain, overproduction in domestic economy, underproduction in the rest of the world



5. Government Actions in Market - Price Ceiling, Price Floor

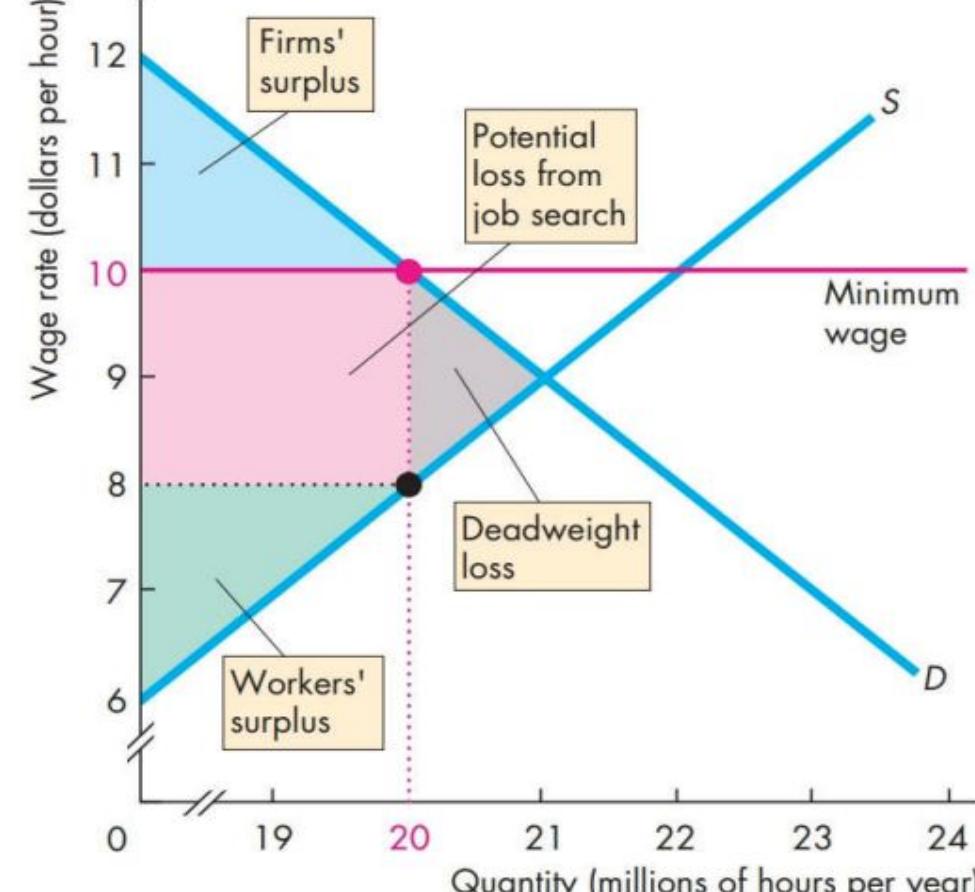
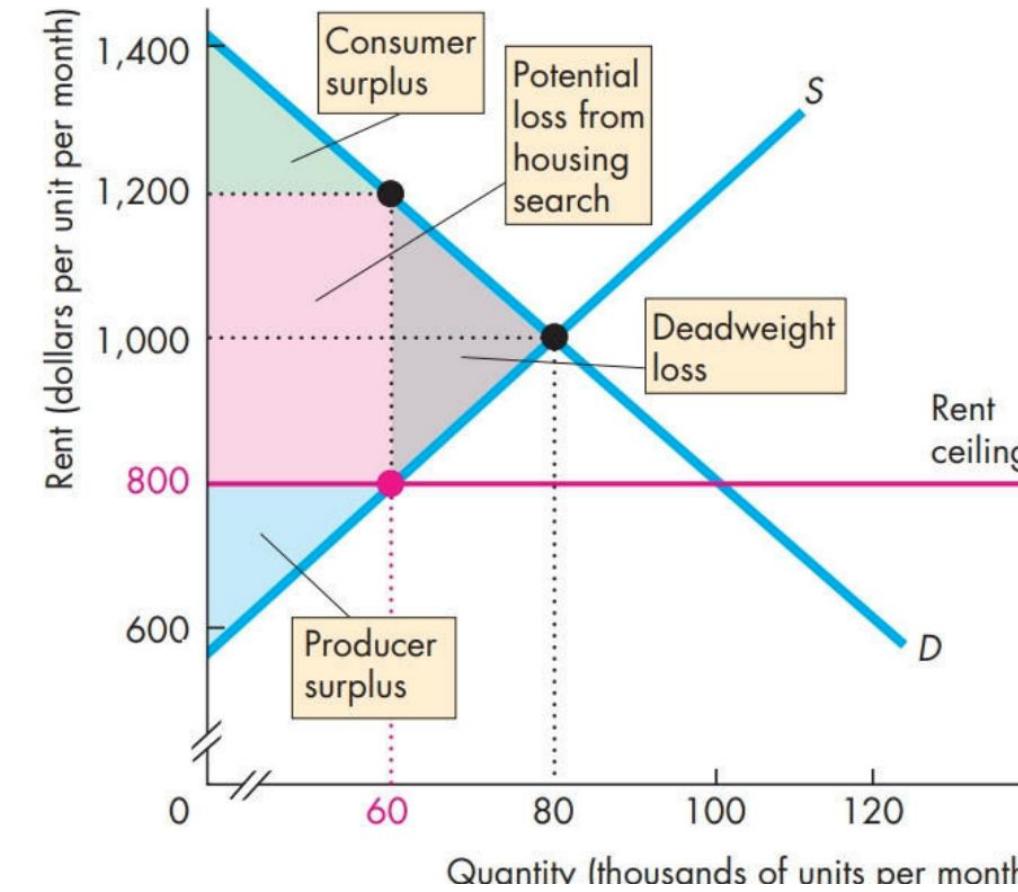
Price Ceiling	Price Floor
<ul style="list-style-type: none"> - Price ceiling: illegal to charge above a certain price - Price ceiling $< P^*$ - $D > S \rightarrow$ shortages \rightarrow underproduction - Eg. Rent market  <p>A supply and demand graph for the rent market. The vertical axis is labeled 'Rent (dollars per unit per month)' with values 0, 600, 800, 1,000, and 1,200. The horizontal axis is labeled 'Quantity (thousands of units per month)' with values 0, 60, 80, 100, and 120. A downward-sloping demand curve (D) and an upward-sloping supply curve (S) intersect at a price of \$1,000. A horizontal pink line at \$800 represents the price ceiling. At this price, the demand is 80 thousand units and the supply is 100 thousand units, creating a shortage of 20 thousand units. The area above the price ceiling is shaded gray and labeled 'Illegal region'.</p>	<ul style="list-style-type: none"> - Price floor: illegal to charge below a certain price - Price floor $> P^*$ - $S > D \rightarrow$ surplus \rightarrow underproduction - Eg. Labour market  <p>A supply and demand graph for the labour market. The vertical axis is labeled 'Wage rate (dollars per hour)' with values 8, 9, 10, and 11. The horizontal axis is labeled 'Quantity (millions of hours per year)' with values 0, 20, 21, 22, and 23. A downward-sloping demand curve (D) and an upward-sloping supply curve (S) intersect at a wage of \$10. A horizontal pink line at \$10 represents the minimum wage. At this wage, the demand is 21 million hours and the supply is 22 million hours, creating a surplus of 1 million hours (unemployment). The area below the price floor is shaded gray and labeled 'Illegal region'.</p>

both consumers and producers lose



5. Government Actions in Market - Price Ceiling, Price Floor

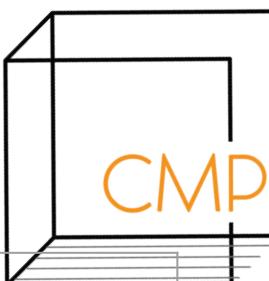
Price Ceiling	Price Floor
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both consumers and producers lose



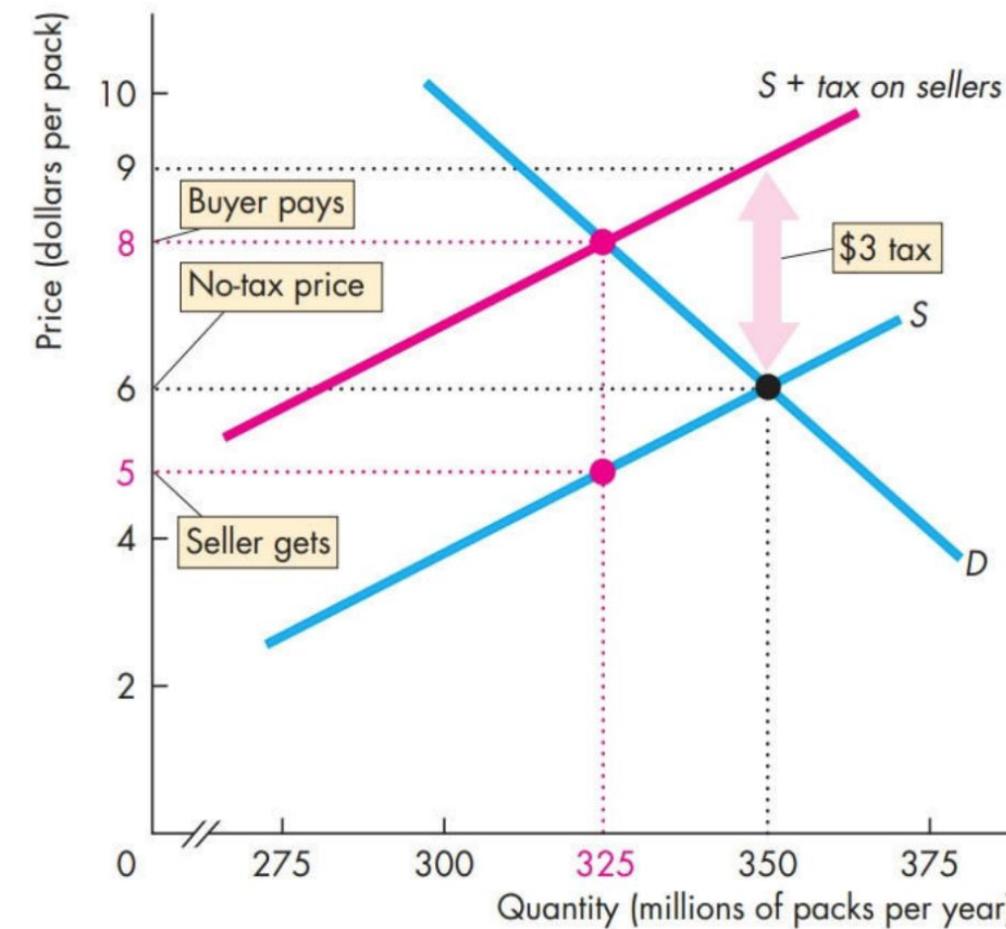
5. Government Actions in Market - Taxes



Tax incidence: division of the burden of a tax between the seller and buyer

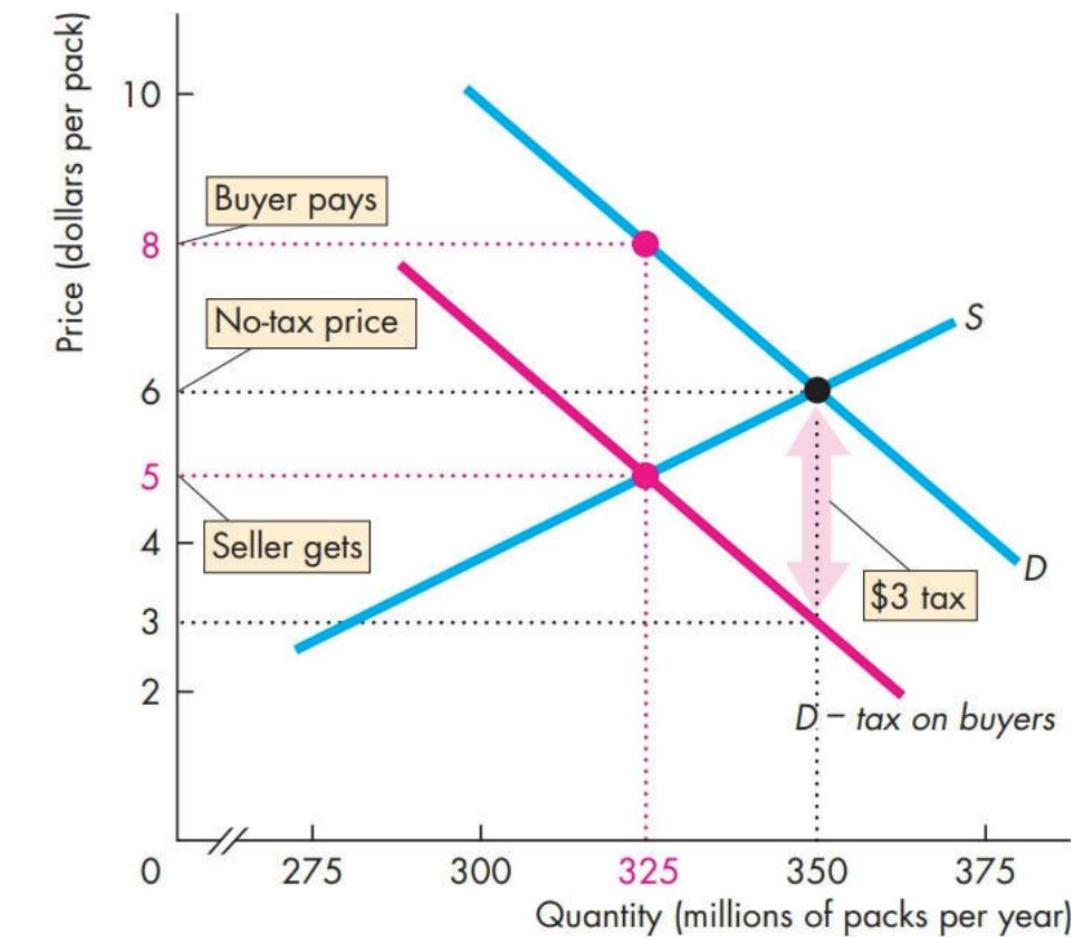
Tax on seller

- costs rise → supply curve shifts to $S + \text{tax}$ on sellers



Tax on buyer

- the amount the buyer is willing to pay the seller decreases → demand curve shifts to $D - \text{tax}$ on buyers



both consumers and producers lose

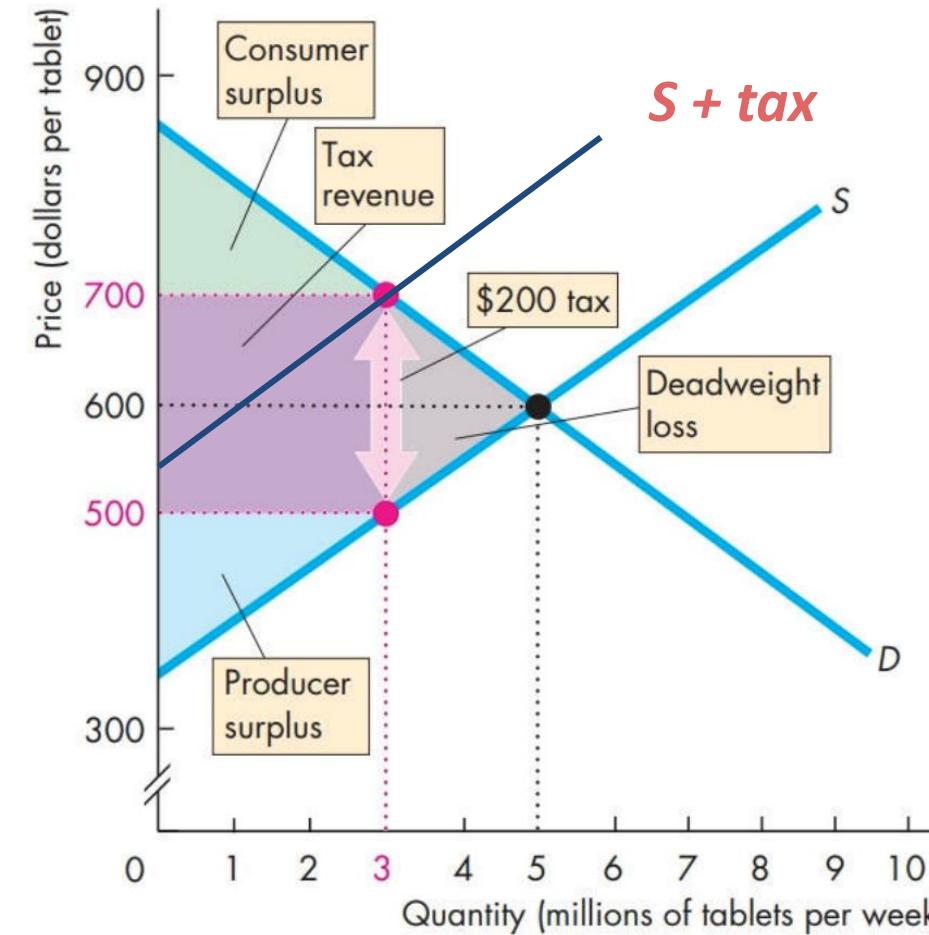


5. Government Actions in Market - Taxes

Tax incidence: division of the burden of a tax between the seller and buyer

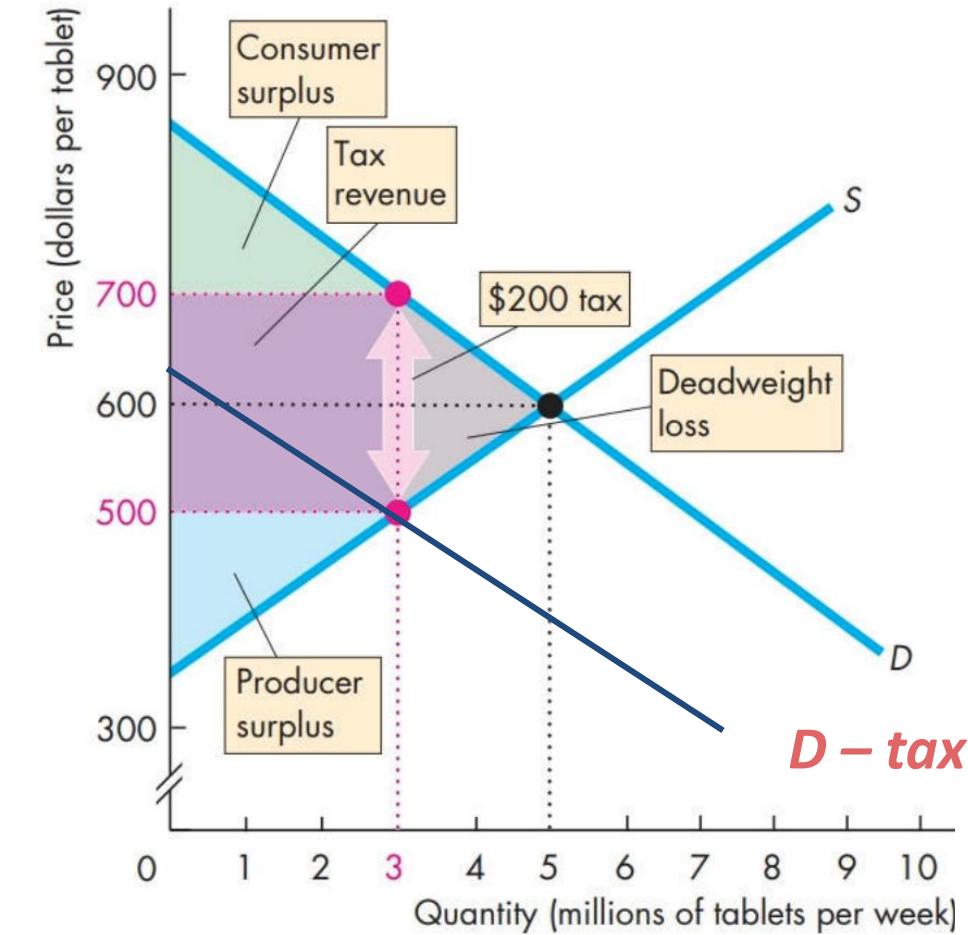
Tax on seller

- costs rise → supply curve shifts to ***S + tax*** on sellers



Tax on buyer

- the amount the buyer is willing to pay the seller decreases → demand curve shifts to ***D - tax*** on buyers



