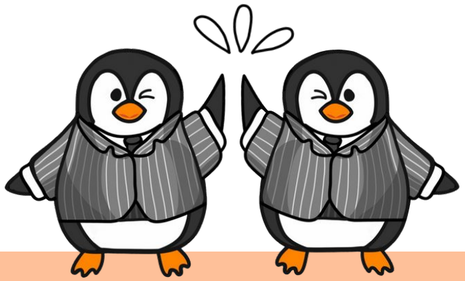
CMP

COMMERCE MENTORSHIP PROGRAM

FINAL REVIEW SESSION

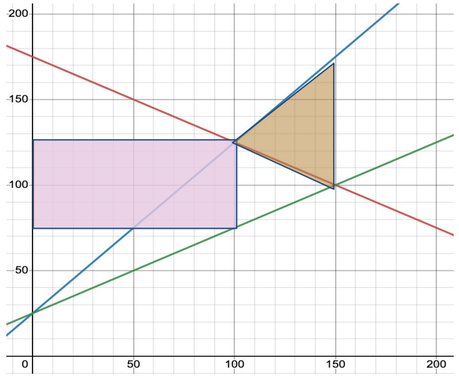
ECON 101



Prepared by: Jessalyn Sin

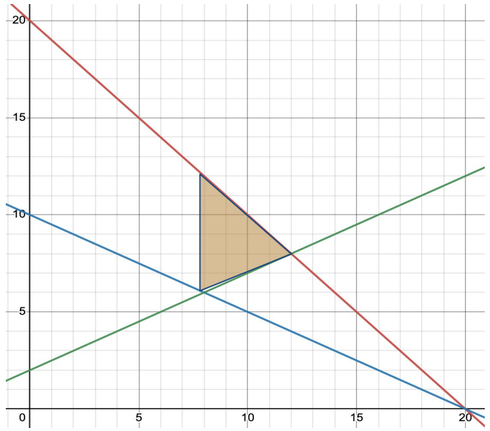
NOTE: CORRECTIONS!

- For **negative production externalities** where there is **overproduction**, the DWL is the triangle on the **right**



  - **see the practice question for negative production externalities for the correction of the DWL**

- For **positive consumption externalities** where there is **underproduction**, the DWL is the triangle on the **left**



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Newest to oldest

1. Externalities

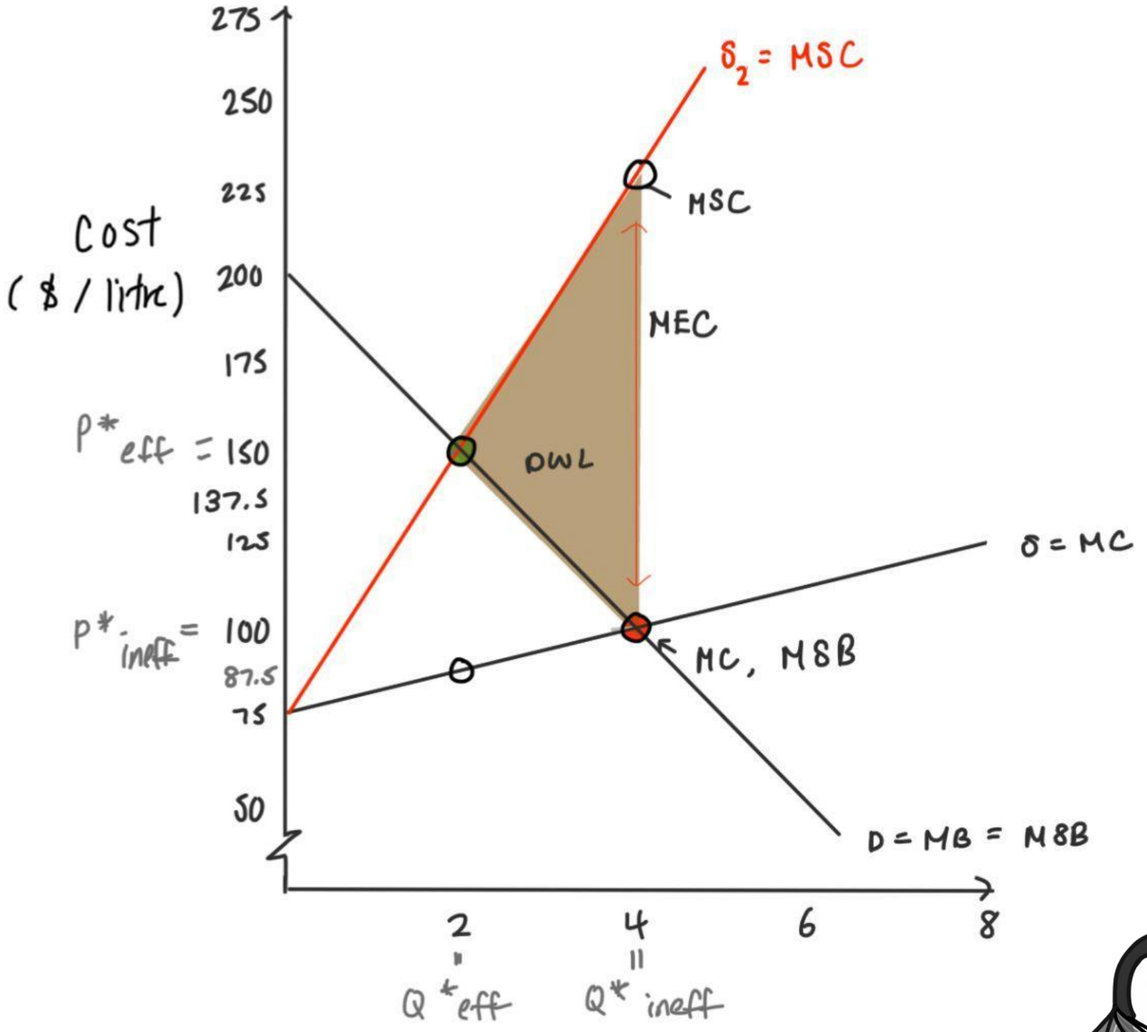
- **externality**: cost/ benefit that results from production/ consumption that affects someone other than the producer/ consumer
- 4 types:
    1. **Negative production externality**
        - eg. air pollution from factories
    2. **Positive production externality**
        - eg. putting a bee farm 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 the everyone else bears
  - **marginal external cost (MEC)**: external cost of producing 1 more unit
- **marginal social cost (of production)**: cost that the everyone (both the producer & everyone else) bears
  - MSC = MC + MEC
  - increases with output

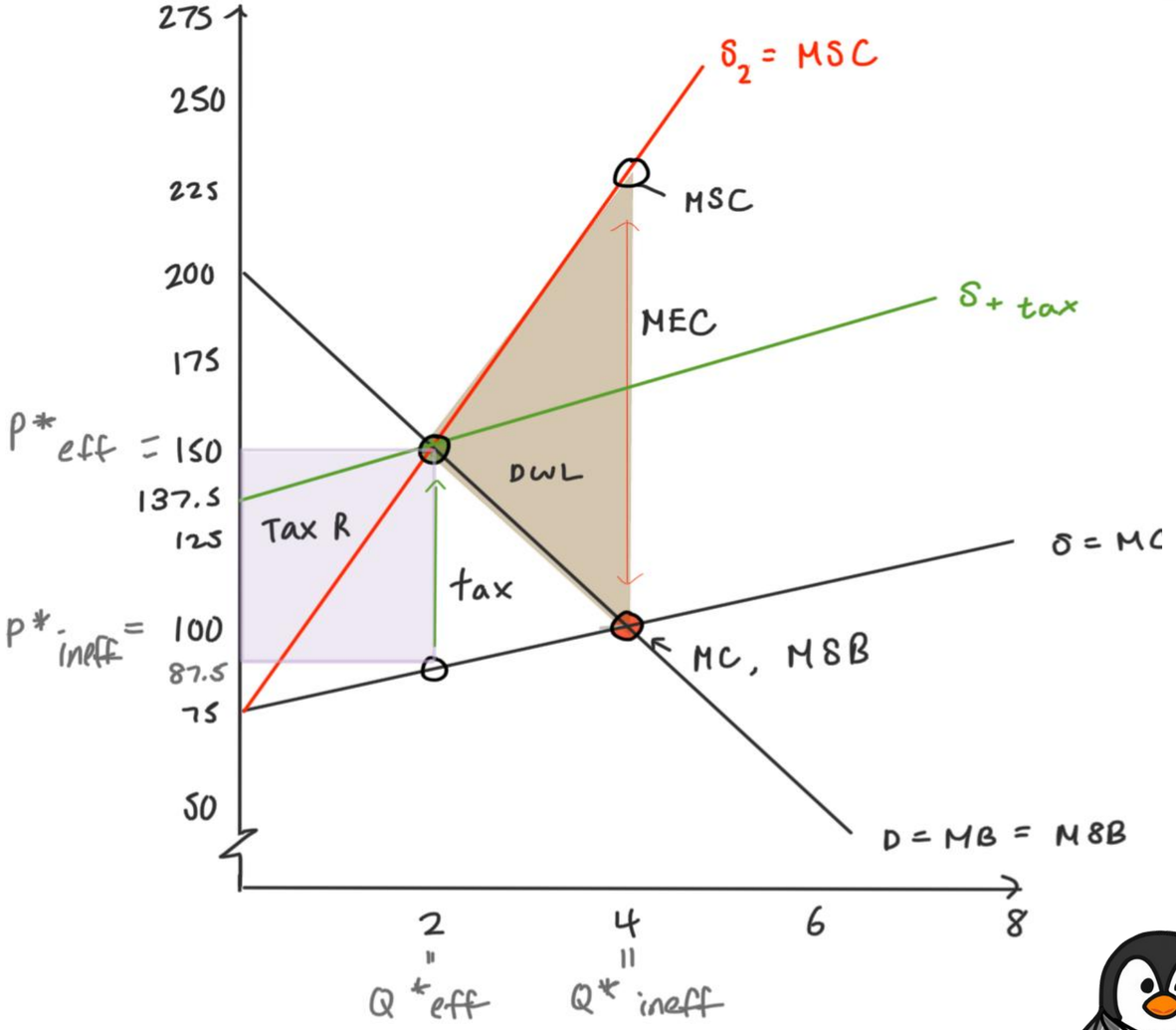
1. Externalities - Negative Production Externality