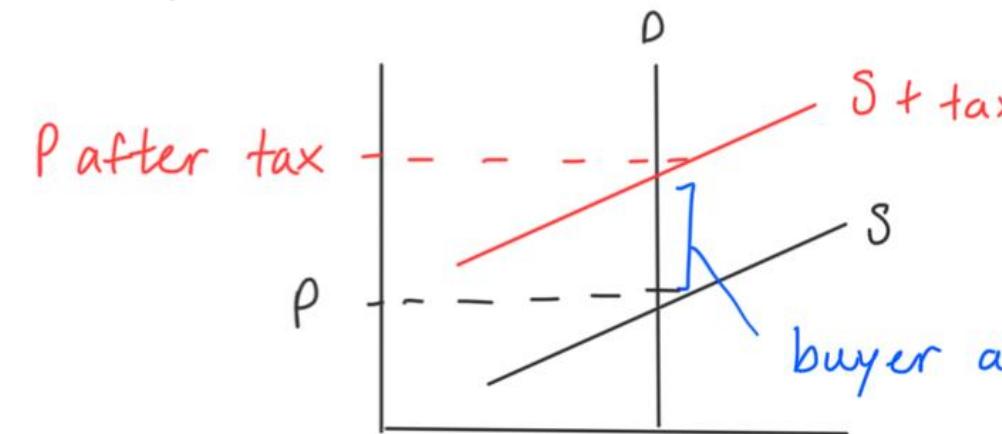
both consumers and producers lose



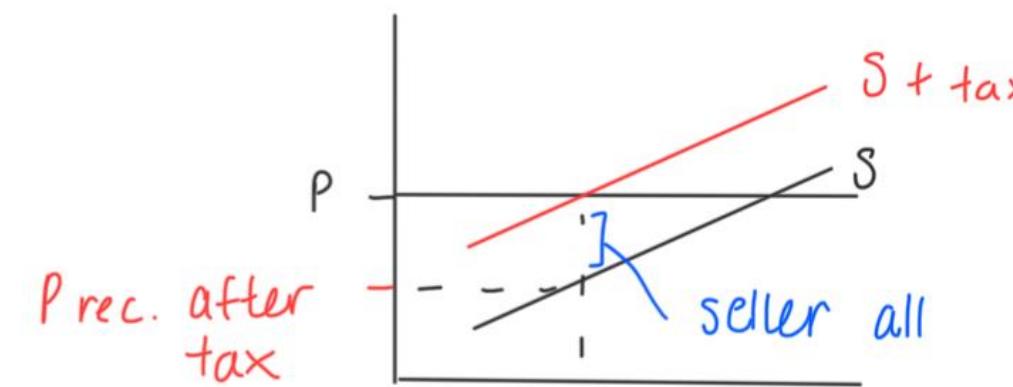
5. Government Actions in Market - Taxes

The more inelastic D is, the higher the buyer's share of taxes

1) Perfectly Inel. D :

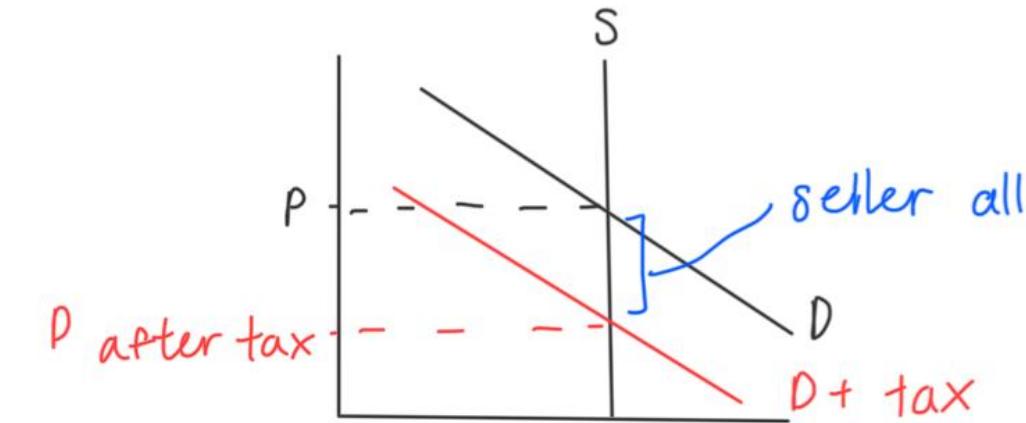


2) Perfectly El. D :

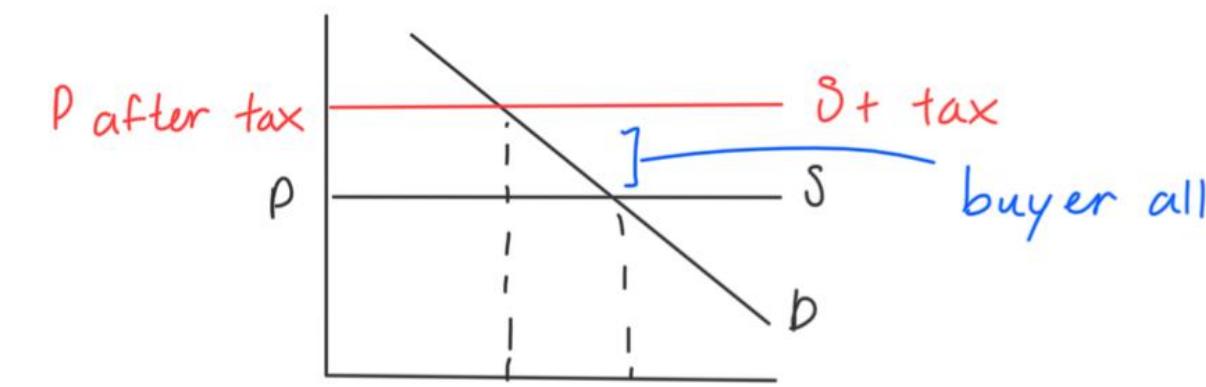


The more inelastic S is, the higher the seller's share of taxes

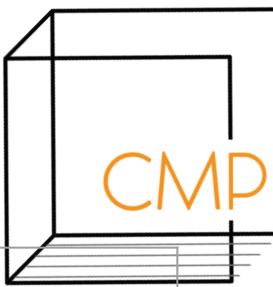
3) Perfectly Inel. S :



4) Perfectly El. S :

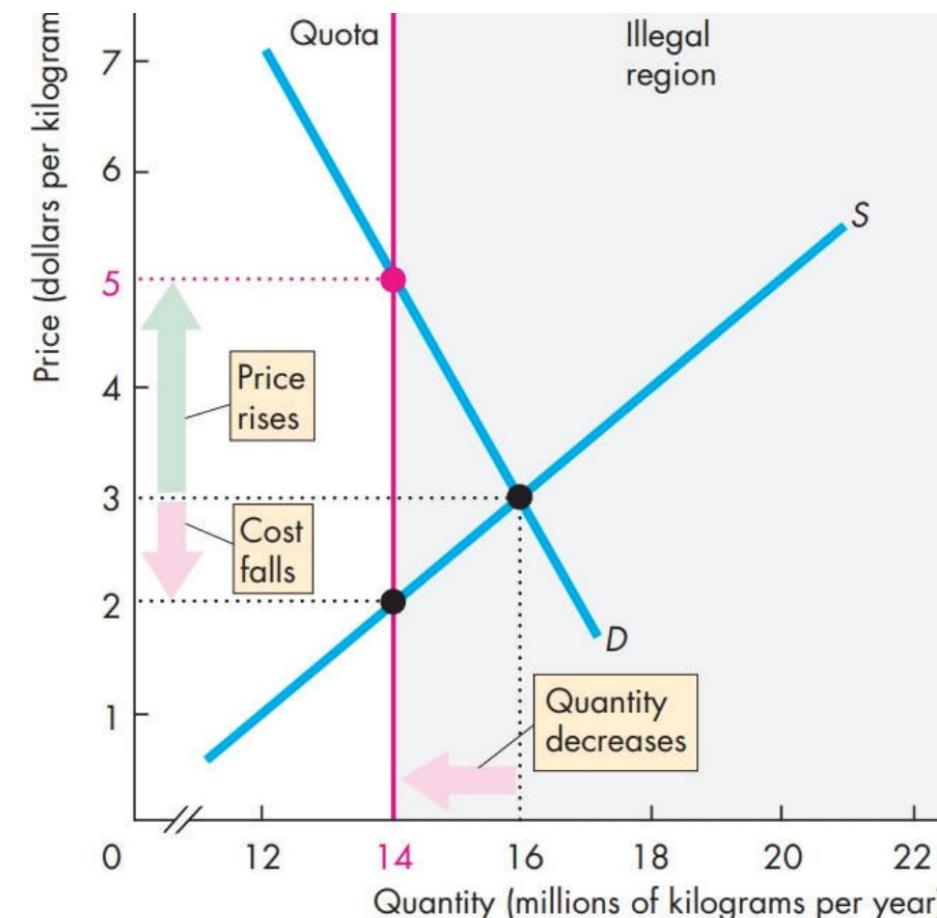


5. Government Actions in Market - Production Quota, Subsidy



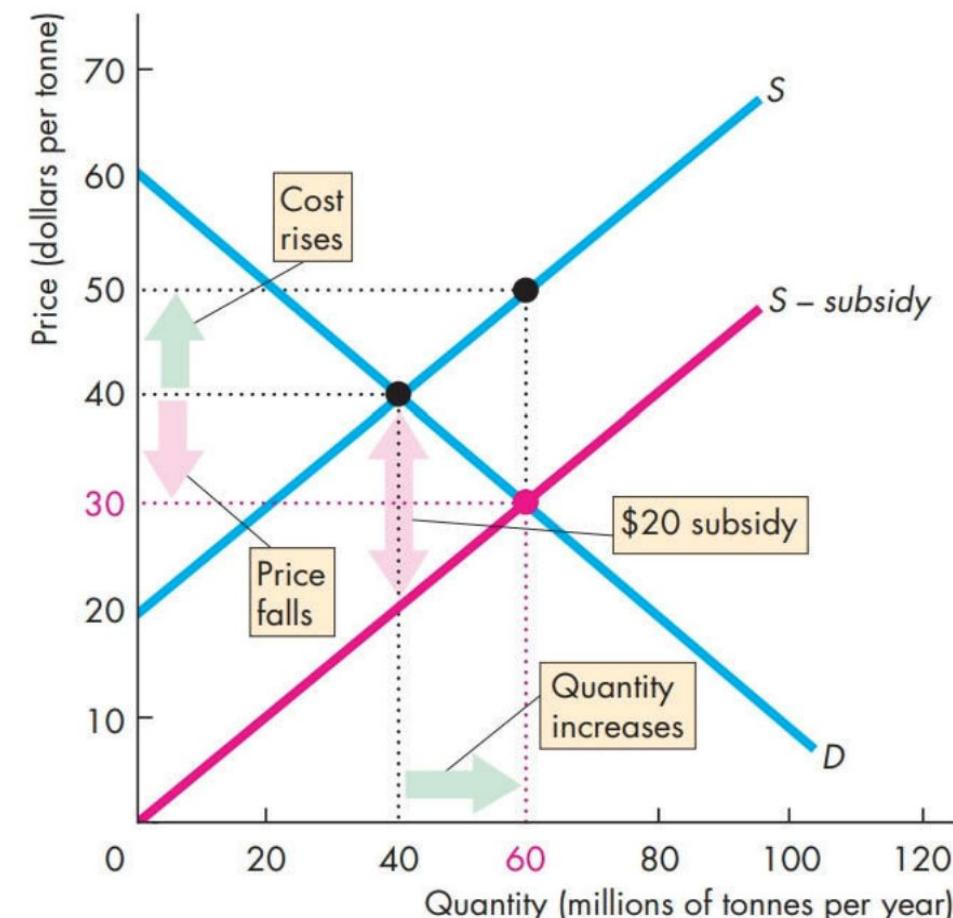
Production Quota

- **production quota:** limits how much can be produced
- Production quota $< Q^*$
- increases P, decreases Q \rightarrow underproduction
- eg. cigarette market



Subsidy

- **subsidy:** government sponsors production
- costs decrease \rightarrow supply curve shifts to *S – subsidy*
- decreases P, increases Q \rightarrow overproduction
- eg. milk market



both consumers and producers lose

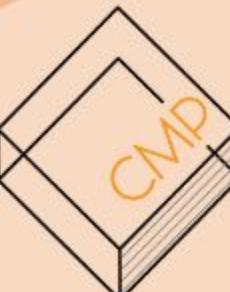
both consumers and producers gain



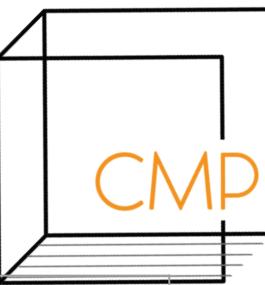
Break Time!



We hope you have been enjoying the review session so far! When you have a chance, please fill out our survey. We appreciate your feedback. You can be entered to win a \$20 giftcard of your choice!



6. Output & Cost



Short Run (SR)

- **short run (SR):** time frame where the quantities of 1 or more resources used in production is fixed
- eg. plant is fixed in SR, but other resources (labour, raw material) can change
- decisions are reversible
- can only increase output by increasing labour

Long Run (LR)

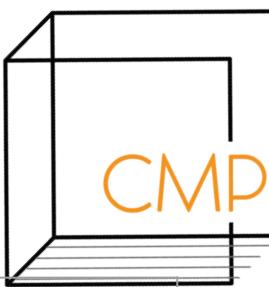
- **long run (LR):** time frame where the quantities of ALL resources used in production can vary
- decisions are irreversible
- can increase output by increasing labour &/or plant
- **sunk cost:** cost that incurred and can't be changed, so it's irrelevant to a firm's decision-making process
 - eg. cost of plant with no resale value is a sunk cost

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Knitting machines				
	1	2	3	4

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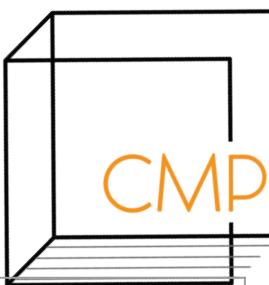
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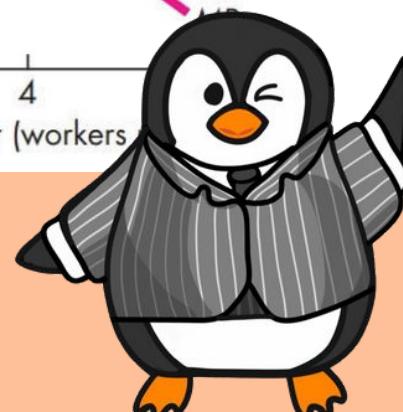
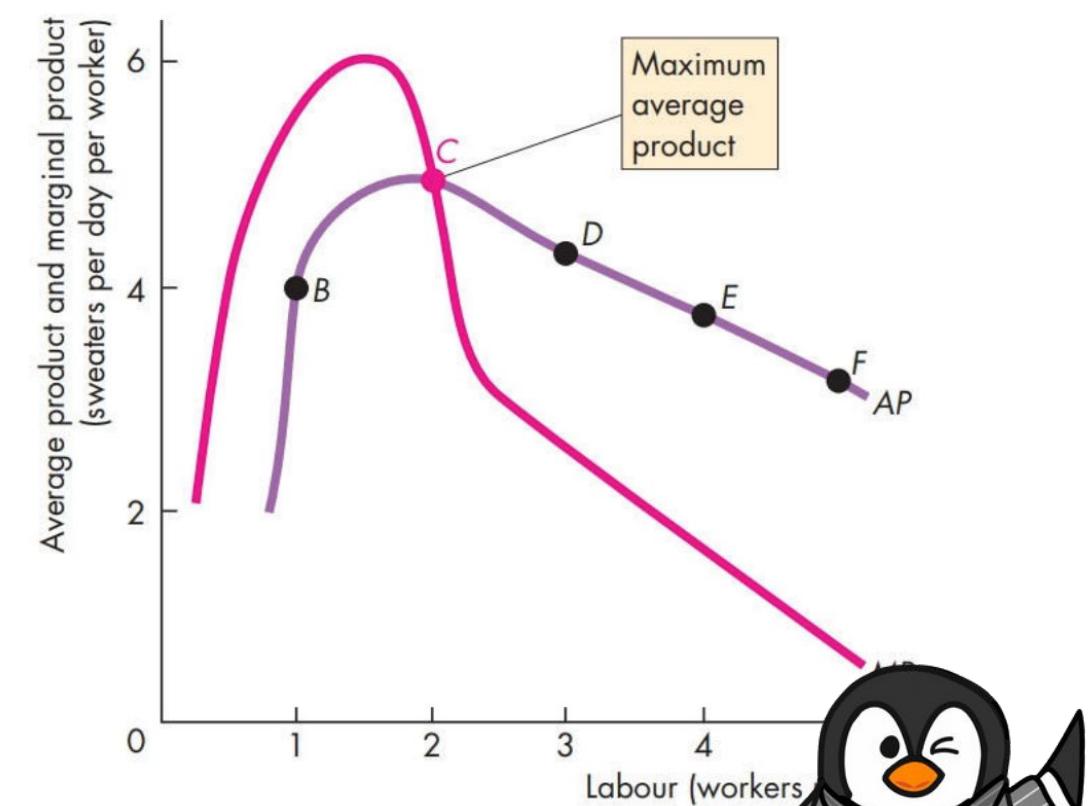
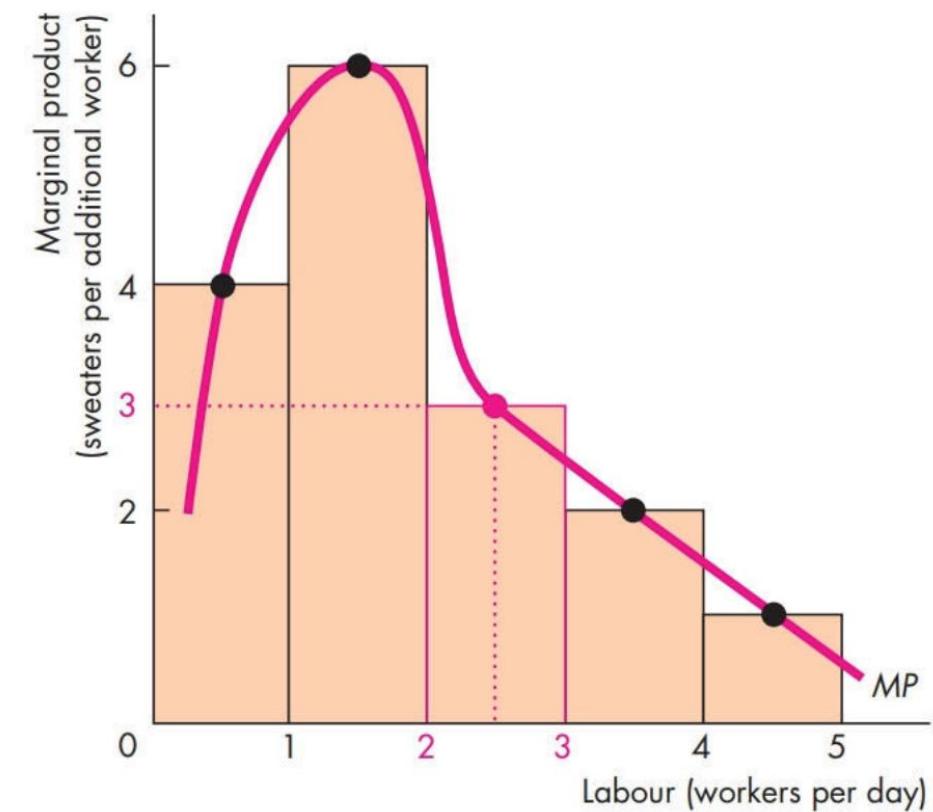
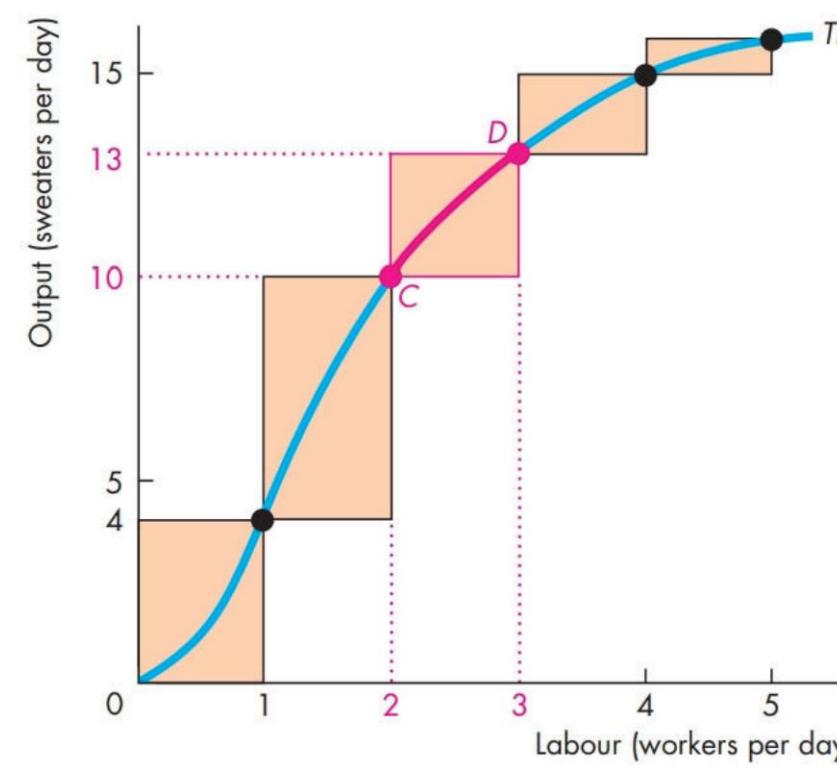
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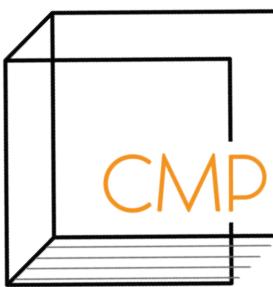


6. Output & Costs - Product Curves



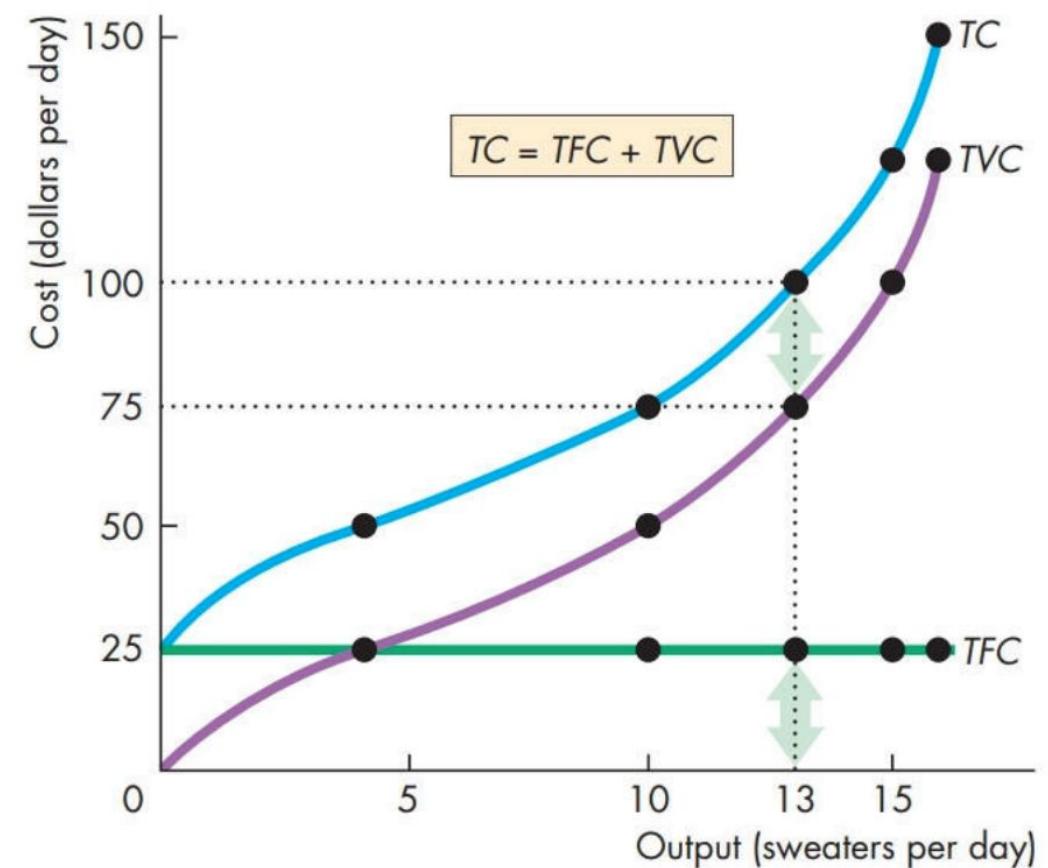
Total Product (TP)	Marginal Product (MP)	Average Product (AP)
<ul style="list-style-type: none"> - TP: total output produced - increases quickly at first, eventually slows down 	<ul style="list-style-type: none"> - MP: how much output changes with 1 more unit of labour - increasing marginal returns: MP of the next worker > MP of the previous - decreasing marginal returns: MP of the next worker < MP of the previous - law of diminishing returns: MP eventually decreases as we use more variable input with fixed input 	<ul style="list-style-type: none"> - AP: TP / # of units of labour
		<ul style="list-style-type: none"> - MP > AP → AP increases - MP < AP → AP decreases - MP = AP → AP is at maximum

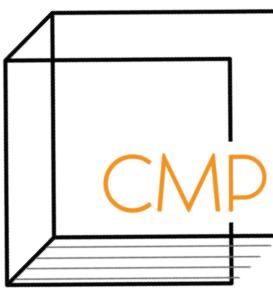




6. Output & Costs - TC, TFC, TVC Curves

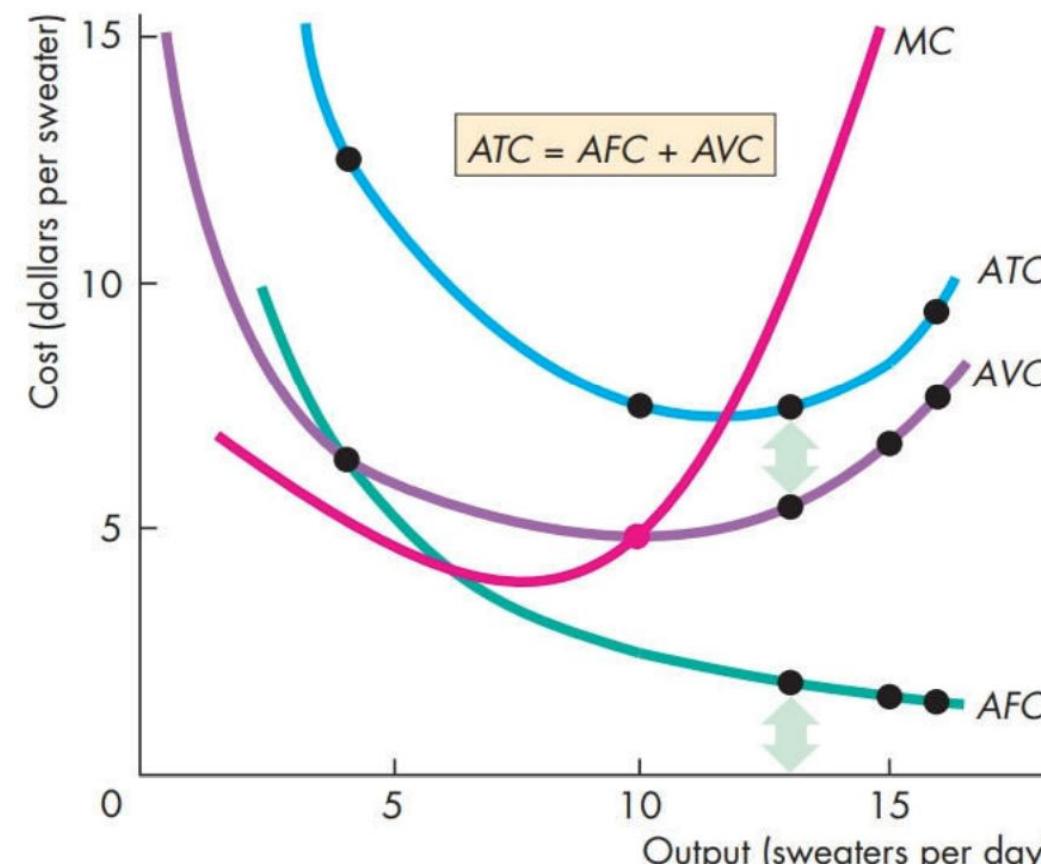
Total Fixed Cost (TFC)	Total Variable Cost (TVC)	Total Cost (TC)
<ul style="list-style-type: none"> - TVC: cost of fixed inputs - horizontal, straight line - <u>constant</u> because fixed input is fixed 	<ul style="list-style-type: none"> - TVC: cost of variable inputs - at low output levels: TVC is <u>flat</u> because MC is decreasing - at high output levels: TVC is <u>steep</u> because MC is increasing 	<ul style="list-style-type: none"> - $TC = TFC + TVC$ - a TVC curve that's shifted up by the value of TFC





8. Output & Costs - ATC, AFC, AVC, MC Curves

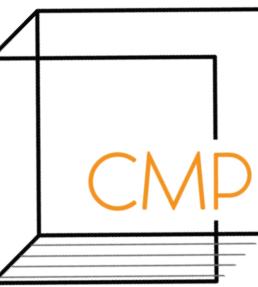
Average Total Fixed Cost (AFC)	Average Total Variable Cost (AVC)	Average Total Cost (ATC)	Marginal Cost (MC)
<ul style="list-style-type: none"> - $ATC = TFC / Q$ 	<ul style="list-style-type: none"> - $AVC = TVC / Q$ 	<ul style="list-style-type: none"> - $ATC = TC / Q$ or $ATC = AFC + AVC$ 	<ul style="list-style-type: none"> - MC: the change in TC when TP increases by 1
<ul style="list-style-type: none"> - decreases as output increases 	<ul style="list-style-type: none"> - U-shaped 	<ul style="list-style-type: none"> - U-shaped - distance between ATC & AVC is AFC (shortens because ATC is decreasing) 	<ul style="list-style-type: none"> - decreases until a certain point before it begins increasing



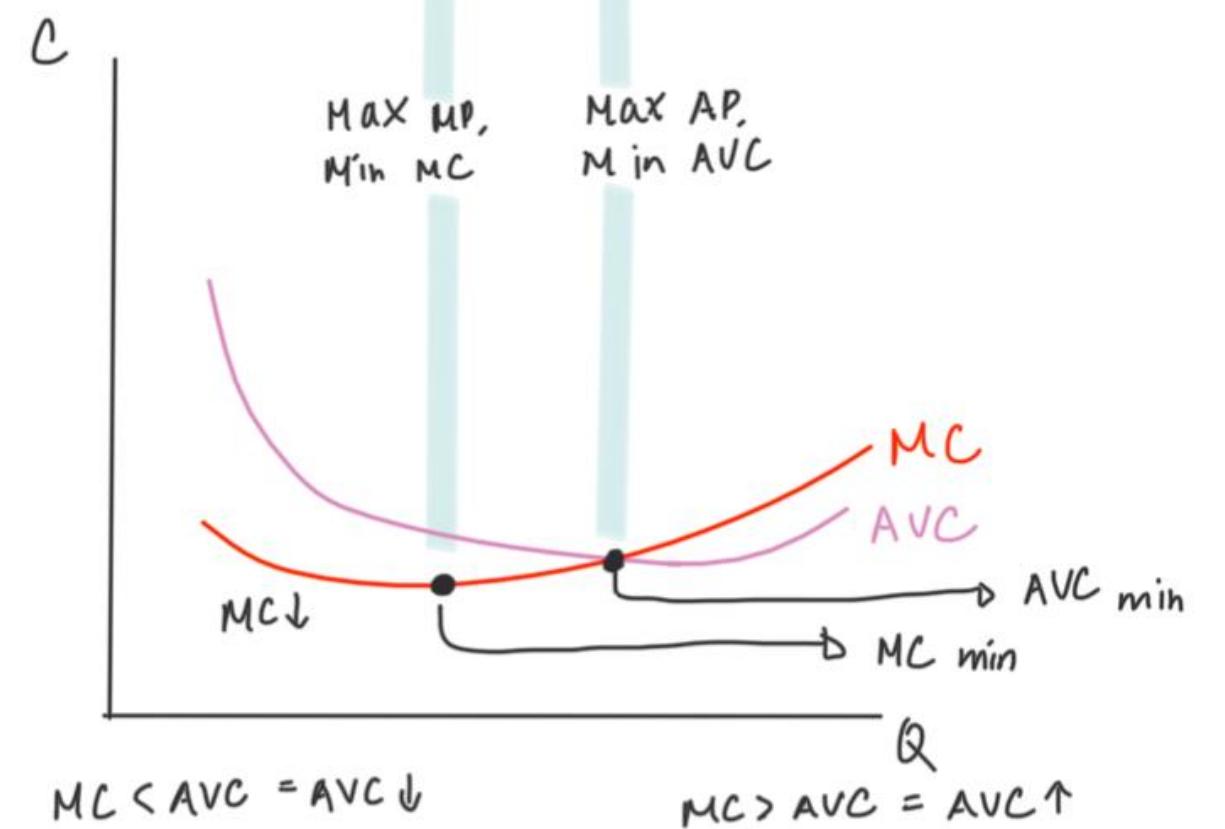
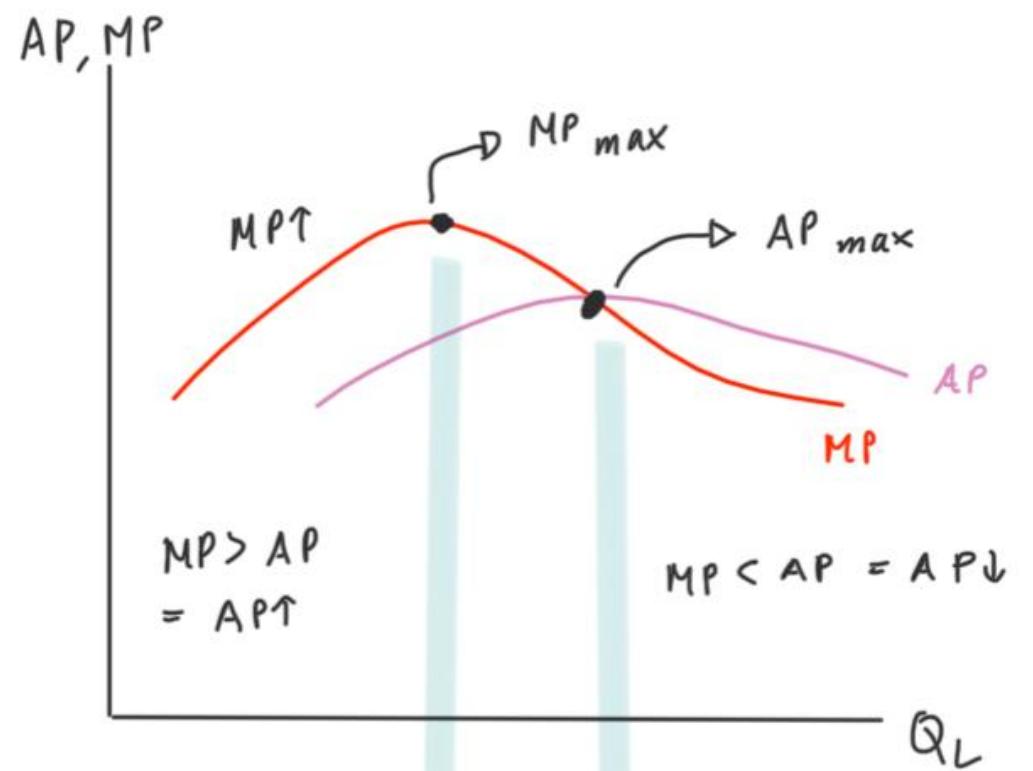
- MC is below AVC/ATC → AVC/ATC is decreasing
- MC is above AVC/ATC → AVC/ATC is increasing
- $MC = AVC/ATC \rightarrow AVC/ATC$ is at minimum



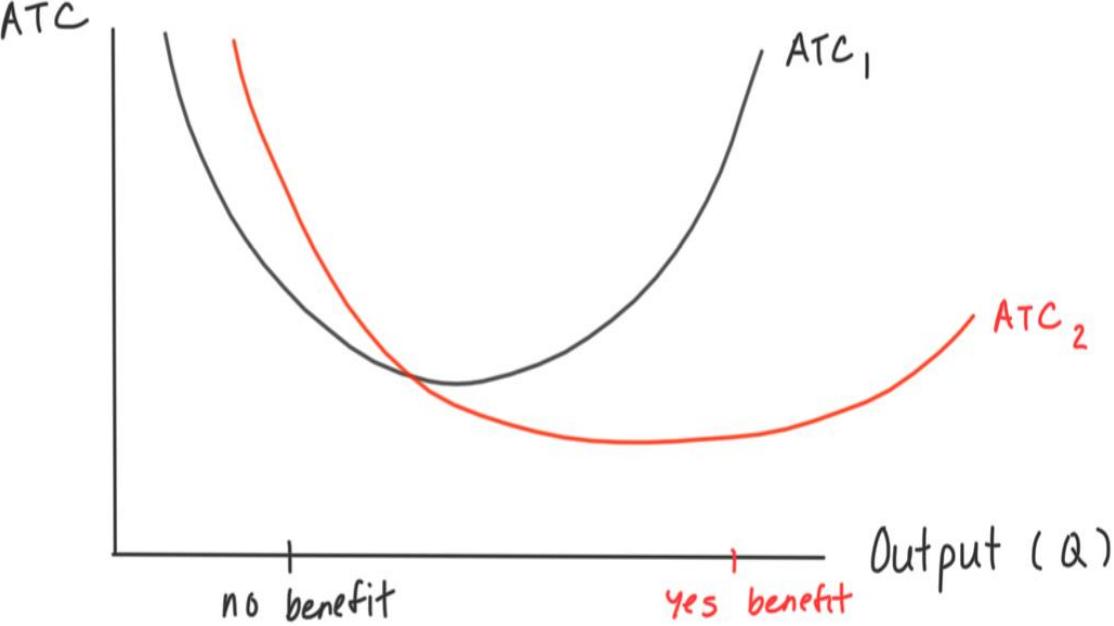
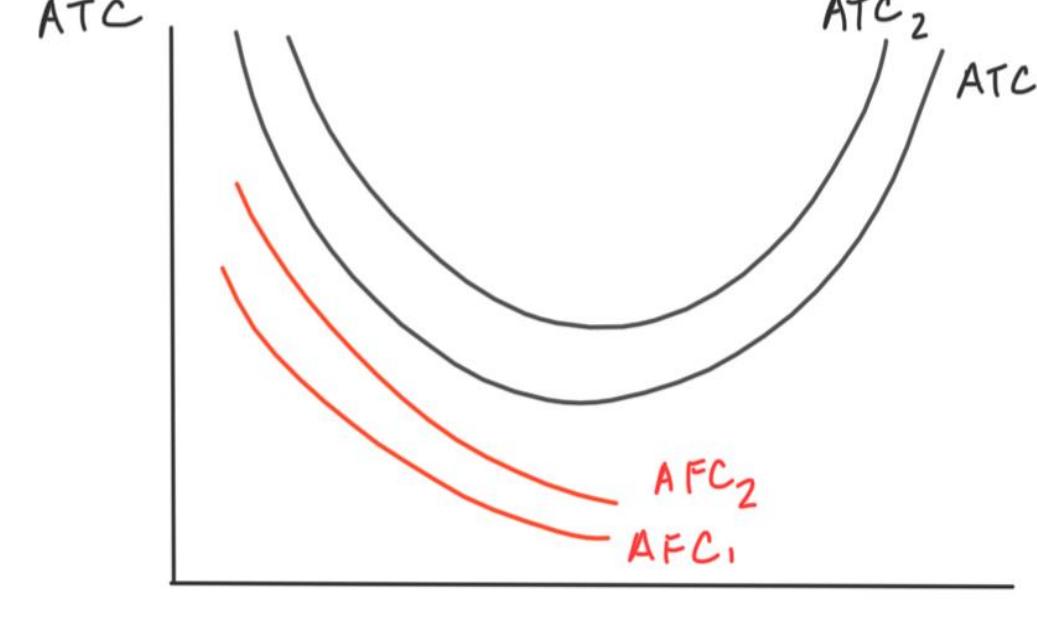
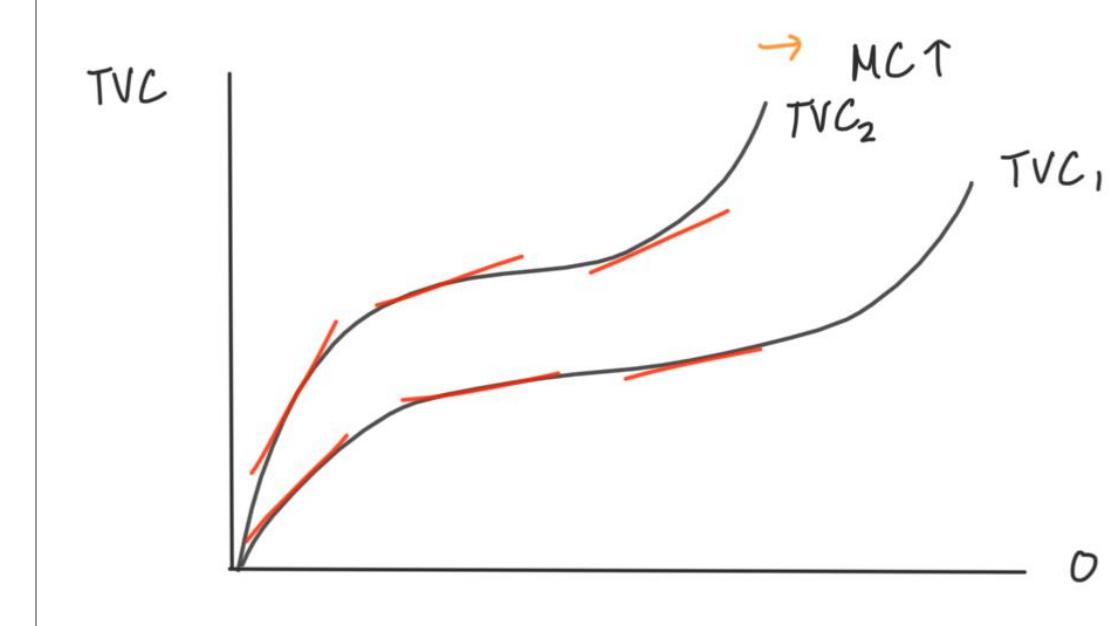
8. Output & Costs - MP-AC vs. AP-AVC Curves