- 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 ⟶ **overproducing** ⟶ 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 ⟶ **S+tax**
  - raises MC up to equal MSC at the **efficient Q***



1. Externalities - Negative Production Externality

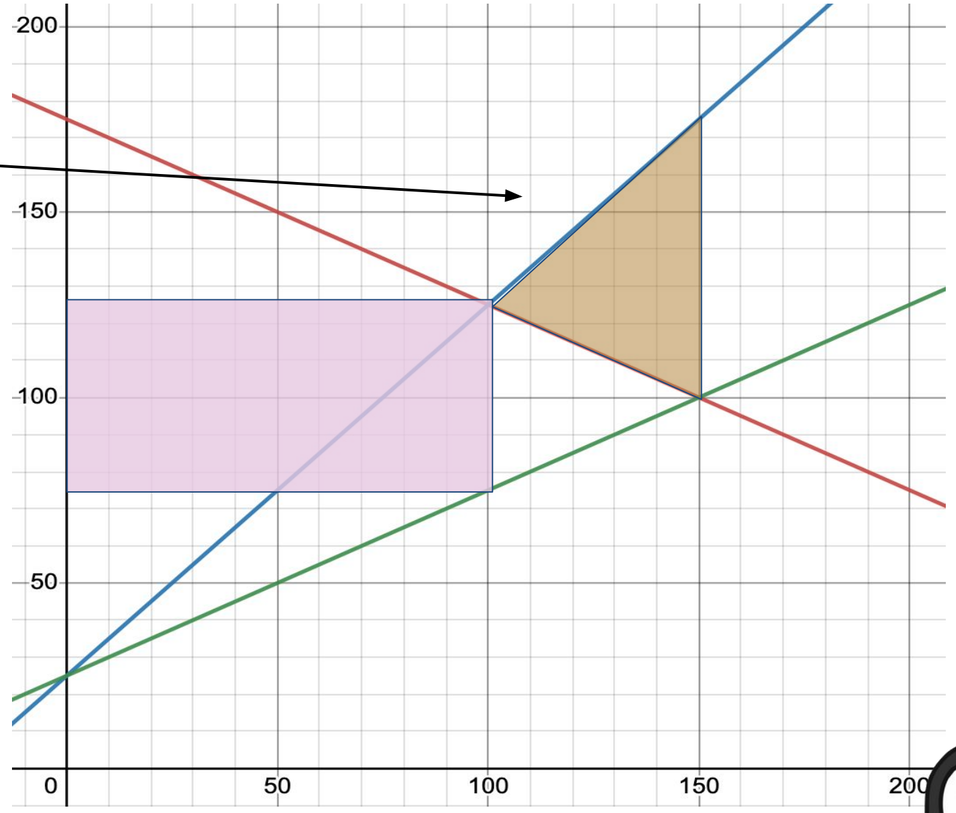
Q: CMP Plane Manufacturing Plant is located in the centre of the residential area and it produce noise pollution for those who live nearby. The market has the following demand and supply functions:

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

a. Calculate the DWL

DWL = (175 – 100)(150 – 100)/ 2 = $1875

CORRECTION!: This is the correct placement for the DWL (Google slides didn't save my corrections prior to the session, so my apologies for the confusion!)



b. How much taxes should be imposed on each plane to achieve EQM and what's the government's tax revenue?

At the efficient EQM: MSC = 125, MC = 75

MSC – MC = MEC; 125 – 75 = 50

The tax amount should be $50 per flight.