- MP is at max \rightarrow MC is at min
- AP is at max \rightarrow AVC is at min

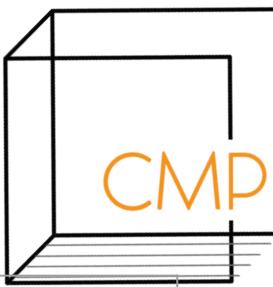


6. Output & Costs - Shifts in Cost Curves

Technological Advancement	Price of Fixed Factors	Price of Variable Factors
<ul style="list-style-type: none"> - capital cost rises \rightarrow AFC rises but AVC drops - at low output levels: ATC is <u>high</u> - at high output levels: ATC is <u>low</u> 	<ul style="list-style-type: none"> - price of fixed factors rises \rightarrow TFC rises \rightarrow AFC rises \rightarrow ATC rises 	<ul style="list-style-type: none"> - price of variable factors rises \rightarrow TVC rises \rightarrow AVC rises \rightarrow ATC rises - steeper tangents means higher MC 



6. Output & Cost



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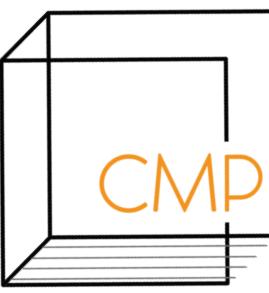
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Knitting machines					
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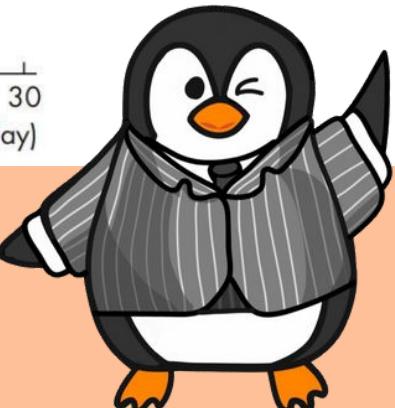
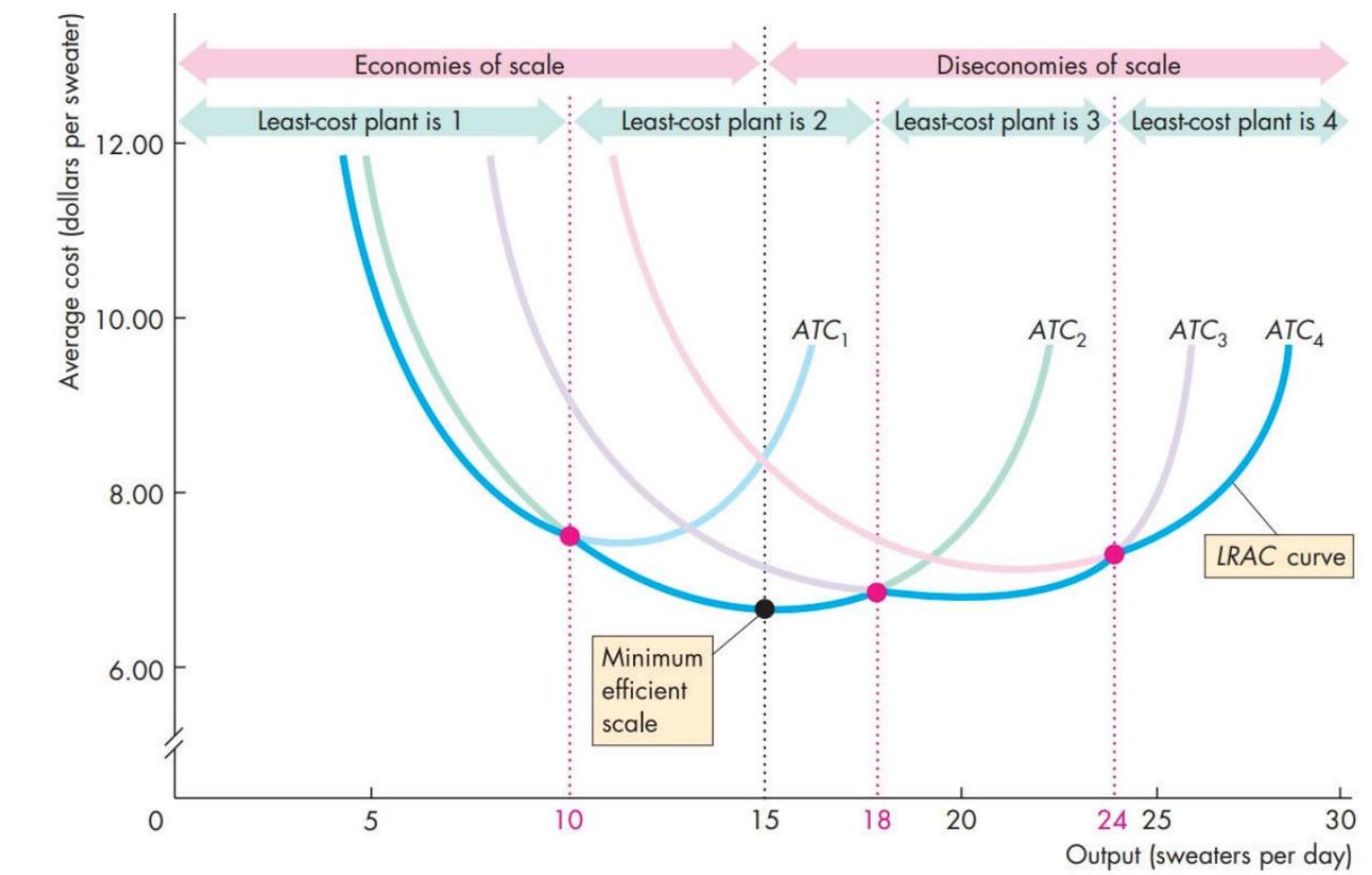
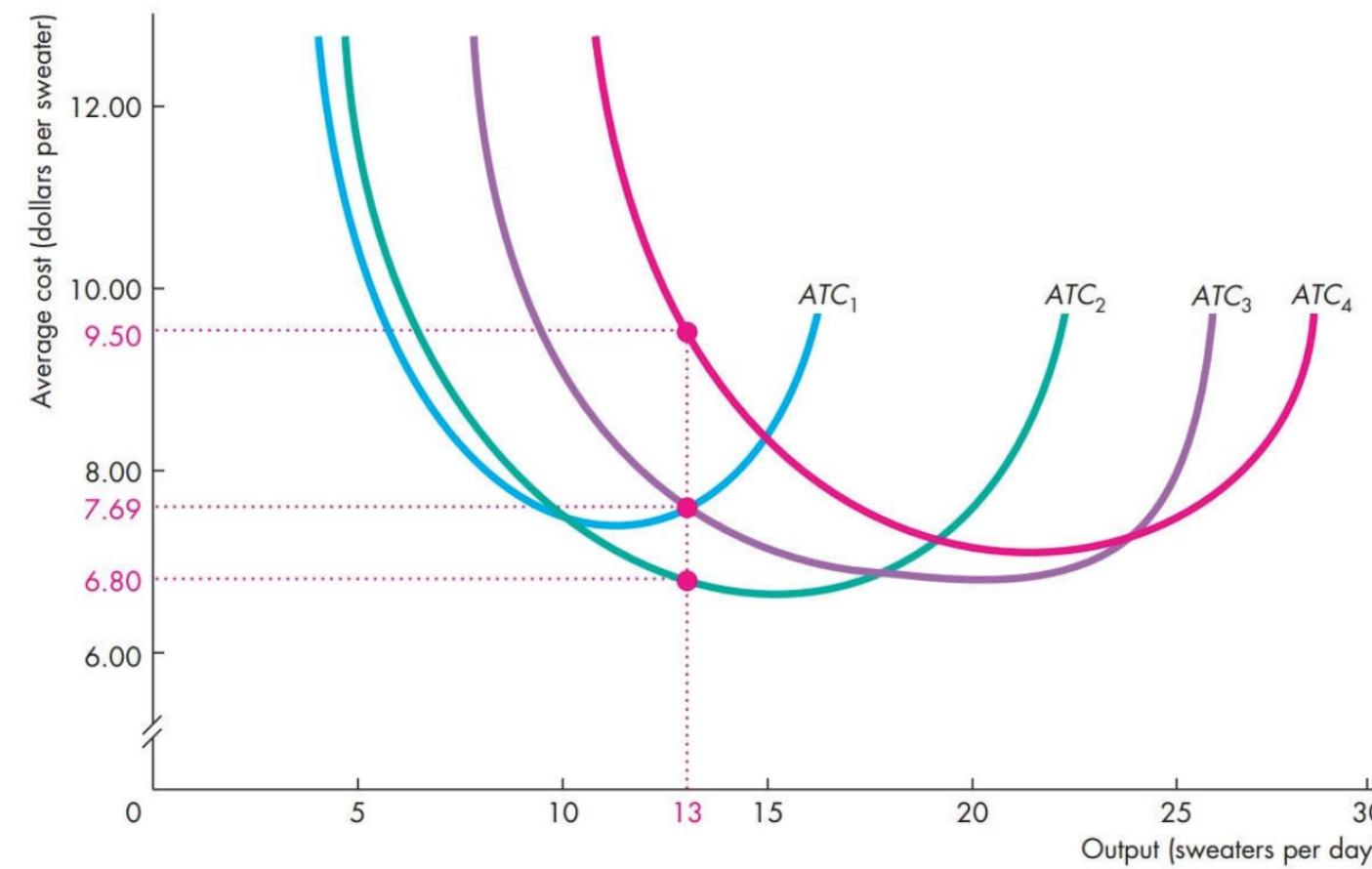
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Knitting machines					
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6. Output & Costs - LRAC

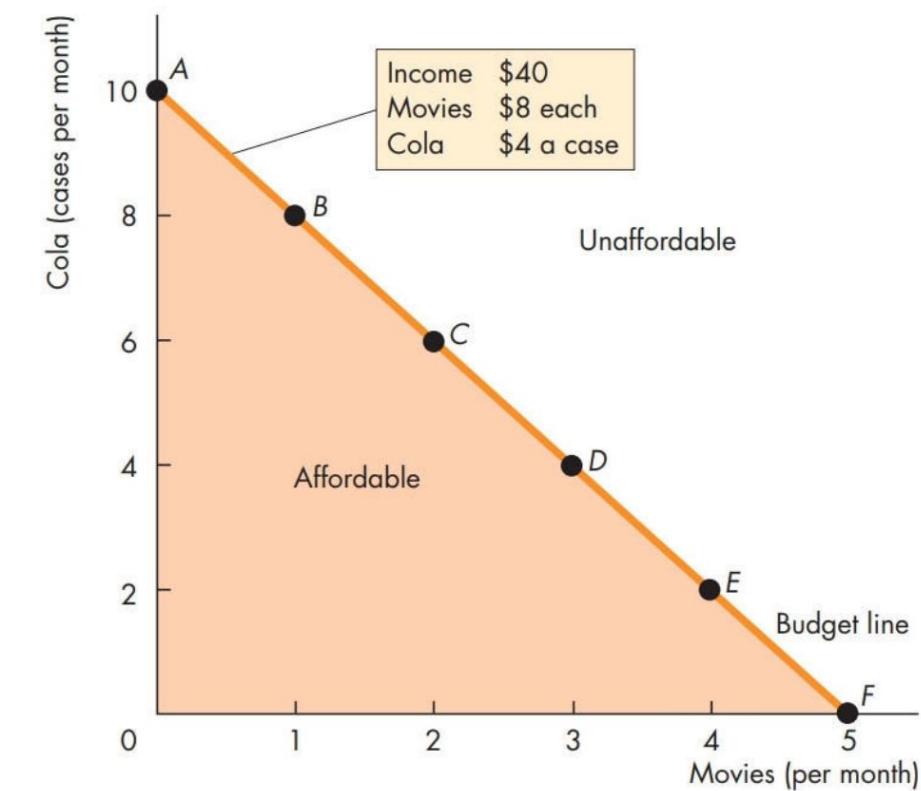
- **Long run average cost (LRAC) curve:** made up of the lowest ATC for each output level
- **economies of scale:** ATC decreases as output increases
- **diseconomies of scale:** ATC increases as output increases
- **constant returns to scale:** ATC is the same as output increases
- **minimum efficient scale:** lowest point on the LRAC curve



7. Utility & Demand - Consumption Possibilities

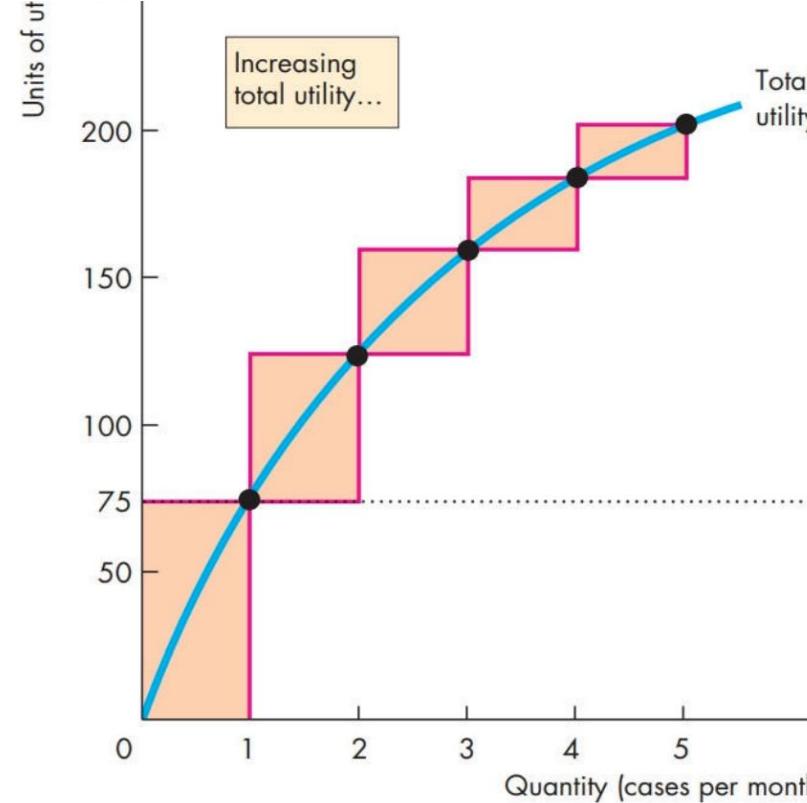
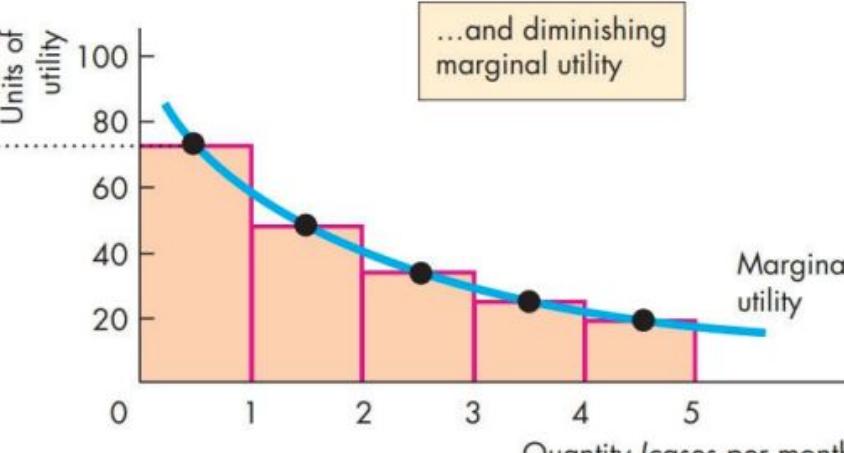
- **consumption possibilities:** all of the things that you can buy
 - limited by income and prices of the goods/services, so changes when they change
 - **budget line:** shows the boundary between the combinations of goods/services that a household can and can't afford to buy

Possibility	Quantity	Movies		Cola	
		Expenditure (dollars)	Cases	Expenditure (dollars)	Cases
A	0	0	10	40	
B	1	8	8	32	
C	2	16	6	24	
D	3	24	4	16	
E	4	32	2	8	
F	5	40	0	0	

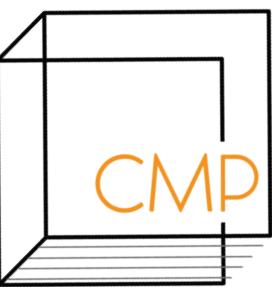


7. Utility & Demand - Utility

- **preferences:** consumer's likes and dislikes
- **utility:** benefit/ satisfaction a person gets from consuming goods/services

Total Utility (TU)	Marginal Utility (MU)																												
<p>- increases by less as consumption increases</p> <p>- eg. if you have ice cream everyday, you will feel less and less satisfied by it each time you have it (might even get sick of it!)</p>  <p>The graph illustrates Total Utility (TU) on the vertical axis and Quantity (cases per month) on the horizontal axis. A blue curve represents the total utility, which increases at a decreasing rate as quantity increases from 0 to 5 cases. The area under the curve is shaded in light orange. A text box states 'Increasing total utility...'. A horizontal dotted line extends from the point where quantity is 1 case up to the curve, and another dotted line extends from the point where quantity is 2 cases up to the curve.</p> <table border="1"> <thead> <tr> <th>Quantity (cases per month)</th> <th>Total Utility (TU)</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>75</td></tr> <tr><td>2</td><td>125</td></tr> <tr><td>3</td><td>160</td></tr> <tr><td>4</td><td>180</td></tr> <tr><td>5</td><td>200</td></tr> </tbody> </table>	Quantity (cases per month)	Total Utility (TU)	0	0	1	75	2	125	3	160	4	180	5	200	<p>- MU: how TU changes when 1 more unit of a good is consumed</p> <p>- diminishing marginal utility: MU decreases as consumption increases</p>  <p>The graph illustrates Marginal Utility (MU) on the vertical axis and Quantity (cases per month) on the horizontal axis. A blue curve represents the marginal utility, which starts at approximately 85 for 0 cases and decreases as quantity increases. The area under the curve is shaded in light orange. A text box states '...and diminishing marginal utility'. A horizontal dotted line extends from the point where quantity is 0 cases up to the curve, and another dotted line extends from the point where quantity is 1 case up to the curve.</p> <table border="1"> <thead> <tr> <th>Quantity (cases per month)</th> <th>Marginal Utility (MU)</th> </tr> </thead> <tbody> <tr><td>0</td><td>85</td></tr> <tr><td>1</td><td>75</td></tr> <tr><td>2</td><td>50</td></tr> <tr><td>3</td><td>35</td></tr> <tr><td>4</td><td>25</td></tr> <tr><td>5</td><td>20</td></tr> </tbody> </table>	Quantity (cases per month)	Marginal Utility (MU)	0	85	1	75	2	50	3	35	4	25	5	20
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7. Utility & Demand - Utility Maximizing Choice

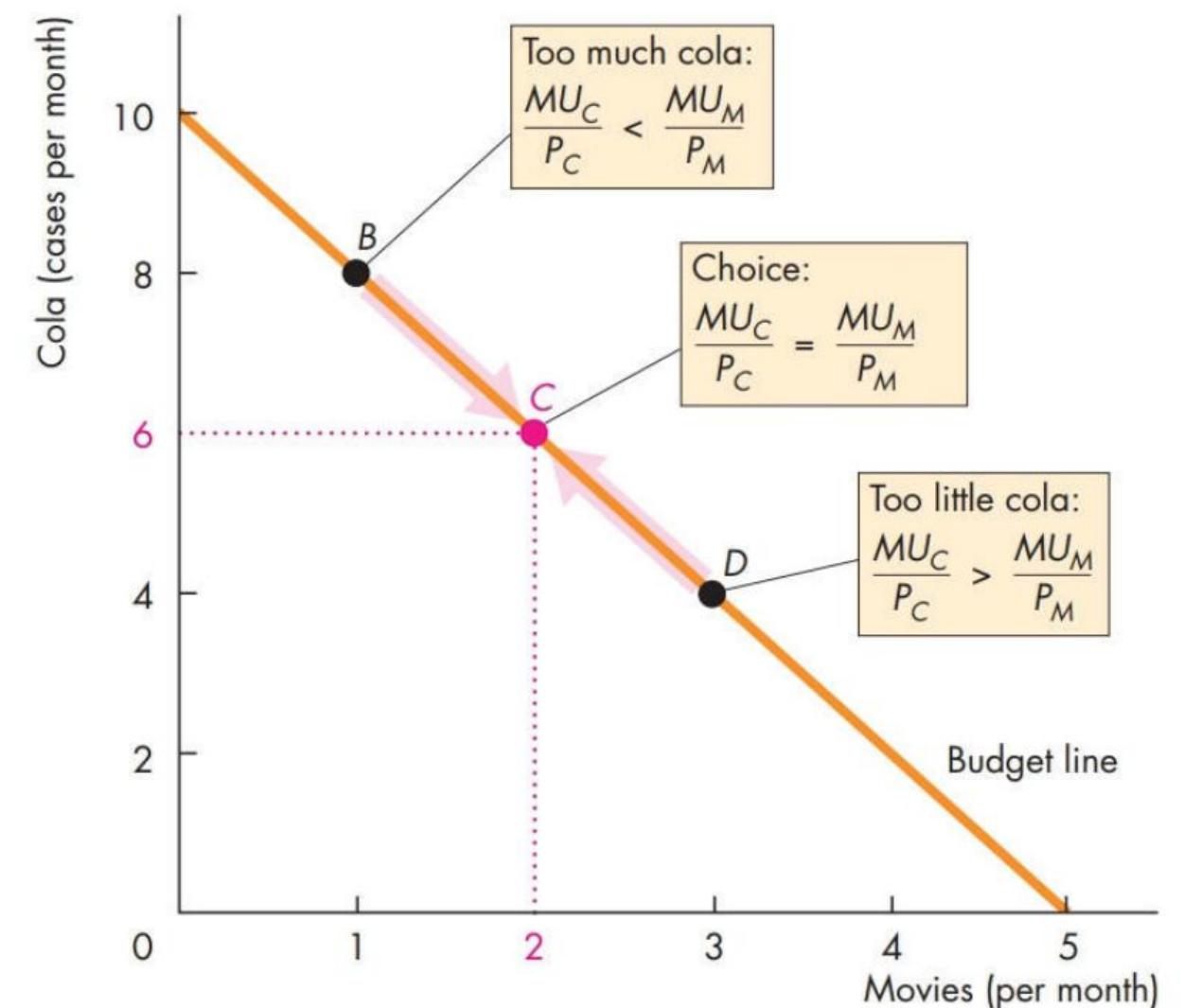
Find it Manually

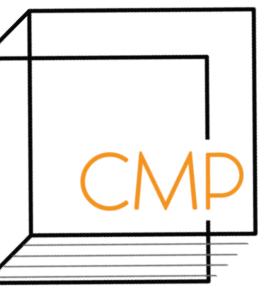
1. Find the Just-Affordable Combinations (shown by the budget line)
2. Find the TU for each Just-Affordable Combination
3. **Consumer EQM:** the Just-Affordable Combination with the highest TU

OR...

Find it by using Marginal Utility Per Dollar

- **marginal utility per dollar:** how TU changes when I spend 1 more dollar on the good/service
 - MU of the good/ Price of the good
- utility is maximized when:
 - all income is spent
 - $\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$



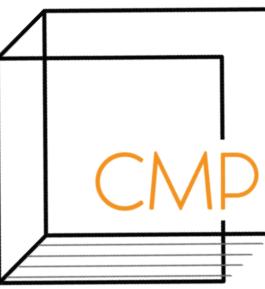


9. Utility & Demand - Real Income, Relative Price

- **real income:** income expressed as a quantity of goods that the household can afford to buy
 - real income = Y/P of a good
 - eg. if income is \$50 and a granola bar is \$2, the real income in terms of granola bars is 25 granola bars
- **relative price:** price of good 1/ price of good 2
 - eg. If a movie ticket is \$8 and a granola bar is \$2, the relative price of a granola bar is 4 movie tickets



9. Utility & Demand - Changes to the Budget Line

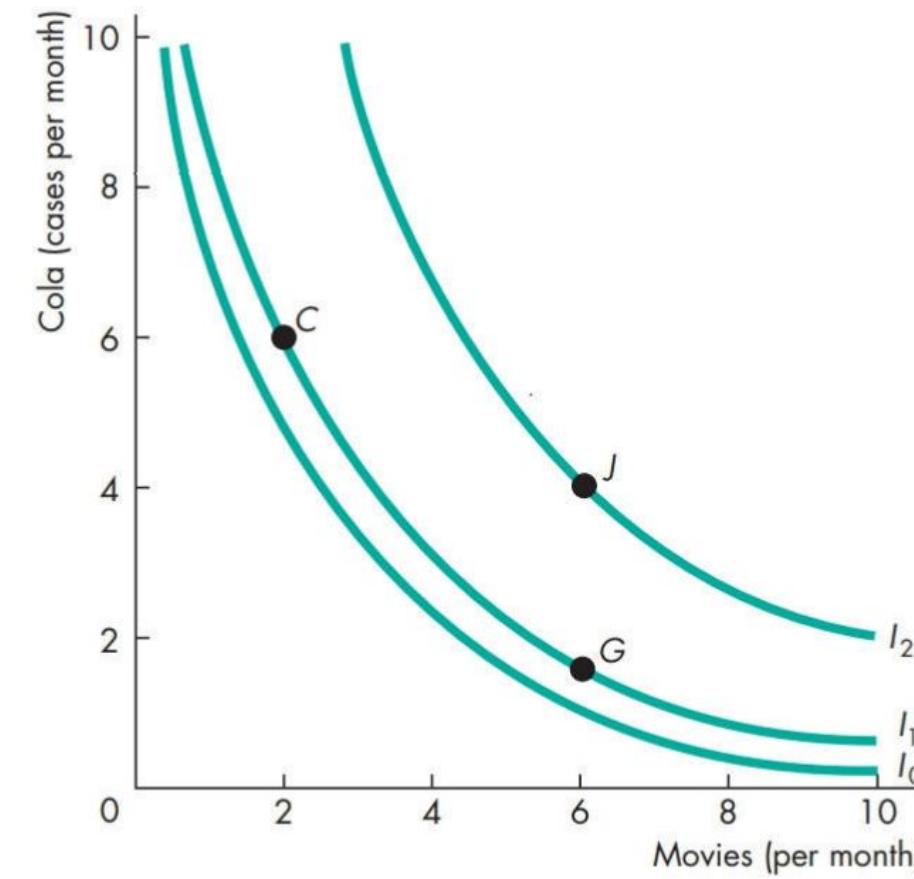
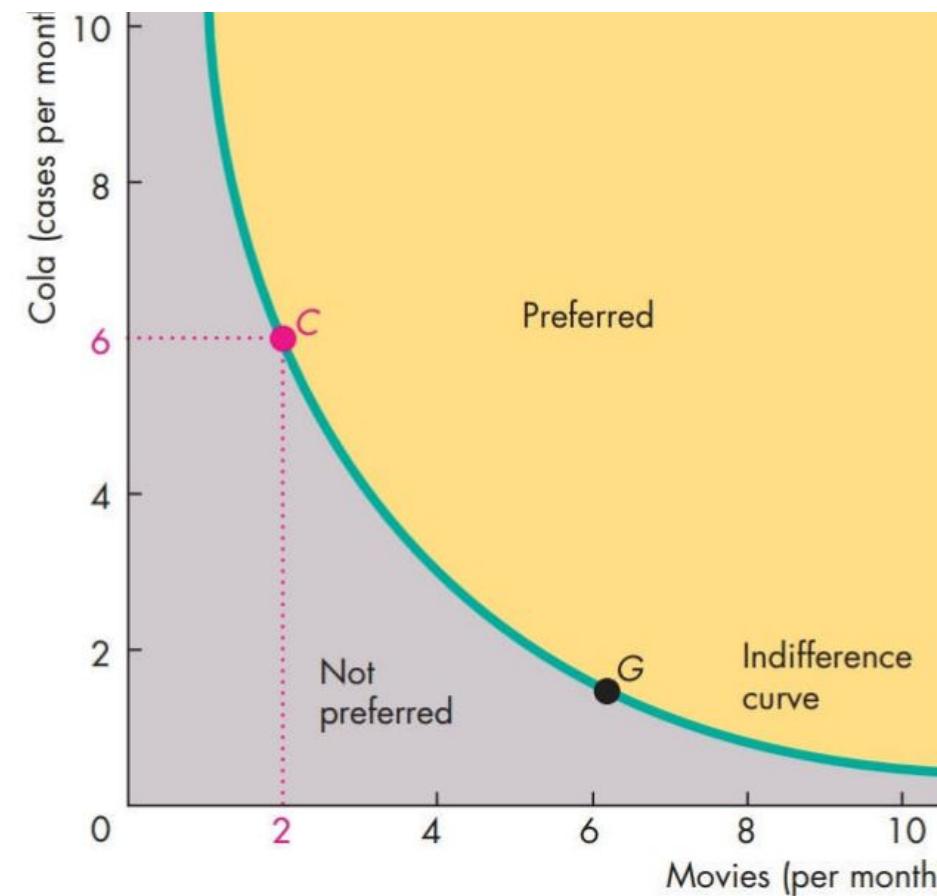


Changes in Prices	Changes in Income
<ul style="list-style-type: none"> - Price changes → relative price changes → slope changes - Price of the good on the x-axis drops → budget line flattens - Price of the good on the x-axis rises → budget line gets steeper 	<ul style="list-style-type: none"> - Income changes → real income changes → budget line shifts - income increases → budget line shifts right - income decreases → budget line shifts left



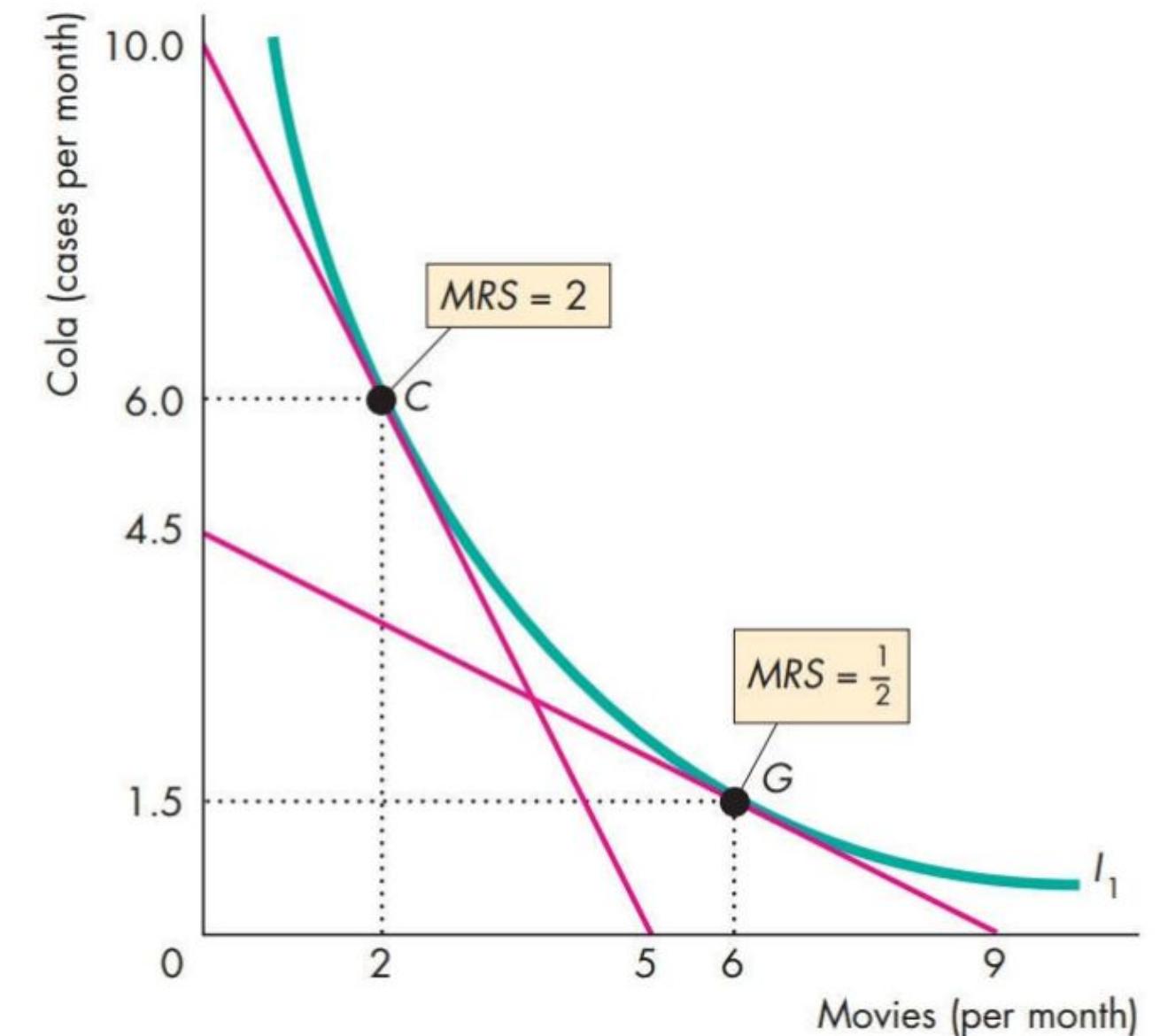
9. Utility & Demand - Preferences Map and Indifference Curves

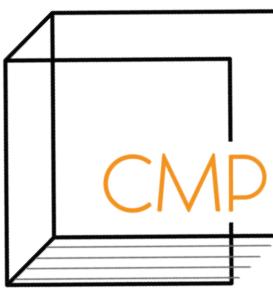
Indifference Curve	Preference Map
<ul style="list-style-type: none"> - Indifference curve: shows the combos of goods where the consumer is indifferent - order of preference: below indifference curve < indifference curve < above indifference curve 	<ul style="list-style-type: none"> - Preference map: shows multiple indifference curves - farther the budget line is from the origin, the more the consumer prefers it



9. Utility & Demand - Marginal Rate of Substitution

- **marginal rate of substitution (MRS):** rate at which a person is willing to give up good y to get an additional unit of good x, while remaining indifferent
 - steep indifference curve → MRS = high
 - flat indifference curve → MRS = low
- **diminishing marginal rate of substitution:** as the consumer gets more of good x, they will be less willing to give up good y for it while staying indifferent



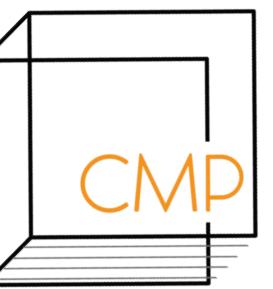


9. Utility & Demand - Degree of Substitutability

- **degree of substitutability:** how well a good can substitute for another good, affects the shape of the indifference curve