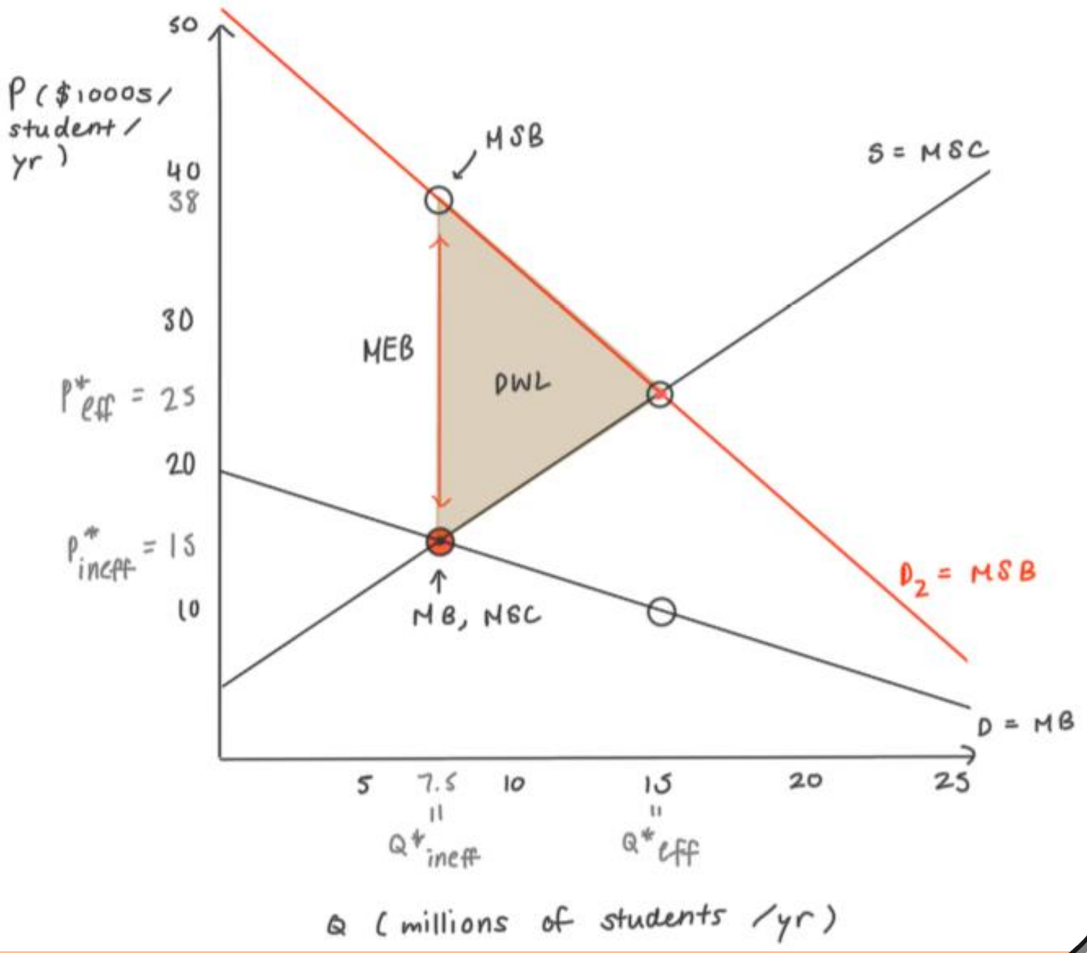
Tax Revenue = 50(100) = $500

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

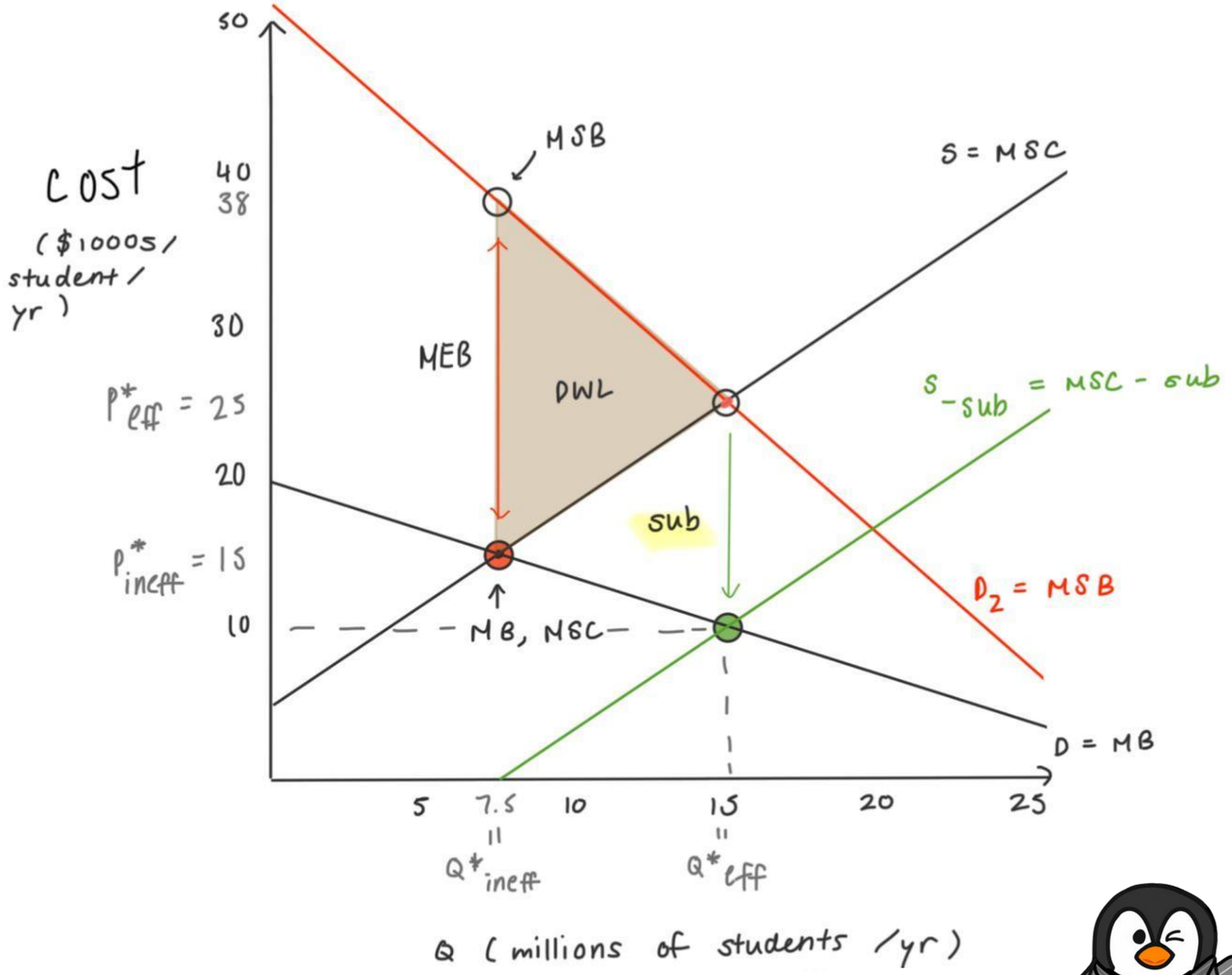
1. Externalities - Positive Consumption Externality

- 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 ⟶ **underproducing** ⟶ DWL
  - **Efficient EQM** is where MSC = MSB



1. Externalities - Subsidy

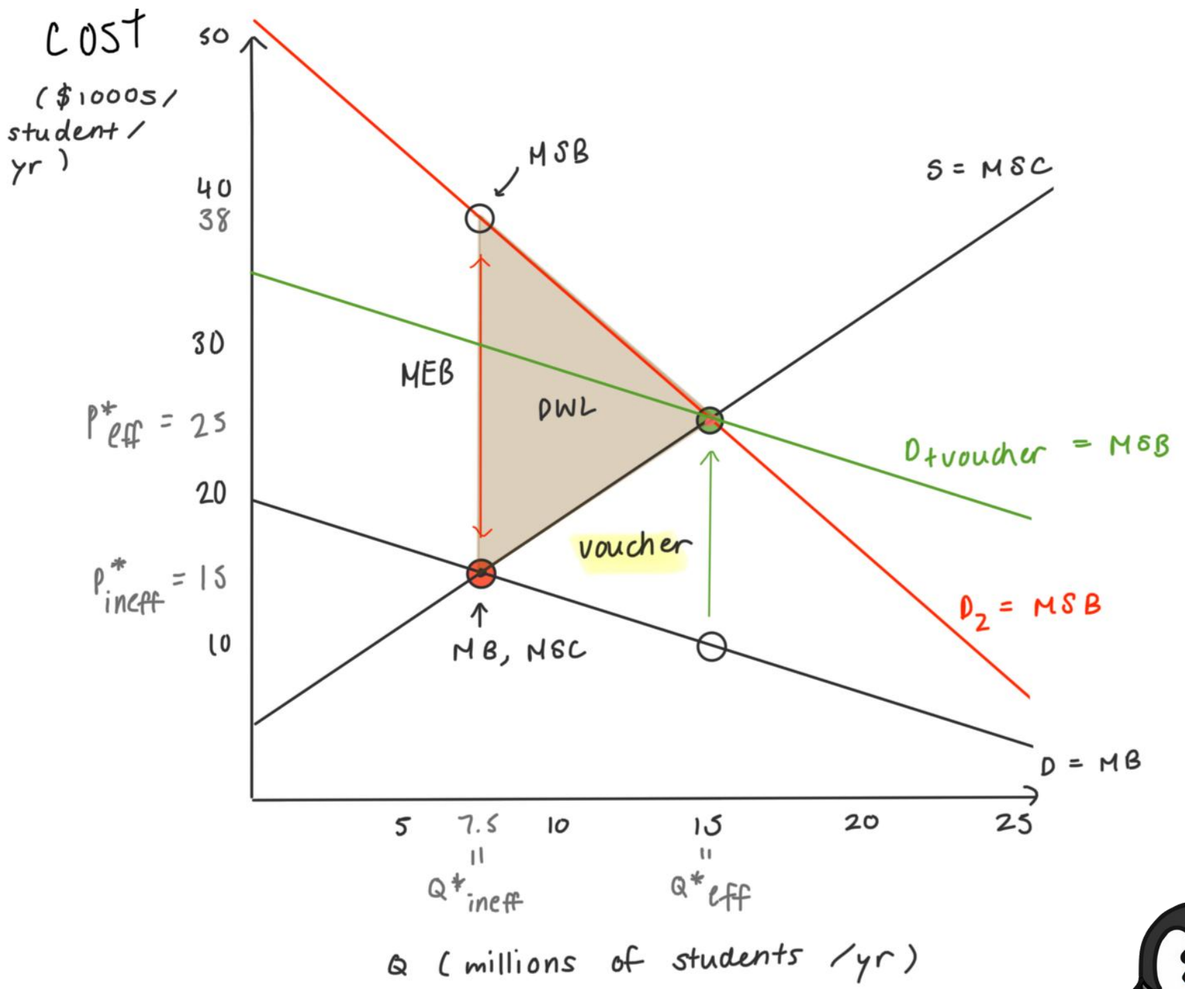
- Eg. Consider the UBC tuition market
- government forces market to the **efficient Q*** by imposing a **subsidy**
  - subsidy = MSB – MB = MEB at the **efficient Q***
  - S ⟶ **S–subsidy**
  - lowers MSC to equal MB at the **efficient Q***



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 ⟶ **D+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.

DWL = (12 – 6)(12 – 8)/ 2 = $12

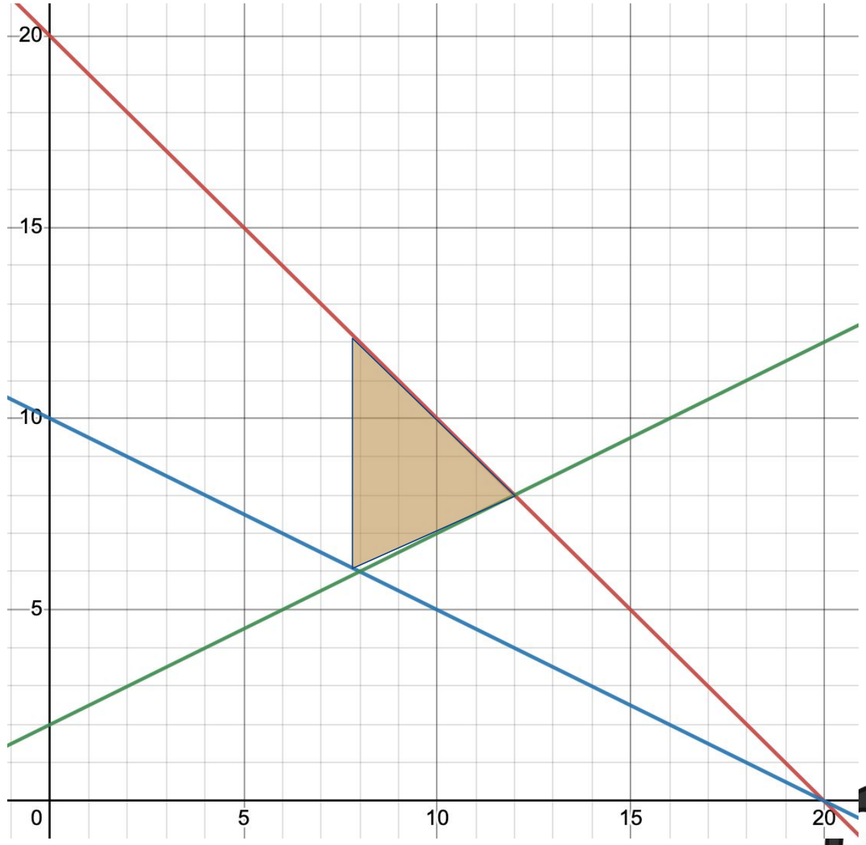
b. What should the subsidy or voucher amount be to achieve EQM and how much would the government have to spend on those?