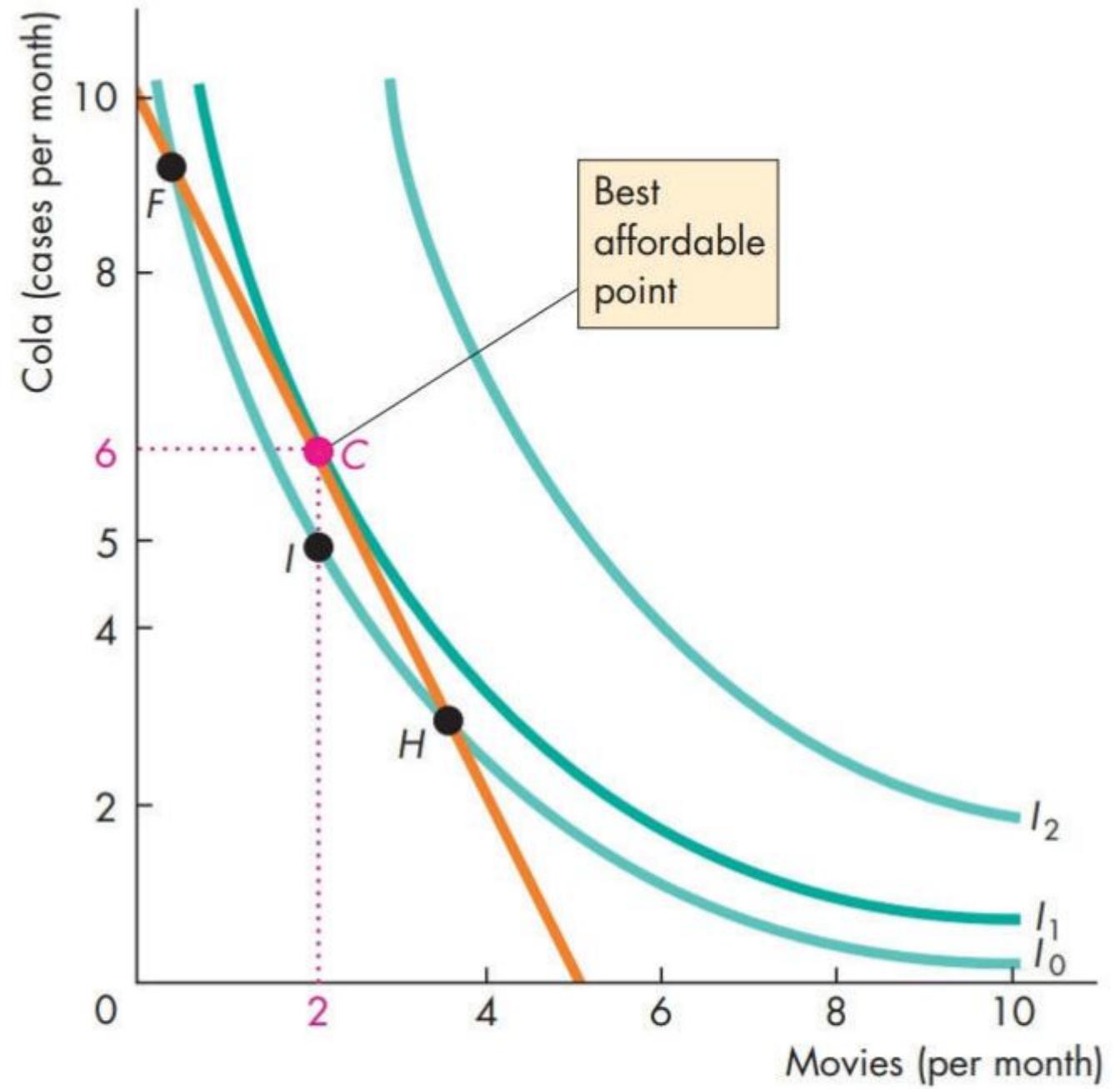
Ordinary Goods	Perfect Substitutes	Complements
<ul style="list-style-type: none"> - Ordinary goods: can substitute each other to a certain degree - eg. movie and coke 	<ul style="list-style-type: none"> - Perfect substitutes: can very easily substitute for one other - eg. pens from Superstore and pens from Walmart 	<ul style="list-style-type: none"> - Complements: can't replace each other at all - eg. left and right sneakers
<p>A graph showing indifference curves for ordinary goods. The vertical axis is labeled 'Cola (cans)' and ranges from 0 to 10. The horizontal axis is labeled 'Movies' and ranges from 0 to 10. Two convex indifference curves are shown, representing the trade-off between consuming more movies and more cans of cola.</p>	<p>A graph showing indifference curves for perfect substitutes. The vertical axis is labeled 'Marker pens at the local grocery store' and ranges from 0 to 10. The horizontal axis is labeled 'Marker pens at the campus bookstore' and ranges from 0 to 10. Two straight, parallel downward-sloping lines are shown, representing the perfect substitutability between two different types of marker pens.</p>	<p>A graph showing indifference curves for complements. The vertical axis is labeled 'Left running shoes' and ranges from 0 to 5. The horizontal axis is labeled 'Right running shoes' and ranges from 0 to 5. An L-shaped indifference curve is shown, representing the necessity of having both left and right shoes together.</p>

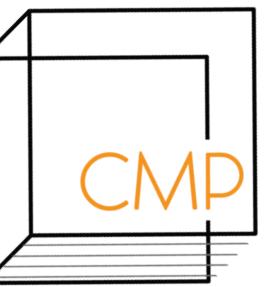




9. Utility & Demand - Best Affordable Choice

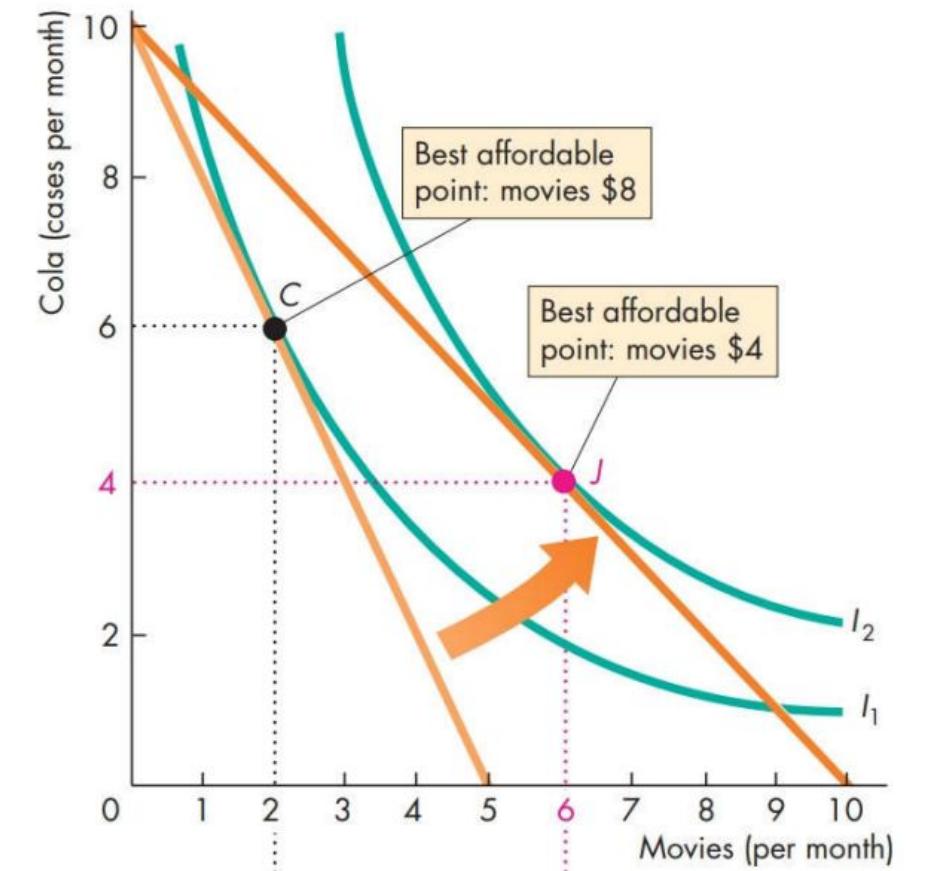
- **Characteristics of the best affordable choice:**
 - On the budget line (spent all of their income)
 - On the highest attainable indifference curve
 - MRS = the relative price of the 2 goods



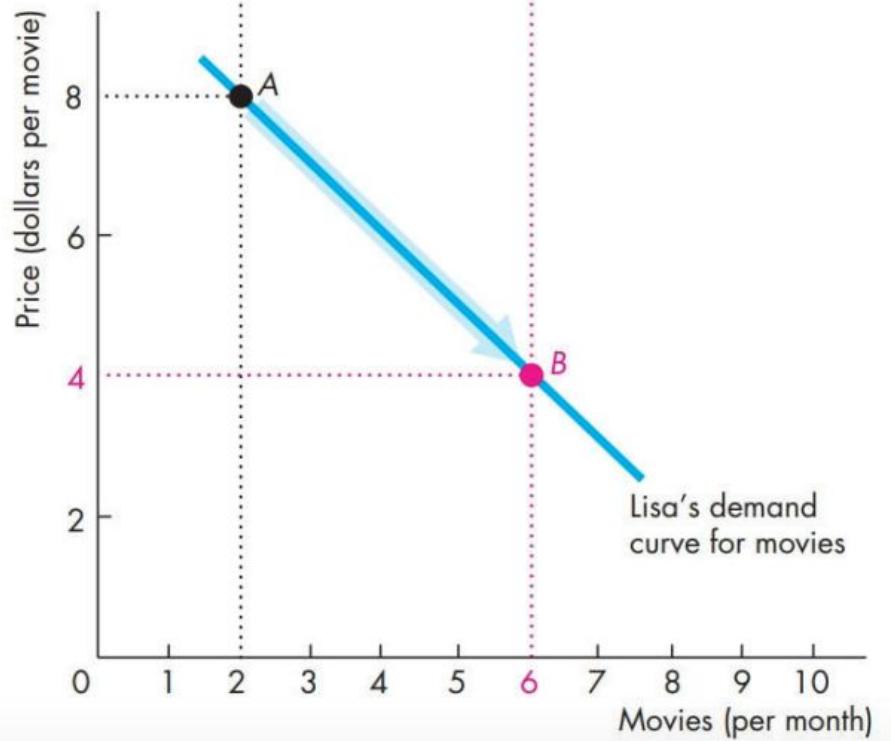


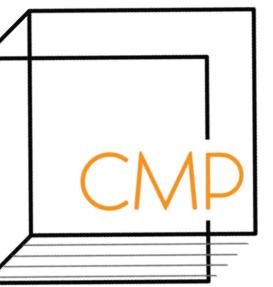
9. Utility & Demand - Price Effect

- **Price Effect:** when a change in the price of a good affects the quantity of the good consumed
- Price changes ... slope changes → best affordable choice changes
- Explains why the demand curve is *downward sloping*



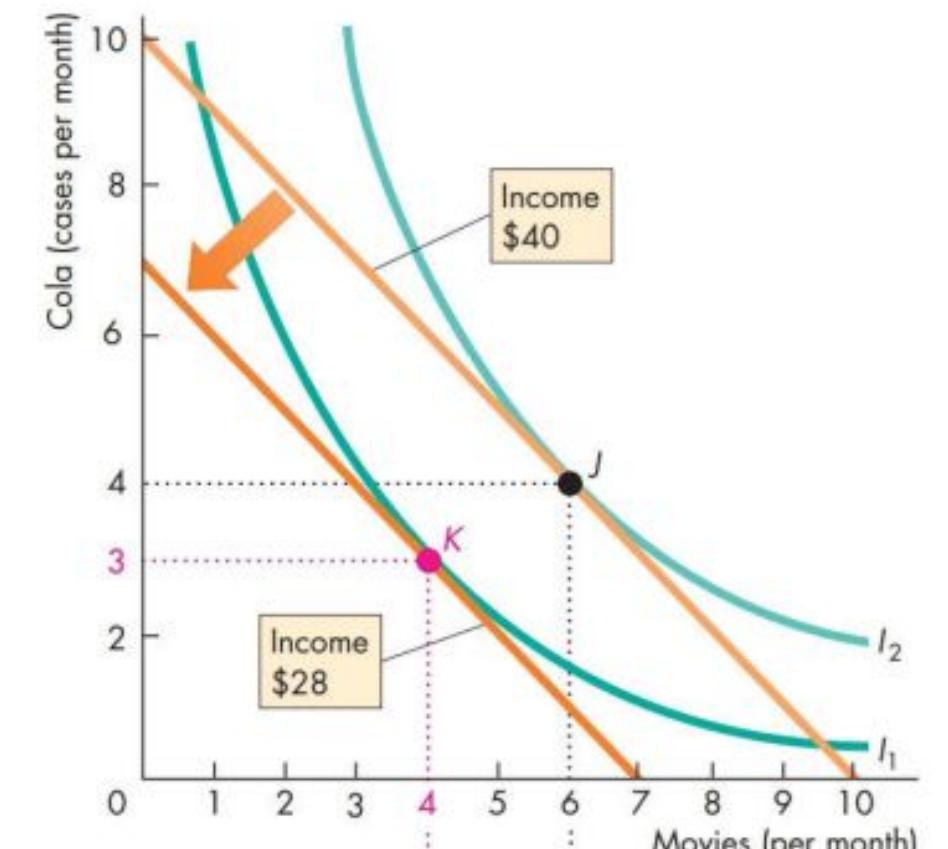
(a) Price effect



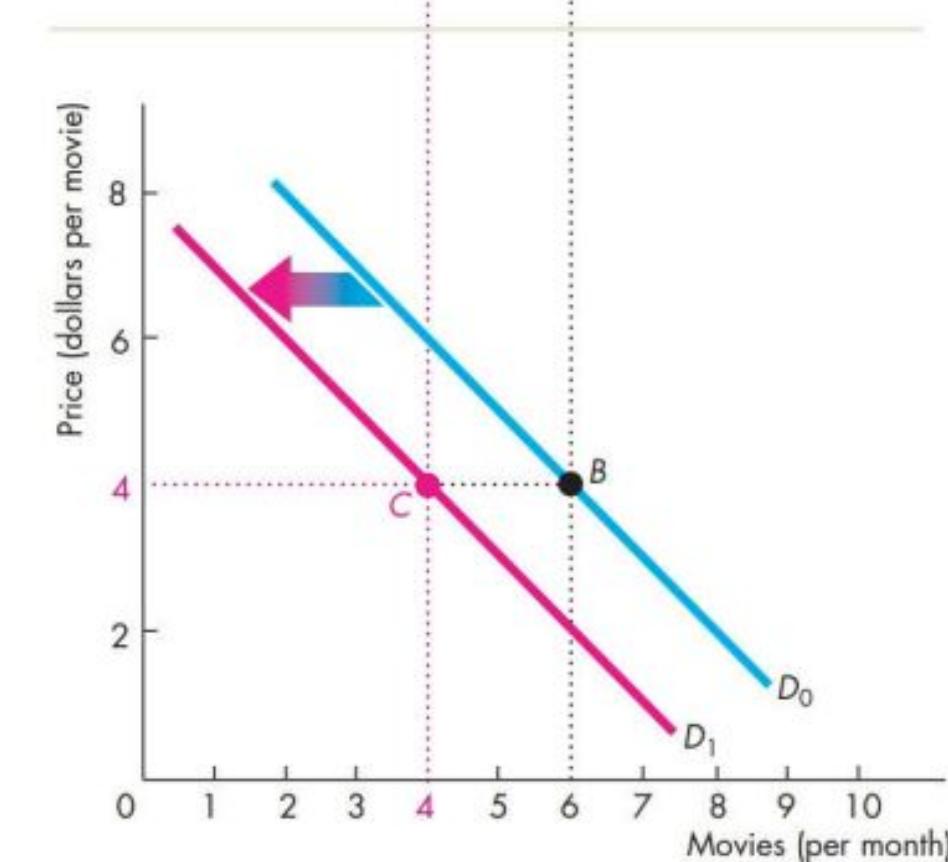


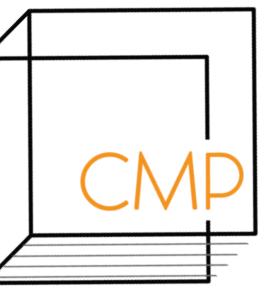
9. Utility & Demand - Income Effect

- **Income Effect:** when a change in income changes the quantity of the good consumed
 - Income changes ... budget line shifts → best affordable choice changes → demand curve changes
 - as income decreases, the consumer buys less of both goods
- Explains demand curve *shifts*



(a) Income effect





Practice!!

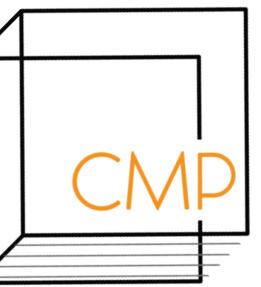
Q1: Bob was hired by BC Housing to decide an appropriate rent ceiling if the current equilibrium rent price is \$2500. Which of the following rent ceiling would be effective?

- a) \$2800
- b) \$2600
- c) \$2500
- d) \$1500

Q2: Production subsidies are different from ALL of the other government market interventions because:

- a) it leads to underproduction
- b) it leads to overproduction
- c) it forces price to go down
- d) All of the above





Practice!!

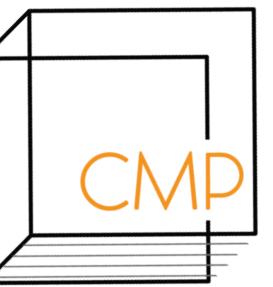
Q3: ___ can be used to regulate imports.

- a) tariffs
- b) quotas
- c) export subsidy
- d) a & b

Q4: If a tax is imposed on a life-saving medicine with perfectly inelastic demand:

- a) the buyer pays the entire tax amount
- b) the seller pays the entire tax amount
- c) the buyer and seller splits the tax amount evenly
- d) none of the above; it depends on the situation





Practice!!

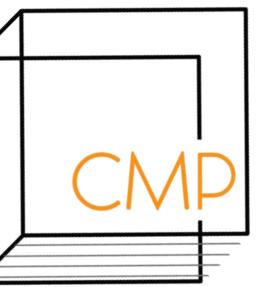
Q5: Hayley's parents either make steak or burger for dinner. If they've been making burger for the entire month, her marginal rate of substitution for steak would be _____ throughout November

- a) constant
- b) increasing
- c) decreasing
- d) fluctuating

Q6: Which of the following statements are correct about output & costs in the long run?

- I. Decisions are reversible
 - II. the number of plants and plant sizes can vary
 - III. the number of workers can vary
 - IV. output can only be increased by increasing labor
-
- a) I, II
 - b) I, IV
 - c) II, III
 - d) II, III, IV





Practice!!

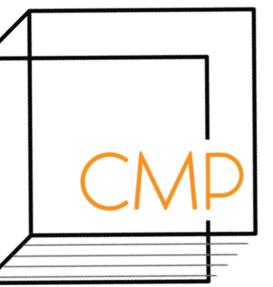
Q7: When is AP at its maximum?

- a) MP > AP
- b) MP < AP
- c) MP = AP
- d) MP = ATC

Q8: True or False: “Joey has \$20 dollars to spend for lunch. She maximized her total utility by purchasing a \$10 bento box and a \$2 Iced cappuccino.”

- a) True
- b) False





Practice!!

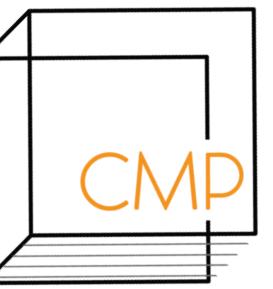
Q9: Carlie buys cereal or oatmeal. If cereal is on the x-axis and its price increased, the budget line will

- a) shift to the left
- b) shift to the right
- c) become steeper
- d) become flatter

Q10: Compared to unregulated imports, tariffs ____ consumer surplus and ____ producer surplus.