At the efficient EQM: MSB = 8, MB = 4

MSB– MB = MEB; 8 – 4 = 4

The subsidy or voucher amount should be $4 per flu shot.

Budget needed for providing subsidy or vouchers = 4(12) = $48



2. Perfect Competition

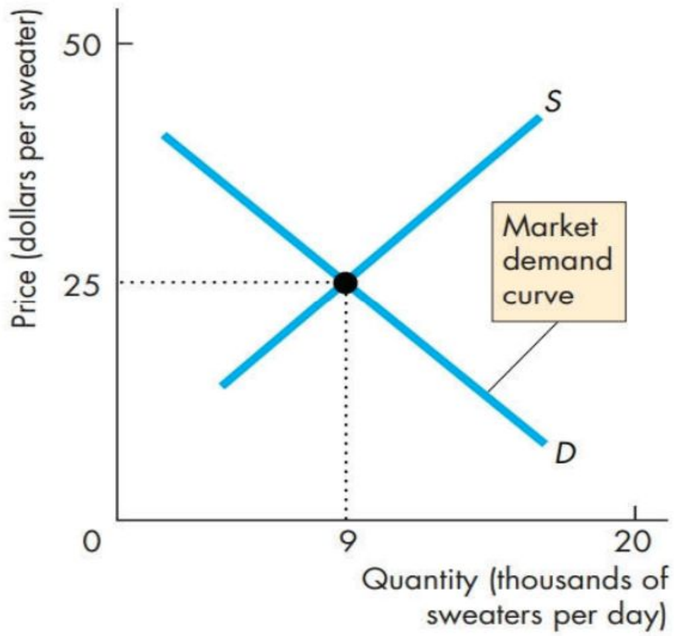
- **Perfect competition:** market where,
    1. many buyers & many sellers that sell identical products
    2. no restrictions to enter the industry
    3. established firms have NO advantage over new firms
    4. sellers & buyers are well-informed about the market price

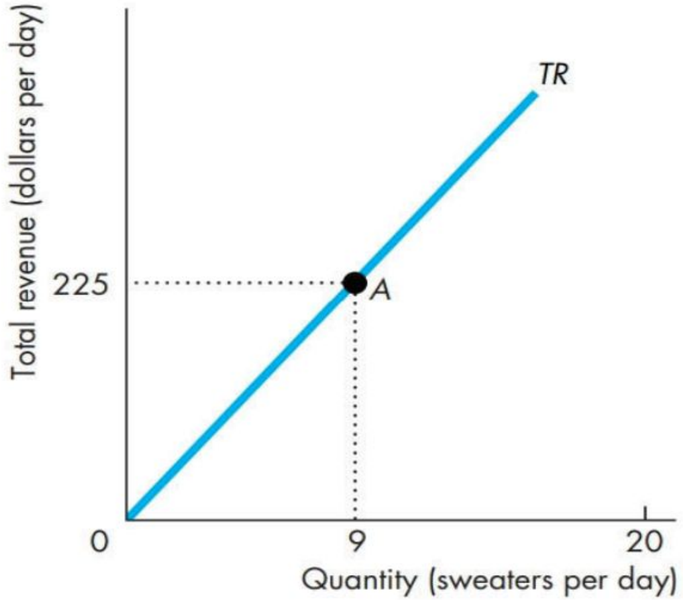
- every firm in perfect competition is a **price taker:** they can't influence the price
- every firm's products are identical → perfect substitutes → demand for each firm's products is perfectly elastic

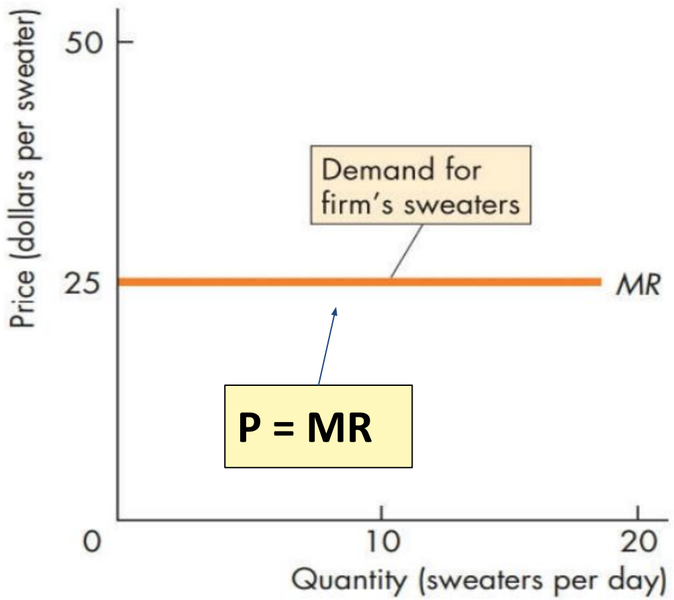
2. Perfect Competition

- **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







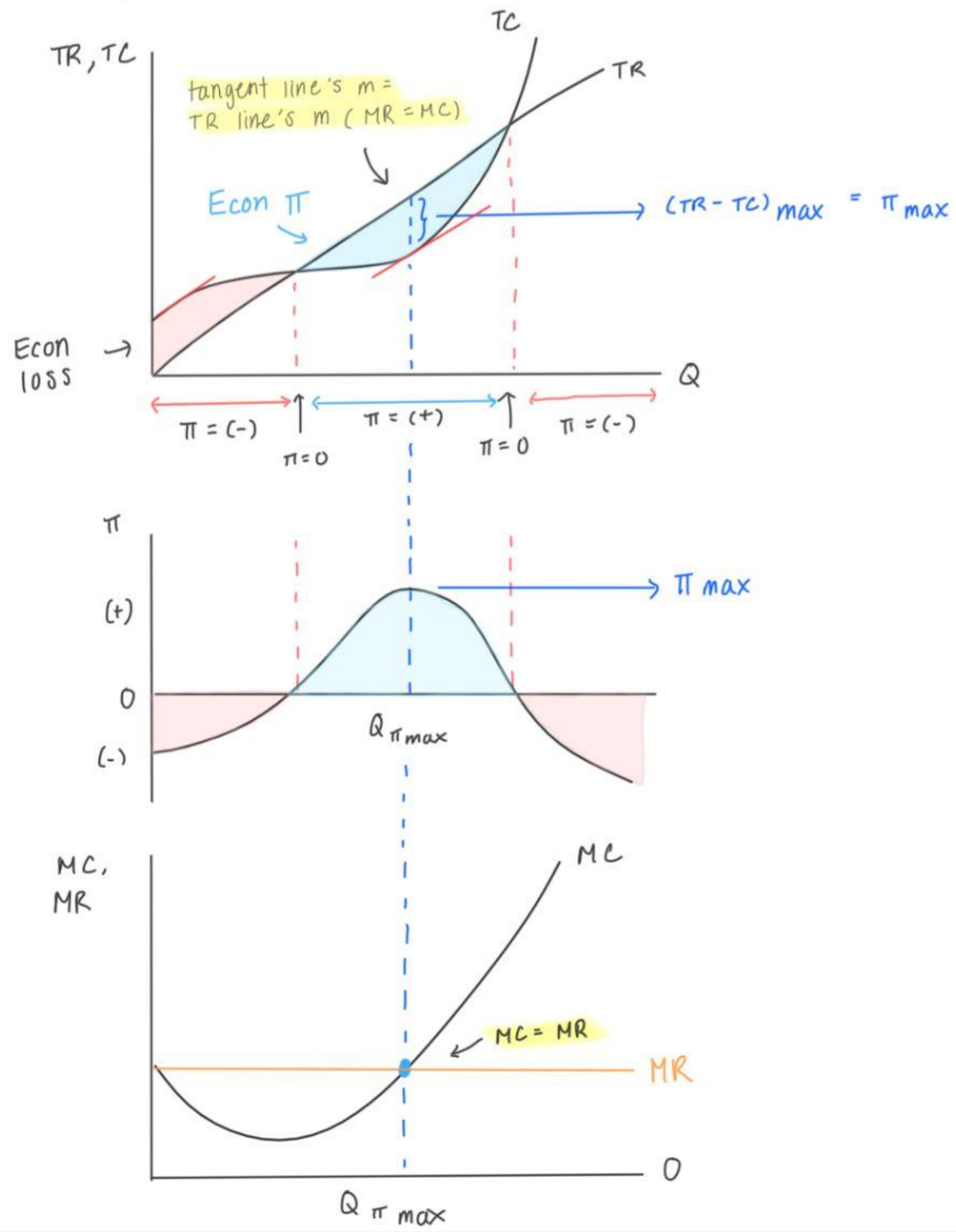
NOTE!

- 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

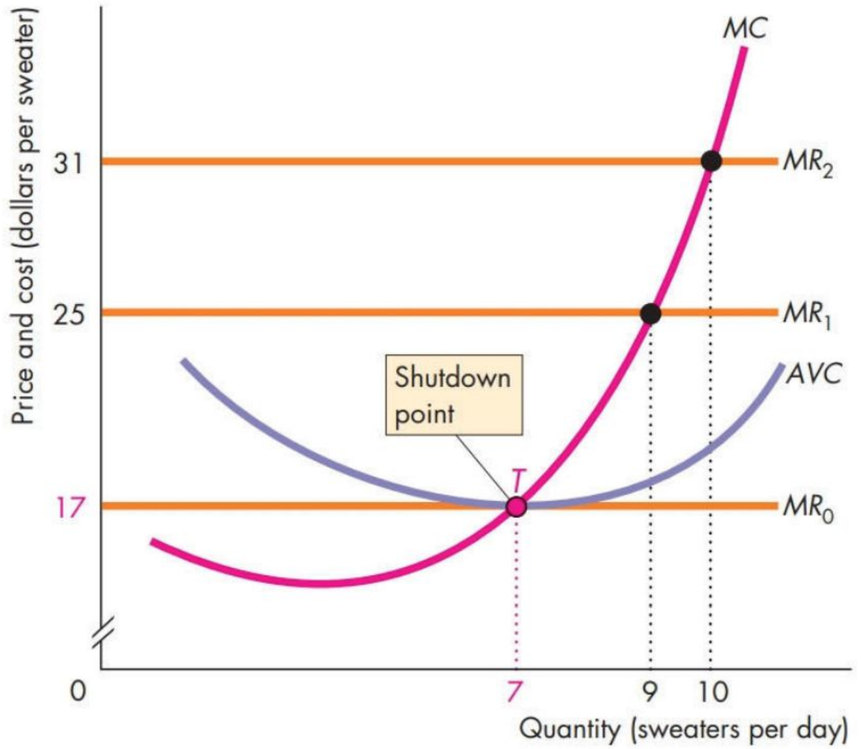
- **more specifically, a firm's goal is to maximize profit under <u>constraints</u>, but to do that, we must determine:**
    1. How to produce at minimum cost
    2. How much to produce in order to maximize profit (**profit maximizing output:** output that maximizes economic profit)
    3. When to enter 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
- BUT in the **short run**, they can only stay where they can either produce or temporarily shutdown
  - compare P with AVC min
- if P > AVC min ⟶ produce
- if P < AVC min ⟶ shutdown
- if P = AVC min ⟶ **shutdown (SD) point**
  - TR only covers TVC, so the only loss is TFC 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

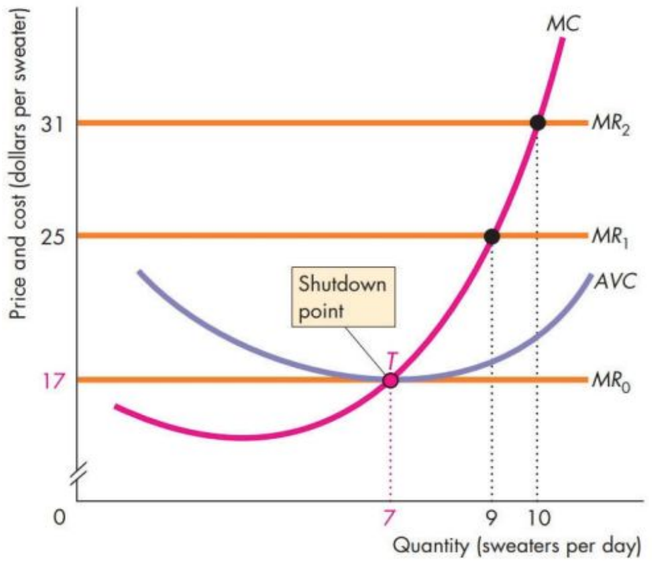
Since we are talking about the short run, the only options are to produce or temporarily shut down. Since P > AVC min, James would produce.

2. Perfect Competition - Firm's Supply Curve

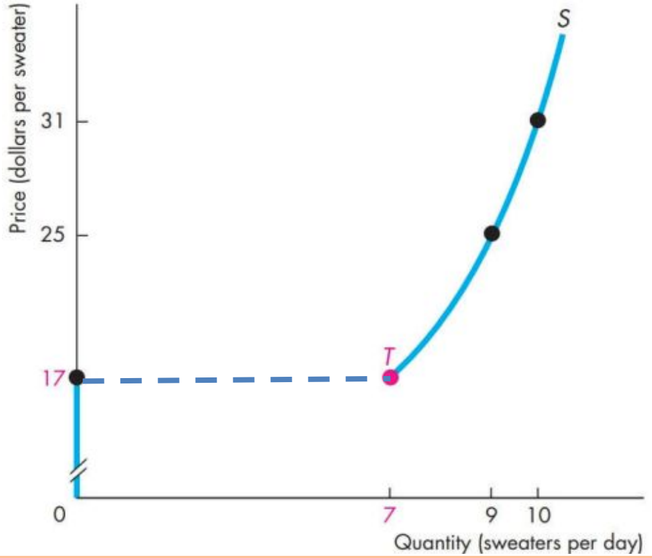
- if P < SD point ⟶ shut down
- if P **>** SD point ⟶ produce along the MC curve because profit maximizing quantity is when MC = MR
- if P = SD point ⟶ indifferent about shutting down and producing

NOTE!

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

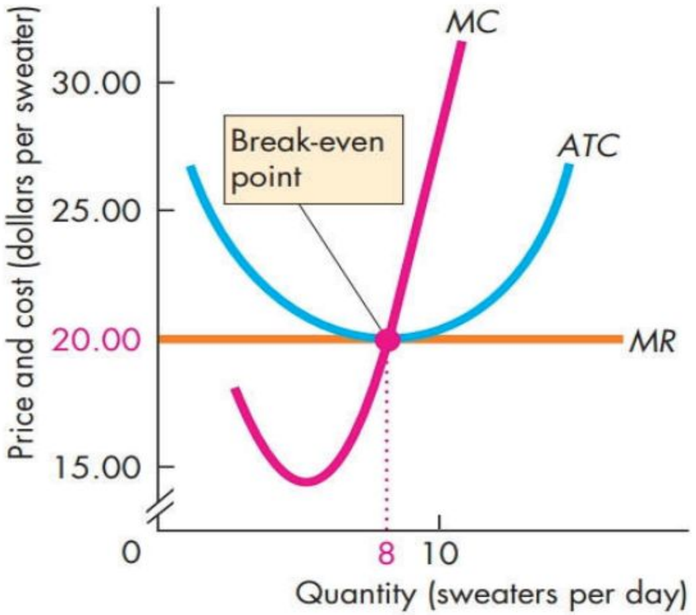
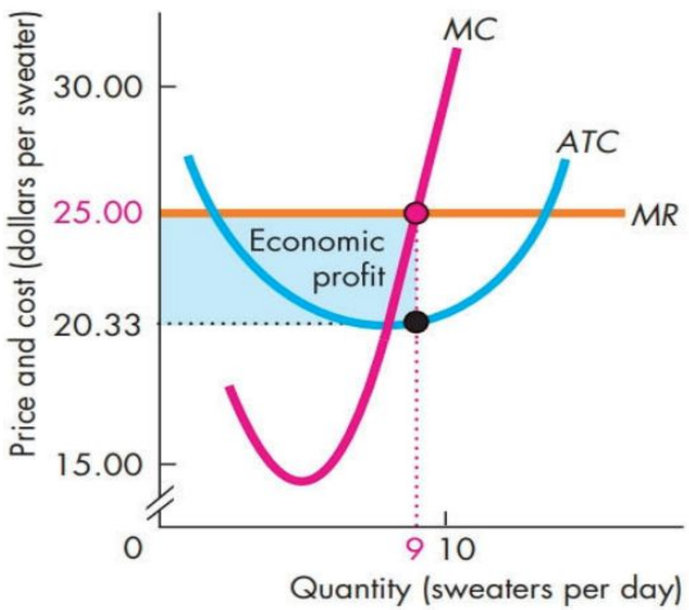
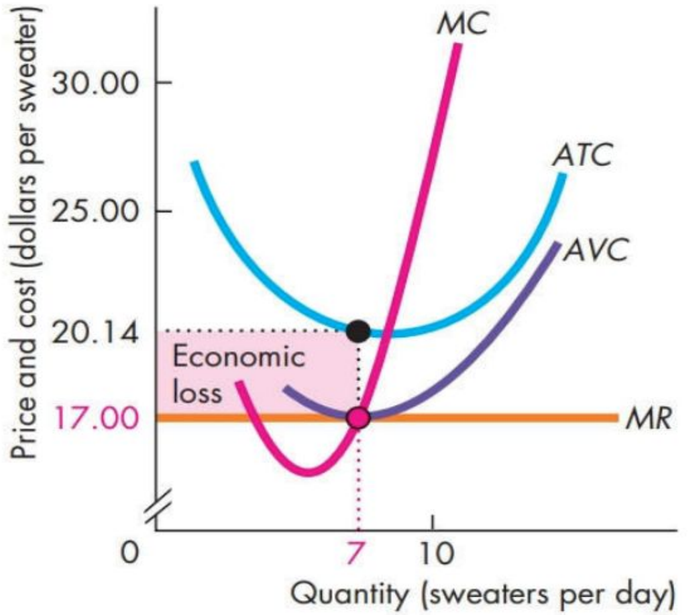