- a) decrease; increase
- b) decrease; doesn't change
- c) increase; decrease
- d) doesn't change, increase





PART 3

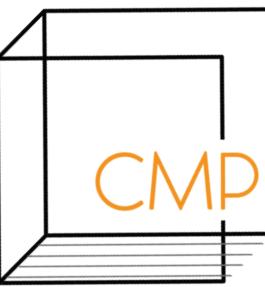
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Part 1:

- Externalities
- Perfect Competition
- Monopoly

Part 2:

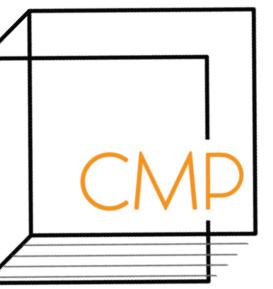
- Global Market in Action
- Government Actions in Market
- Output & Costs
- Utility & Demand

Part 3:

- What is Economics
- PPF, Gains from Trade
- Demand & Supply
- Elasticity
- Surplus & Efficiency

Newest to oldest

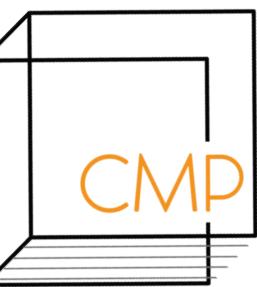




7. What is Economics

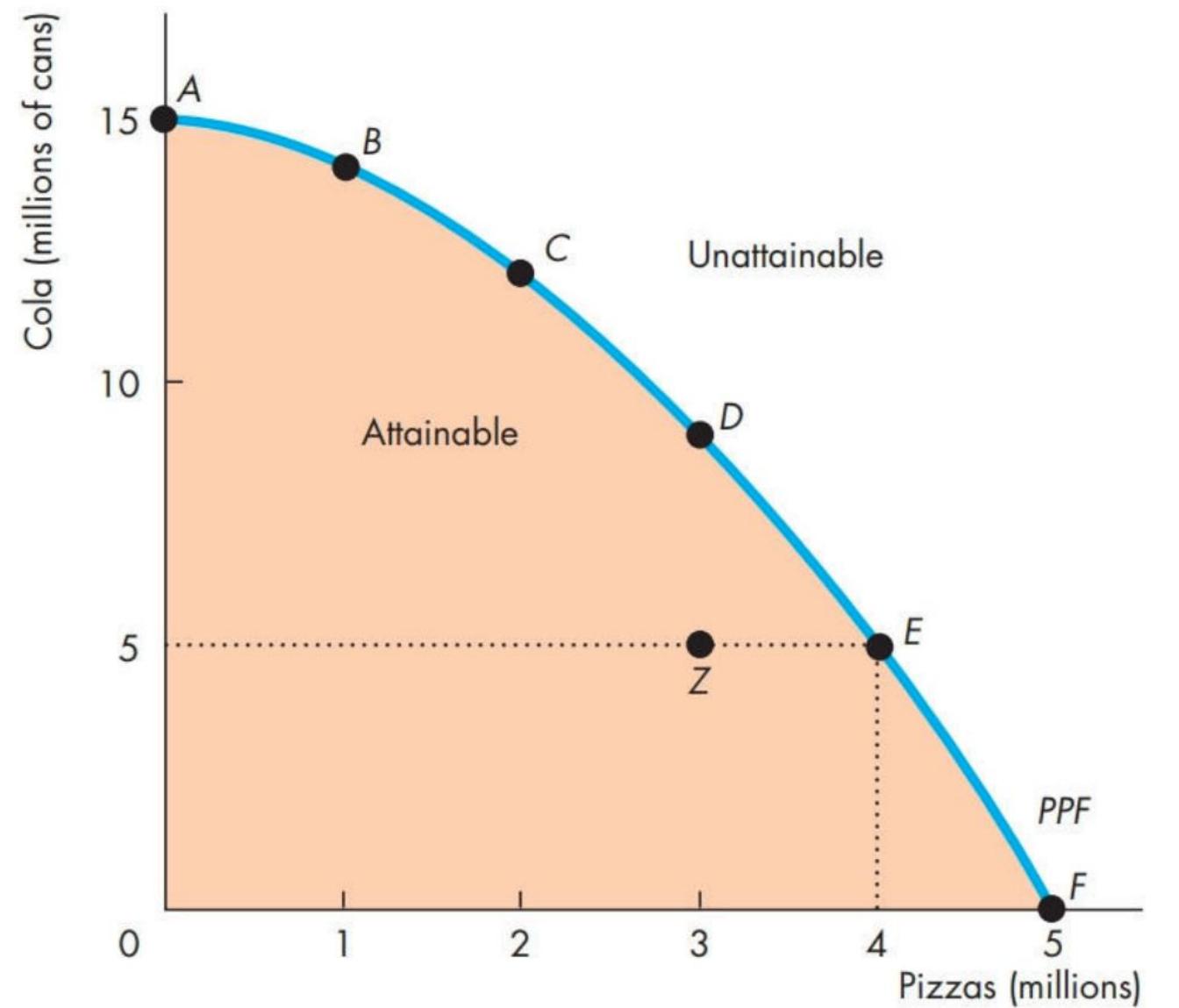
- **Economics:** social science that studies the choices individual people, businesses, government, and societies make to cope with scarcity
 - based on **scarcity:** our inability to get everything we want due to limited resources
 - leads to **trade-offs:** must give up 1 thing if you want another
 - **Microeconomics:** focuses on the choices people and businesses make
-
- **2 economic questions:**
 1. What, how, for whom to produce?
 2. When does self-interest promote social interest?

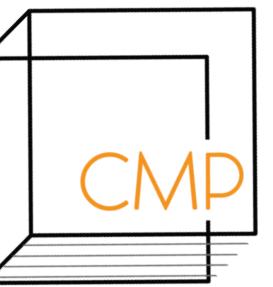




8. PPF

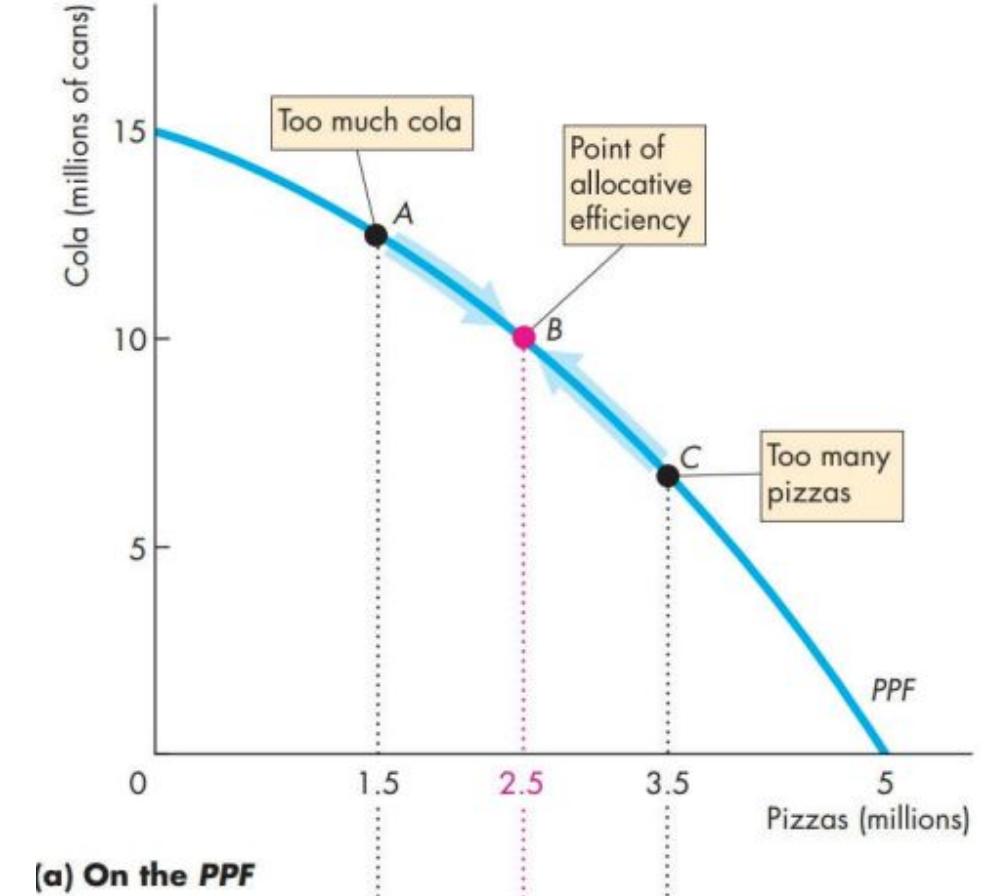
- **Production possibilities frontier (PPF):** the boundary between the combos of goods/services that can & can't be produced
 - all points on the curve are **production efficient:** goods/services are produced at the lowest possible cost
- assumes:
 - an economy only produces 2 goods at a time
 - **ceteris paribus:** other factors remain the same
- **Opportunity cost (OC):** next BEST alternative given up in order to get something else
 - OC of good A = # of good B



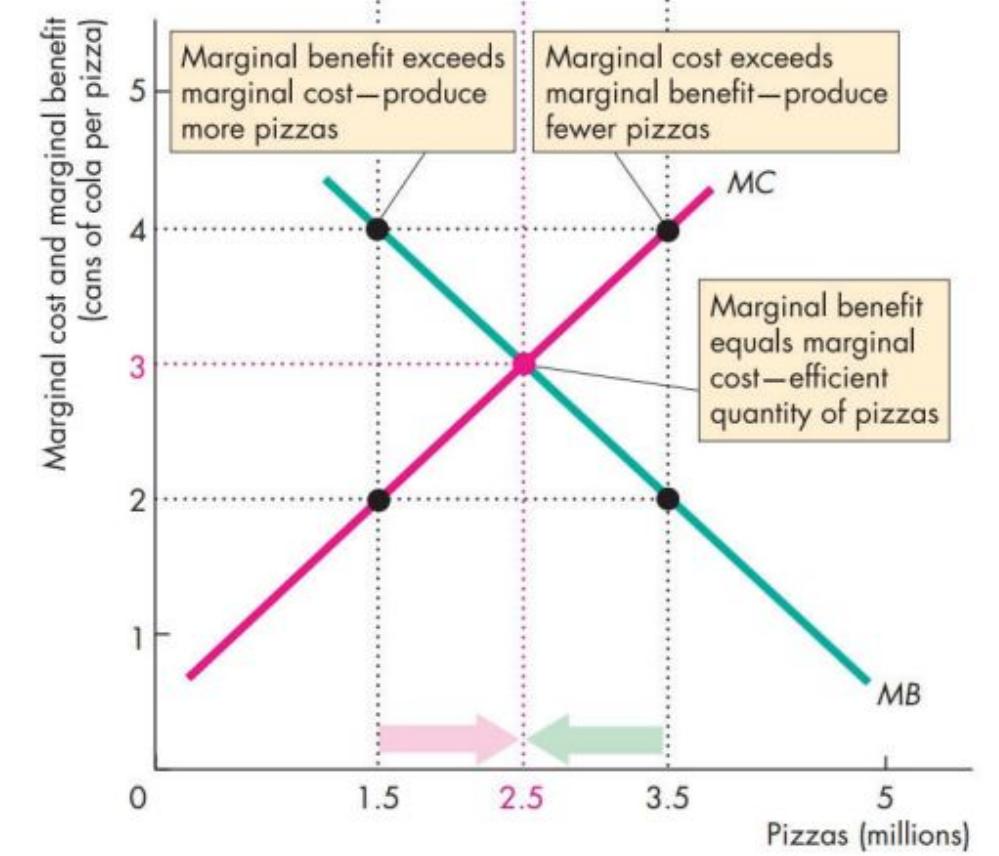


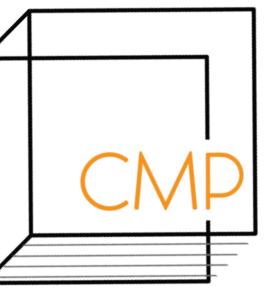
8. PPF - Using Resources Efficiently

- **Marginal cost (MC)**: OC of producing 1 additional unit
- **Marginal benefit (MB)**: benefit from consuming 1 additional unit
 - measured by people's willingness to pay for that additional unit
 - the more we consume it, the lower the marginal benefit we receive
- **allocative efficiency**: when you can't move more of 1 good without giving up another good that gives more benefit
 - $MC = MB \rightarrow$ producing the most efficient combination of the 2 goods, at **equilibrium (EQM)**



(a) On the PPF





8. Gains From Trade

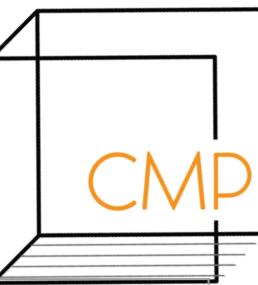
- **absolute advantage:** when a person is *more productive* than everyone else
- **comparative advantage:** when a person performs an activity at a *lower OC* than everyone else
 - comparative advantage → specialization → trade
 - **trading price:** Seller's OC $\leq P_{\text{good}} \leq$ Buyer's OC

Steps to Approaching Gains from Trade Problems:

1. Calculate the OCs
2. Determine who has a lower OC for each good → they will specialize in what they have a comparative advantage in
3. Determine the trading price: Seller's OC $\leq P_{\text{good}} \leq$ Buyer's OC
4. Gains from trade = # of goods_{before trade} – # of goods_{after trade}



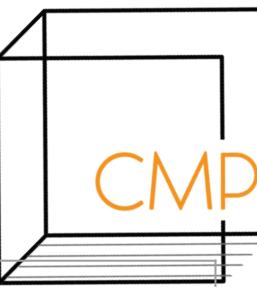
8. Demand, Supply, EQM



Demand (D)	Supply (S)	Equilibrium (EQM)																																																				
<ul style="list-style-type: none"> - Demand: when a person wants, can afford, and plan on buying something - Quantity demanded (Qd): how much a person plans to buy at a specific price - Law of Demand: if price increases, Qd decreases 	<ul style="list-style-type: none"> - Supply: when a firm have the ability to produce, can make profit, and plan on producing and selling something - Quantity supplied (Qs): how much a firm would produce at a specific price - Law of Supply: if price increases, Qs increases 	<ul style="list-style-type: none"> - market equilibrium: when $D = S$ 																																																				
<p>FIGURE 3.1 The Demand Curve</p> <table border="1"> <caption>Data for Figure 3.1: Demand for energy bars</caption> <thead> <tr> <th>Point</th> <th>Price (\$)</th> <th>Quantity Demanded (millions)</th> </tr> </thead> <tbody> <tr><td>A</td><td>0.50</td><td>22</td></tr> <tr><td>B</td><td>1.00</td><td>15</td></tr> <tr><td>C</td><td>1.50</td><td>10</td></tr> <tr><td>D</td><td>2.00</td><td>5</td></tr> <tr><td>E</td><td>2.50</td><td>0</td></tr> </tbody> </table>	Point	Price (\$)	Quantity Demanded (millions)	A	0.50	22	B	1.00	15	C	1.50	10	D	2.00	5	E	2.50	0	<p>FIGURE 3.4 The Supply Curve</p> <table border="1"> <caption>Data for Figure 3.4: Supply of energy bars</caption> <thead> <tr> <th>Point</th> <th>Price (\$)</th> <th>Quantity Supplied (millions)</th> </tr> </thead> <tbody> <tr><td>A</td><td>0.50</td><td>0</td></tr> <tr><td>B</td><td>1.00</td><td>5</td></tr> <tr><td>C</td><td>1.50</td><td>10</td></tr> <tr><td>D</td><td>2.00</td><td>15</td></tr> <tr><td>E</td><td>2.50</td><td>20</td></tr> </tbody> </table>	Point	Price (\$)	Quantity Supplied (millions)	A	0.50	0	B	1.00	5	C	1.50	10	D	2.00	15	E	2.50	20	<table border="1"> <caption>Data for Figure 3.5: Market Equilibrium</caption> <thead> <tr> <th>Point</th> <th>Price (\$)</th> <th>Quantity (millions)</th> <th>Status</th> </tr> </thead> <tbody> <tr><td>A</td><td>1.00</td><td>22</td><td>Shortage of 9 million bars</td></tr> <tr><td>D</td><td>2.00</td><td>14</td><td>Surplus of 6 million bars</td></tr> <tr><td>Equilibrium</td><td>1.50</td><td>10</td><td>Market Equilibrium</td></tr> </tbody> </table>	Point	Price (\$)	Quantity (millions)	Status	A	1.00	22	Shortage of 9 million bars	D	2.00	14	Surplus of 6 million bars	Equilibrium	1.50	10	Market Equilibrium
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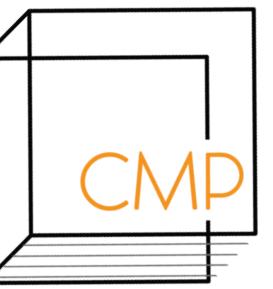


8. Demand, Supply, EQM - Shifts



Demand (D)	Supply (S)	Equilibrium (EQM)
<ul style="list-style-type: none"> - P related goods (complementary goods, substitute goods) - P expected future - Income - Future income - Population - Preference 	<ul style="list-style-type: none"> - P factors of production - P related goods produced - P expected future - Number of suppliers - Technology - State of Nature 	<ul style="list-style-type: none"> - EQM would change if Demand and/or Supply curve changes

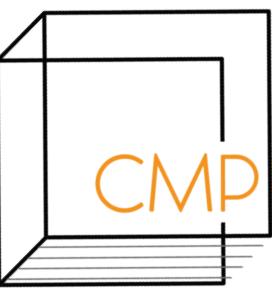




9. Elasticity - ed, es

	Price elasticity of demand	Price elasticity of supply
Definition	- how responsive Qd is to a change in P	- how responsive Qs is to a change in P
Formula	<ul style="list-style-type: none">- $ed = \frac{\% \Delta Q_d}{\% \Delta P} = \frac{(\Delta Q_d / Q_d \text{ avg})}{(\Delta P / P \text{ avg})}$	<ul style="list-style-type: none">- $es = \frac{\% \Delta Q_s}{\% \Delta P} = \frac{(\Delta Q_s / Q_s \text{ avg})}{(\Delta P / P \text{ avg})}$
Factors that Influence it	<ul style="list-style-type: none">- closeness of substitutes- proportion of income spent on good- time elapsed since price change	<ul style="list-style-type: none">- resource substitution possibilities- time frame for supply decision



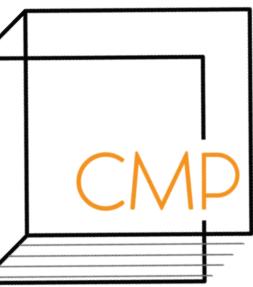


9. Elasticity - 5 Types of Ed

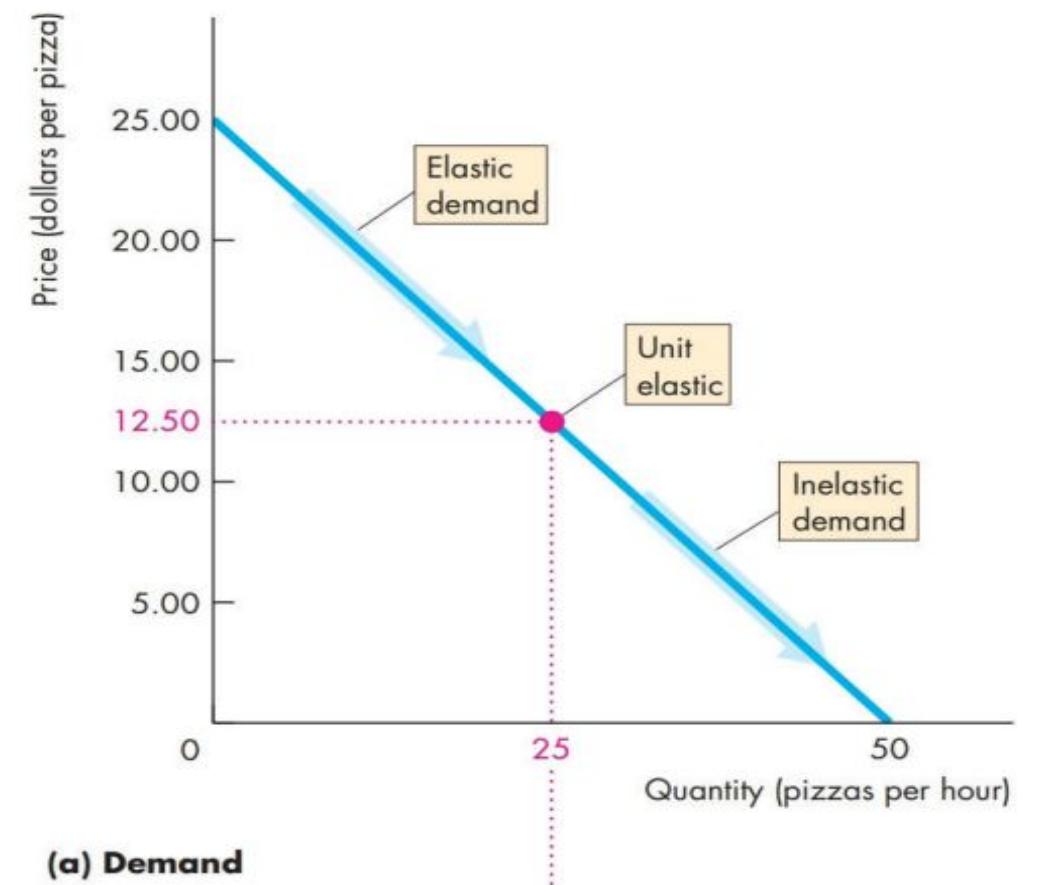
	perfectly inelastic	inelastic	unit elastic	elastic	perfectly elastic
Definition	Qd stays the same regardless of P	Qd reacts little to P changes	Qd changes in the same proportion as the change in P	Qd reacts alot to P changes	Qd changes by an infinitely large amount when P changes
ed range	$ed = 0$	$ed < 1 $	$ed = 1 $	$ed > 1 $	$ed = \infty $
graph					
examples	- insulin	- food - shelter		- cars - furnitures	- 2 soft drinks side-by-side in a vending machine