(a) Marginal cost and average variable cost



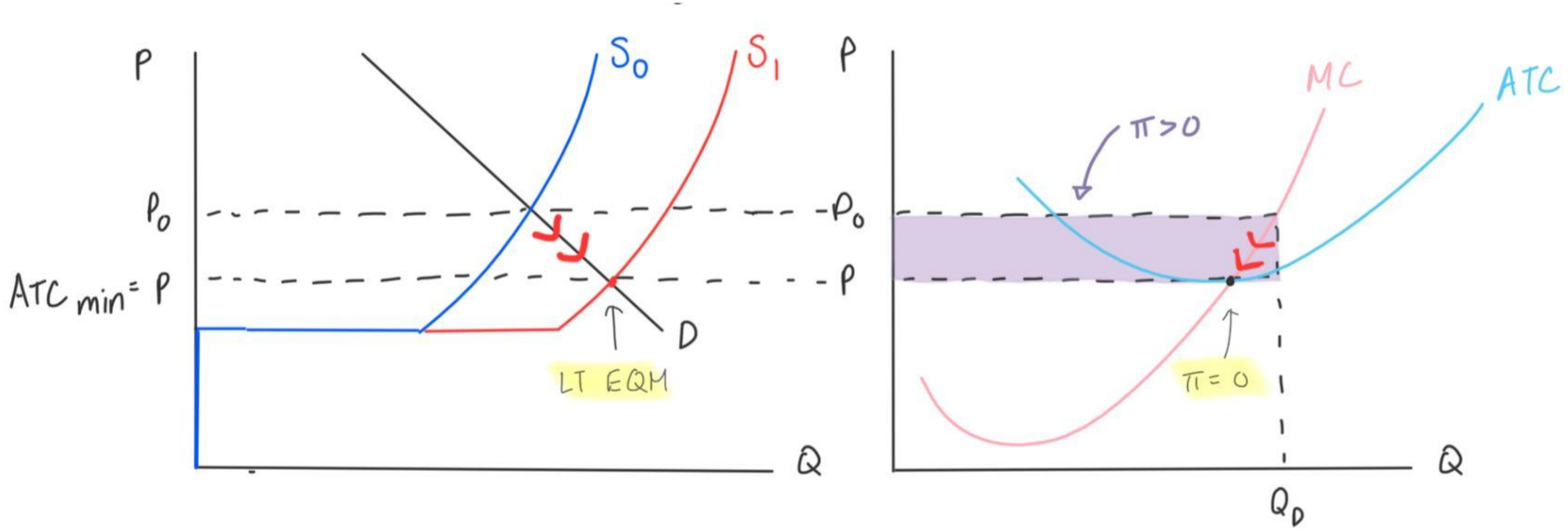
2. Perfect Competition - Short Run

- 3 scenarios in the short run:

Breakeven	Gain Profit, π > 0	Incur a Loss, π < 0
P = ATC (or R = TC)	P > ATC (or R > TC)	P < ATC (or R <TC)
		

2. Perfect Competition - Long Run

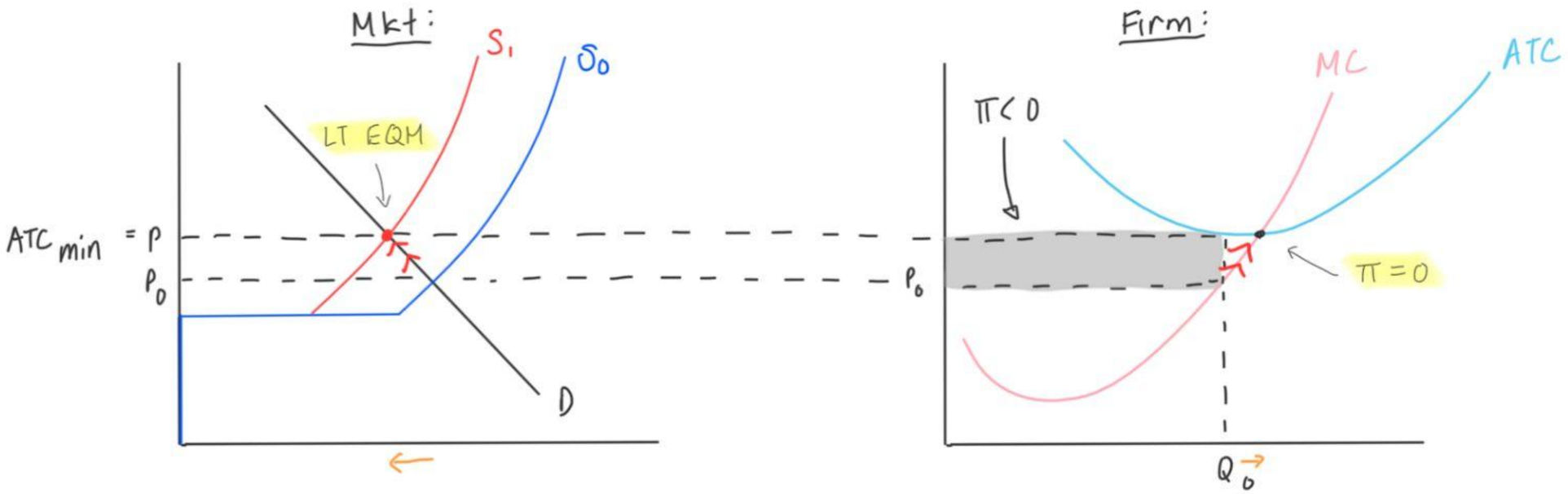
- Entry
  - market P > firm's ATC min ⟶ firm's π > 0 ⟶ new firms enter the market ⟶ market S will increase ⟶ market P will decrease ⟶ existing firm's Q decreases
  - it will continue until P = ATC min and the firm's π = 0
  - BUT the overall market sells more because there are more firms producing Q*



2. Perfect Competition - Long Run

Long run EQM is breakeven, π = 0

- <u>Exit</u>
  - market P < firm's ATC min ⟶ firm's π < 0 ⟶ firms exit the market ⟶ market S will decrease ⟶ market P will increase ⟶ firms no longer make a loss ⟶ existing firm's Q increases
  - it will continue until P = ATC min and the firm's π = 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 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

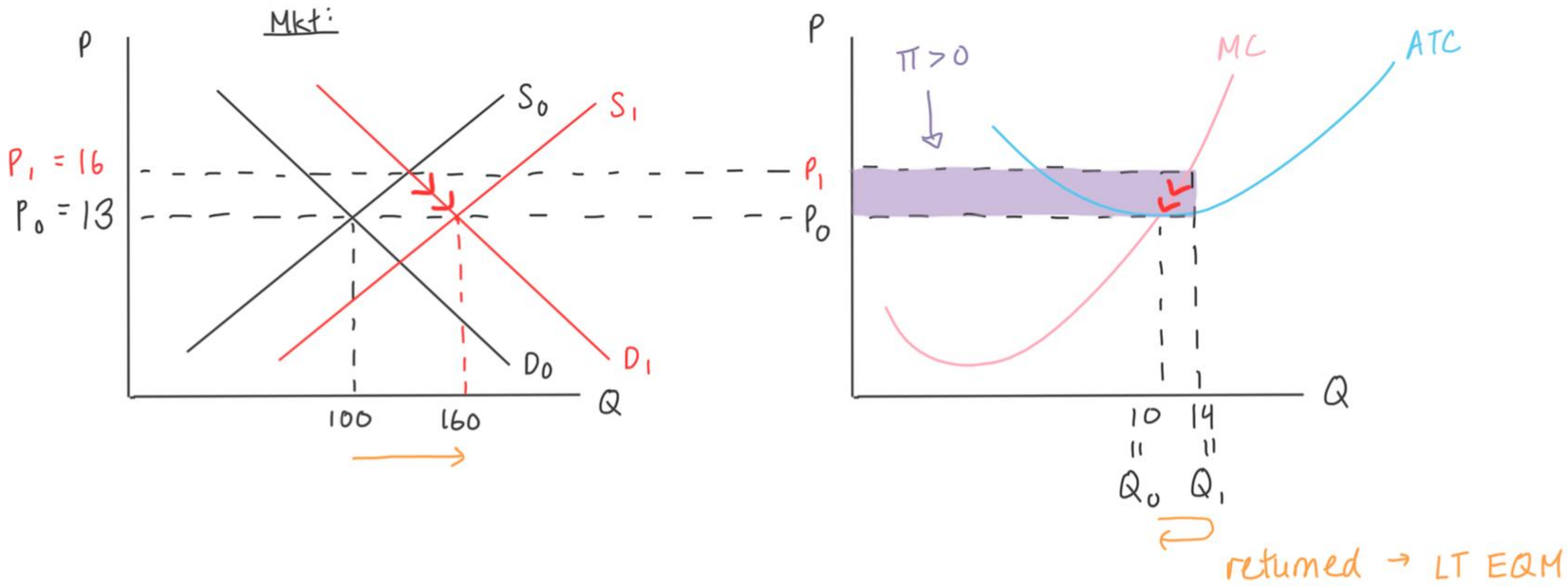
c) firms will temporarily shut down → market supply decreases → market price increases → firms start producing again

d) None of the above

Since we are talking about long run, firms can enter or exit. Since existing firms are currently making a loss, firms will exit the market, leading to decreased supply and increased price until P = ATC min where firms break even.

2. Perfect Competition - Permanent Change in Demand

- <u>Demand increases</u>
  - originally at long run EQM ⟶ demand curve shifts right ⟶ P increases, P > firm's ATC min, π > 0 ⟶ existing firms produce more, firms enter market ⟶ market S increases ⟶ market P decreases ⟶ each firm produces less
  - Continue until P = ATC min and the firm's π = 0
  - Result: more firms produce the equilibrium Q because firms entered

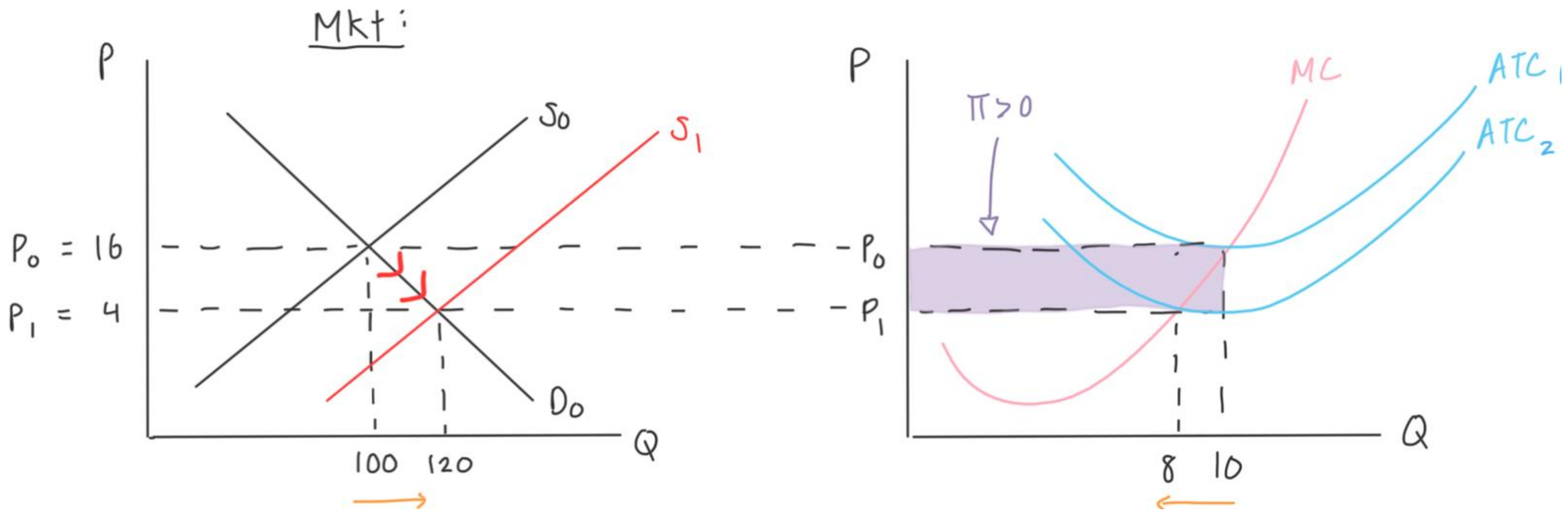


Before: each firm produces 10 units & 100 units are produced in total ⟶ 10 firms

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

2. Perfect Competition - Permanent Change in Supply

- <u>Technology improves</u>
  - originally at long run EQM → ATC decreases, π > 0 → firms with the new technology enters the market, firms with the old technology switches to the new technology or exit the market → market S increases → market P decreases → firm's Q decreases
  - Continue until P = $ATC_{2\ min}$ and π = 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 8 units & 120 units are produced in total → 15 firms

3. Monopoly

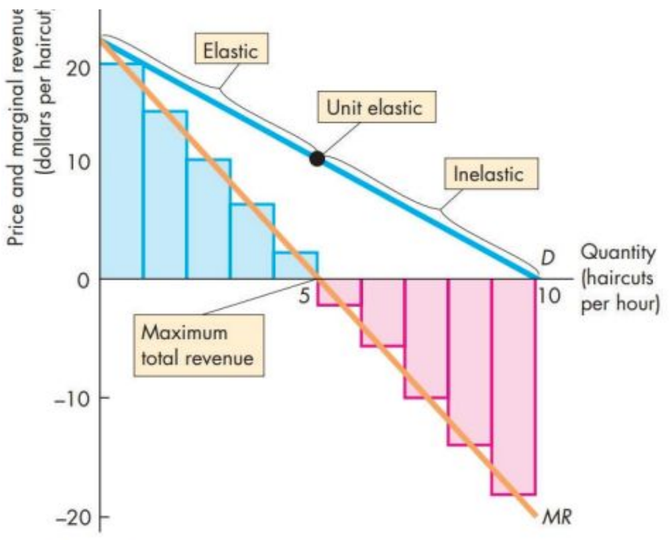
- **Monopoly:** market where,
    1. there are no close substitutes
    2. **high barriers to entry:** constraints that protects the firm from potential competitors
        - **natural monopoly:** the firm can produce at such low costs (economies of scale) that they can supply the entire market
        - **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)

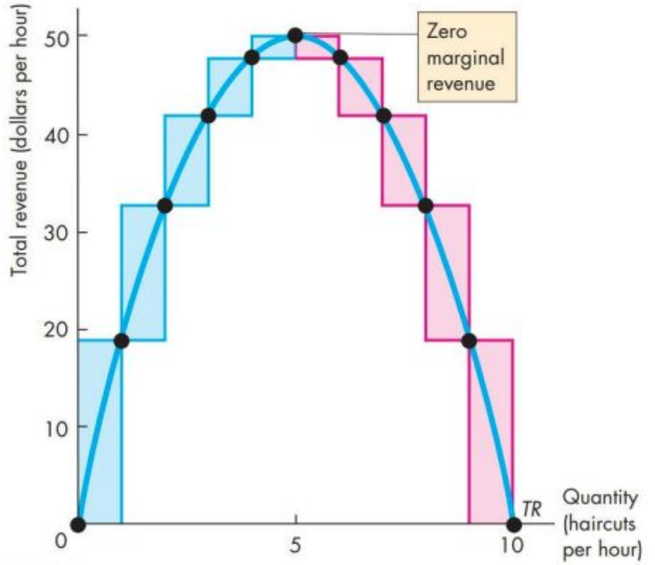
- **Single Price Monopoly:** when the monopoly firm sells each unit of output at the same price to everyone
- **price setter:** they set and highly influence the price
- market demand = demand for the monopoly's product
- must set a lower P in order to sell more
    - P always > MR because when you lower 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 <u>elastic</u>
  - 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



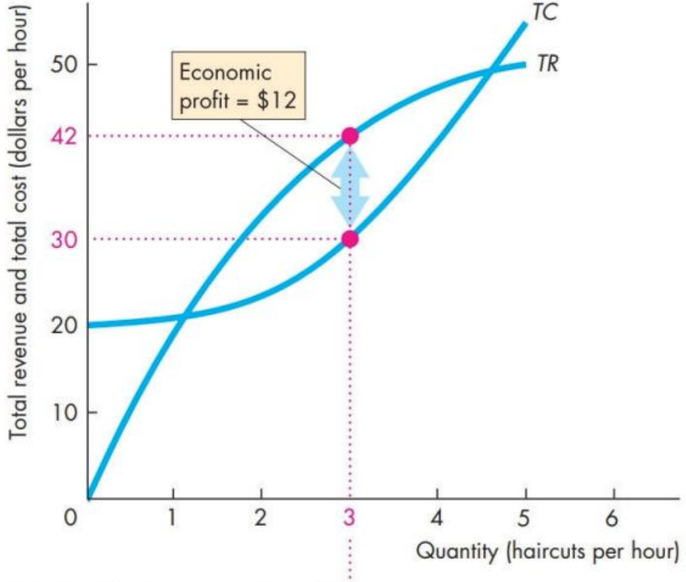
(b) Total revenue curve

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

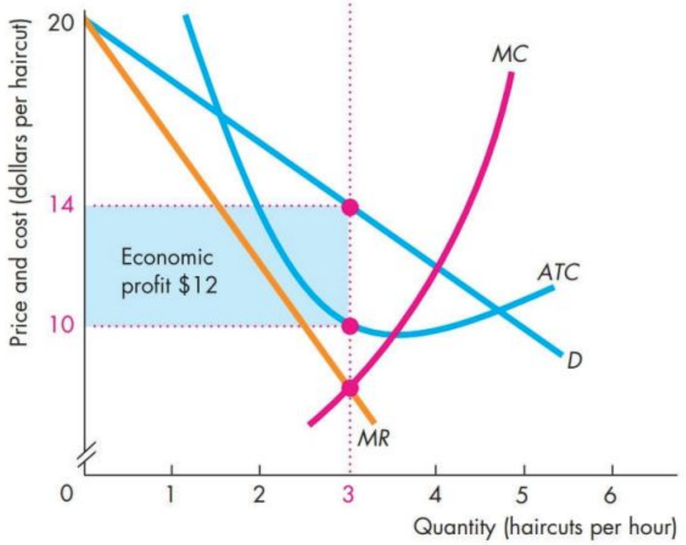
- in a monopoly, the profit maximizing quantity is still where MR = MC
- MR's slope = double the demand function's slope
  - P = 20 – 2Q
  - MR = 20 – 4Q

<u>Steps to solving Monopoly problems:</u>

1. Find the MR function
2. Set MR = MC to solve for the profit maximizing quantity
3. Plug the profit maximizing quantity in the demand function to solve for the monopoly price
4. Calculate the profit
5. Calculate the DWL



(a) Total revenue and total cost curves



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?