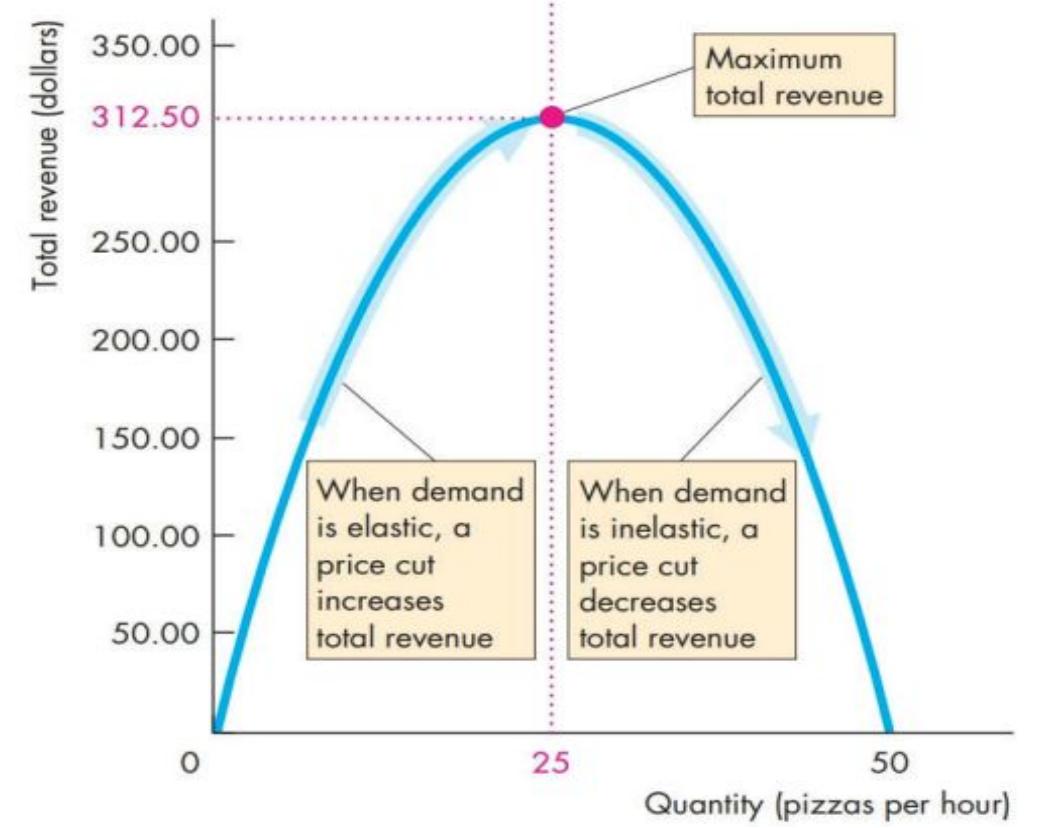
9. Elasticity - Total Revenue (TR)

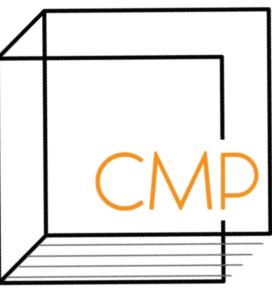


- $ed = \text{elastic}$
 - upper half of a linear demand curve
 - decrease price to maximize TR
- $ed = \text{inelastic}$
 - lower half of a linear demand curve
 - increase price to maximize TR
- $ed = \text{unit elastic}$
 - midpoint of a linear demand curve
 - maximizes TR



(a) Demand

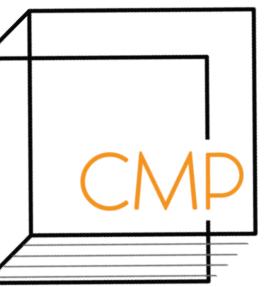




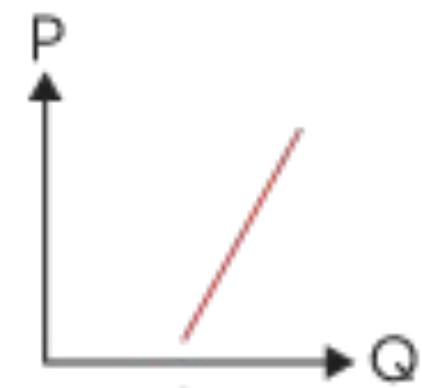
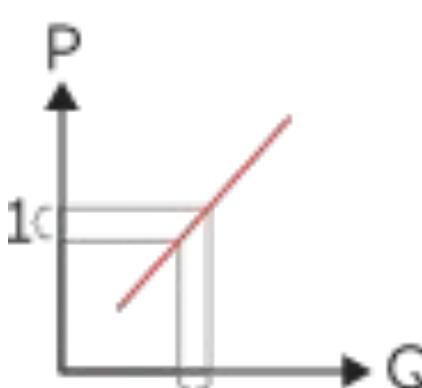
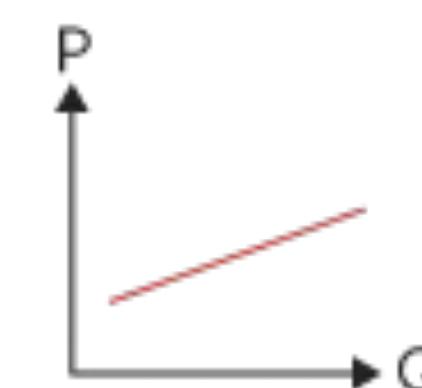
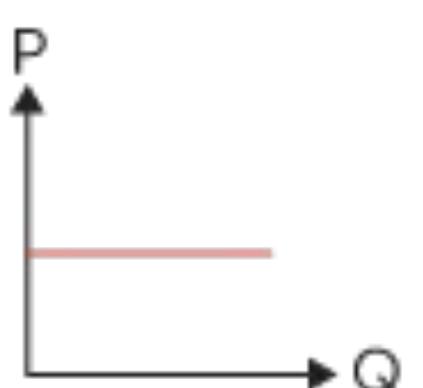
9. Elasticity - More Elasticity

	Cross Elasticity (ec)	Income Elasticity (ei)
Definition	<ul style="list-style-type: none"> - cross elasticity: how responsive demand for a good is when $P_{\text{substitute or complement}}$ changes 	<ul style="list-style-type: none"> - income elasticity: how responsive demand for a good is when income changes
Formula	<ul style="list-style-type: none"> - $ec = \frac{\% \Delta Qd}{\% \Delta P_{\text{sub/complement}}}$ 	<ul style="list-style-type: none"> - $ei = \frac{\% \Delta Qd}{\% \Delta \text{income}}$
Range	<ul style="list-style-type: none"> - $ec < 0 \rightarrow \text{complement good:}$ used with the good - $ec > 0 \rightarrow \text{substitute good:}$ can replace the good 	<ul style="list-style-type: none"> - $ei \geq 1 \rightarrow \text{income elastic, normal good:}$ demand for it rises when income rises - $0 < ei < 1 \rightarrow \text{income inelastic, normal good}$ - $ei < 0 \rightarrow \text{depends, inferior good:}$ demand for it drops when income rises



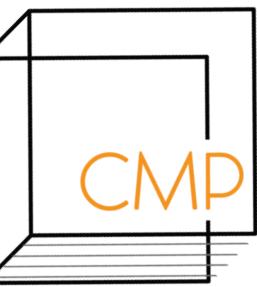


9. Elasticity - 5 Types of Es

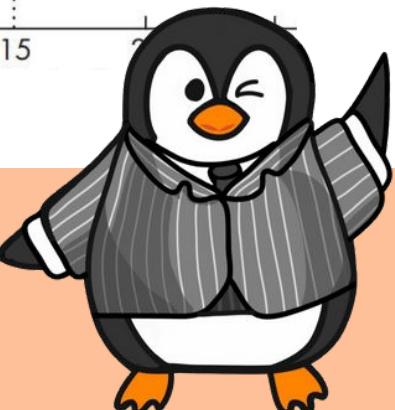
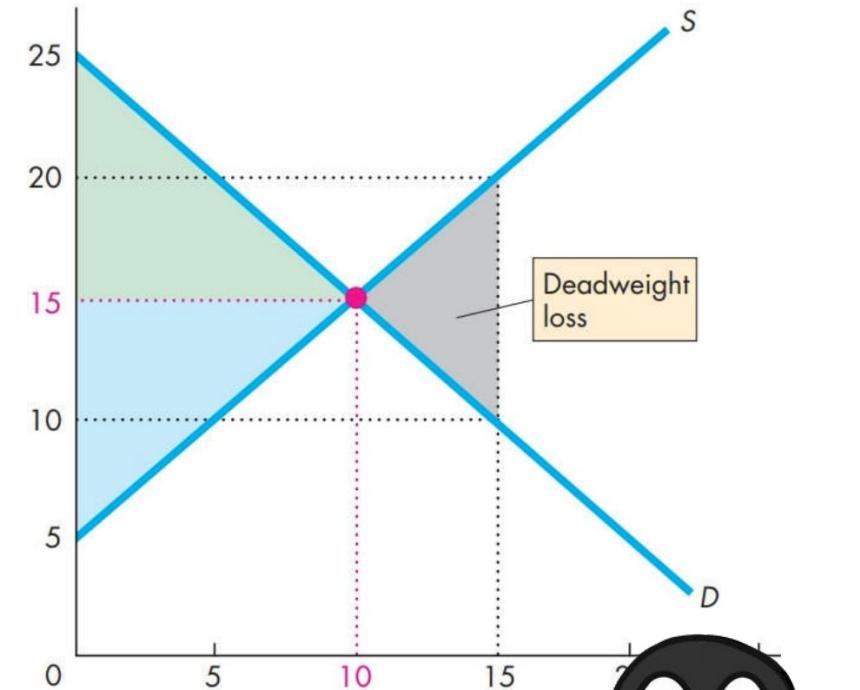
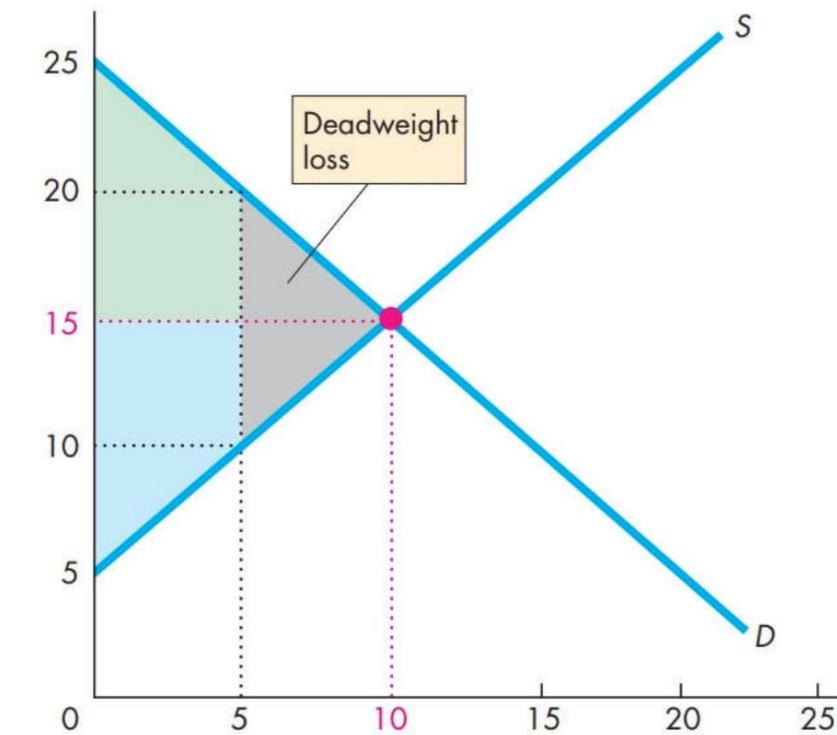
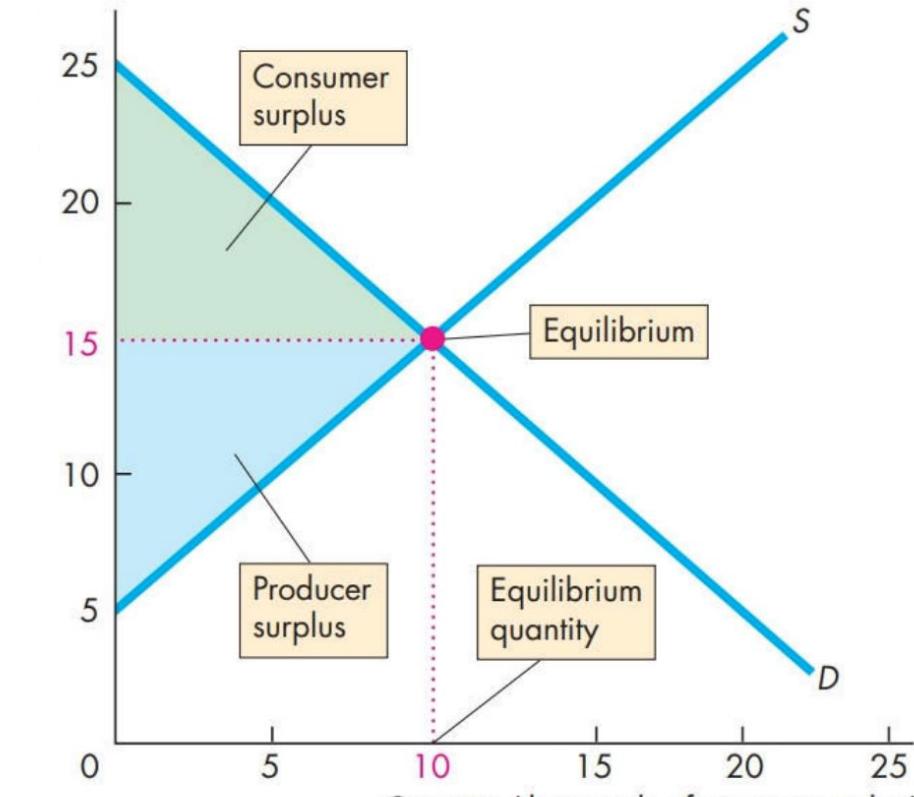
	perfectly inelastic	inelastic	unit elastic	elastic	perfectly elastic
Definition	Q _s stays the same regardless of P	Q _s reacts little to P changes	when a linear supply curve passes through the origin	Q _s reacts a lot to P changes	when the supplier is willing to sell any quantity at a specific P
es range	$es = 0$	$es < 1 $	$es = 1 $	$es > 1 $	$es = \infty$
Graph					
Examples	- Van Gogh painting				- goods that are produced in many countries

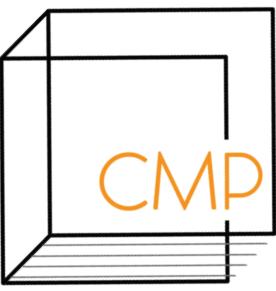


10. Surplus & Efficiency



- **consumer surplus (CS):** \$ saved
 - when what you're willing to pay > what you actually pay
 - the area below the demand curve but above the price
- **producer surplus (PS):** excess \$ received
 - when what you actually receive > what you expected
 - the area above the supply curve but below the price
- when not at EQM:
 - inefficient
 - **deadweight loss (DWL):** amount of lost surplus



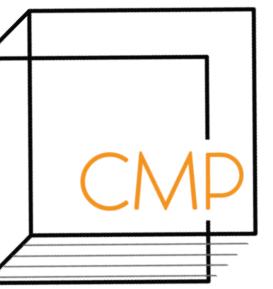


Extra - Sources of Market Failure

- **market failure:** when a market is inefficient either due to underproduction or overproduction

Underproduction	Overproduction
<ol style="list-style-type: none">1. price & quantity regulations2. taxes3. positive externalities4. public good: benefits everyone, no one can be excluded from them<ul style="list-style-type: none">- eg. national defense- underproduce because everyone depends on others to pay for it (freeride)5. monopoly6. high translation costs	<ol style="list-style-type: none">1. subsidy2. negative externalities3. common resource: owned by no one, but everyone can use it<ul style="list-style-type: none">- eg. atlantic salmon- overproduce because everyone would overuse it





Practice!!

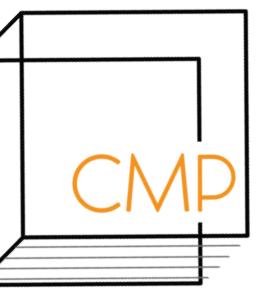
Q1: Carson wants to take LING 101 and PSYCH 101, but he can only take 1 elective. This demonstrates _____. If he chooses LING 101 over PSYCH 101, he made a ____:

- a) scarcity; tradeoff
- b) limited liability; unlimited liability
- c) indifference curve; preference map
- d) production efficiency; allocative efficiency

Q2: If the demand for crayons increases while their supply decreases:

- a) both Price and Quantity increase
- b) both Price and Quantity decrease
- c) Price increases, but Quantiy can't be determined
- d) Price increases, but Quantity decreases





Practice!!

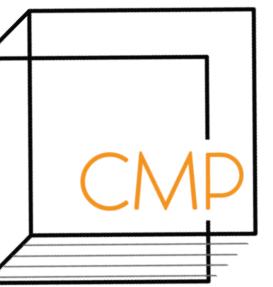
Q3: A vacation at a luxurious resort is usually demand elastic due to:

- a) Closeness of substitutes
- b) Time elapsed since price change
- c) Time frame for supply decision
- d) Proportion of income spent on good

Q4: True or False: “Economic growth doesn’t eliminate scarcity.”

- a) True
- b) False





Practice!!

Q5: McDonalds and Burger King have a positive cross elasticity. If the price of Big Mac increases, people demand ____ Whopper. Therefore, they are ____.

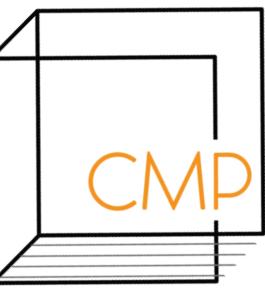
- a) less; substitute goods
- b) less; complementary goods
- c) more; complementary goods
- d) more; substitute goods

Q6: The stuffed toy market has a demand function of $P = 54 - 4Q$. To maximize total revenue, the price should be set at:

- a) \$54
- b) \$27
- c) \$17
- d) \$4



Practice!!



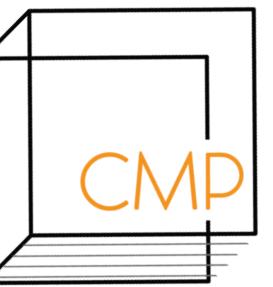
Q7: iPads are substitute goods of Tablets, and Apple Pencils are a complementary goods of iPads. Demand for Apple Pencils would increase if:

- a) the price for iPads decreased
- b) the price for Tablets decreased
- c) Paper notes are considered more aesthetic among university students
- d) university students' disposable income is decreasing

Q8: This Friday, Perry can either study for finals, go to a party or shop for Christmas gifts. He prefers shopping over studying, but he prefers partying over shopping, so he decided to go party. What's the opportunity cost of the decision?

- a) Shopping only
- b) Studying only
- c) Shopping + Studying
- d) Shopping + Studying + Partying





Practice!!

Q9: Wanda and Wilson both buy pizza from the same restaurant with the same supply function and price. However, Wanda has a bigger consumer surplus compared to Wilson. Why?

- a) Wilson is willing to pay more for pizza than Wanda
- b) Wanda must value pizza more than Wilson
- c) The restaurant price discriminates
- d) This scenario is impossible

Q10: Lamb wool can be made into yarn, but we also consume lamb for their meat. If the price for yarn increased, which scenario(s) would occur?

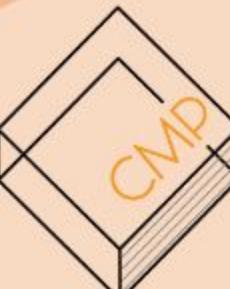
- a) the supply for yarn would decrease
- b) the supply of lamb meat would increase
- c) the price for lamb meat would decrease
- d) b and c



Break Time!



We hope you have been enjoying the review session so far! When you have a chance, please fill out our survey. We appreciate your feedback. You can be entered to win a \$20 giftcard of your choice!



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