P = 32 – 4Q

b. What is the profit maximizing quantity and price?

To find the profit maximizing quantity, set MR = MC:

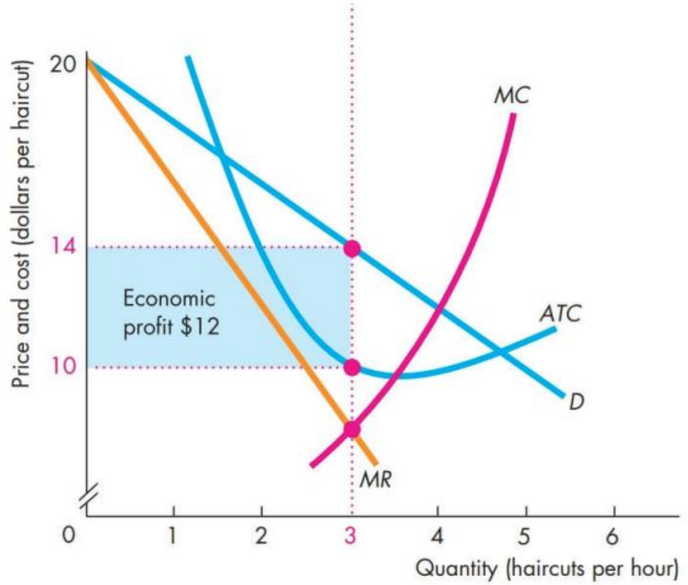
$32 - 4Q = 4$, $Q_{\text{profit maximizing}} = 7$

To find the price, substitute the profit maximizing quantity in the demand function:

$P = 32 - 2Q_{\text{profit maximizing}}$, $P = \$18$

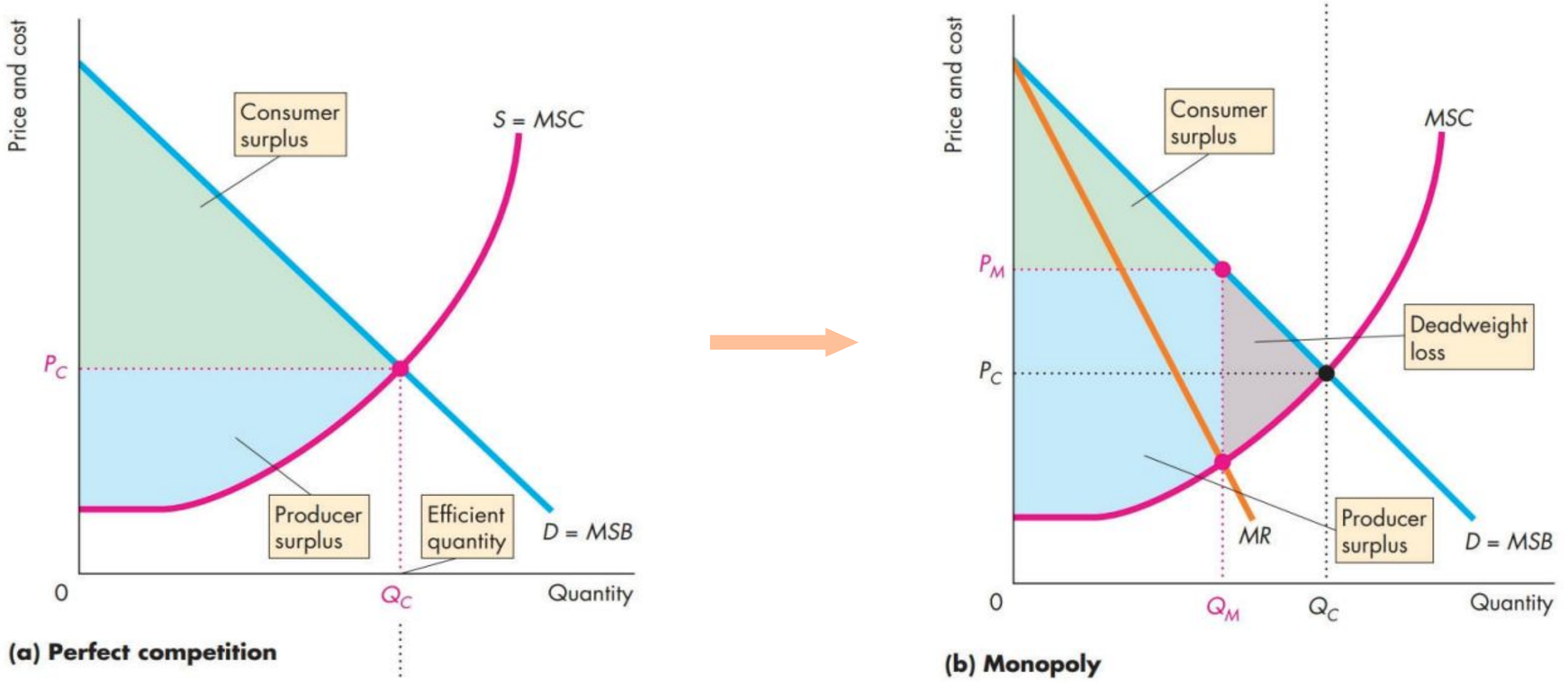
c. If their ATC = 6, what's their profit?

Profit = Q(P – ATC) = 7(18 – 6) = $84



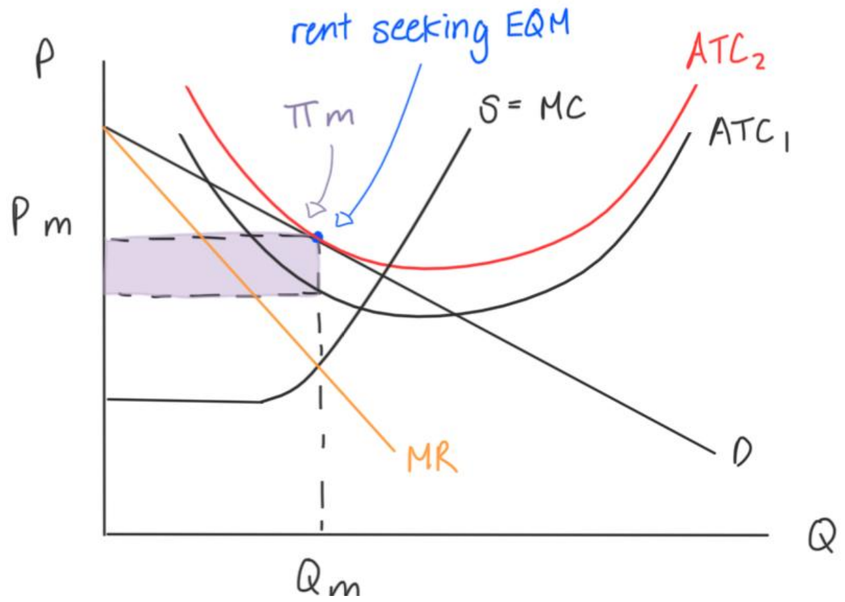
3. Single Price Monopoly vs. Perfect Competition

- 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

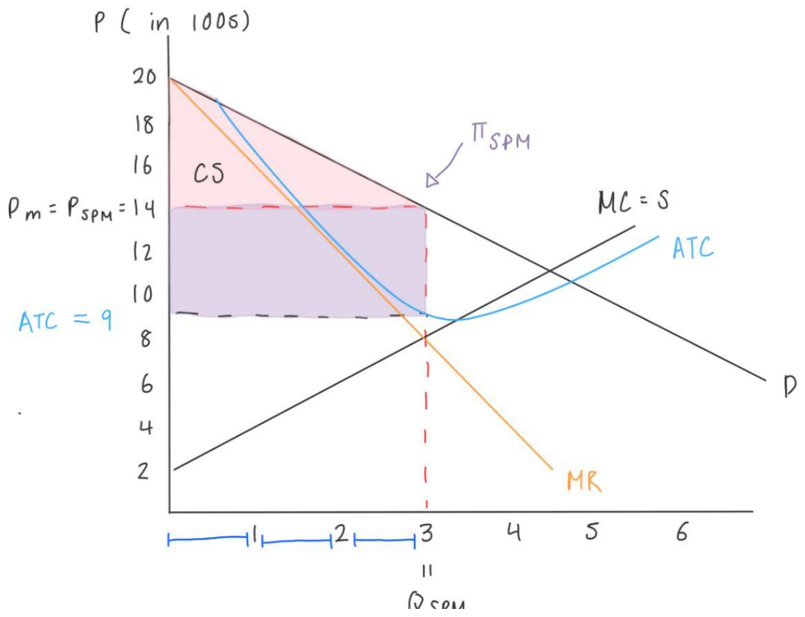
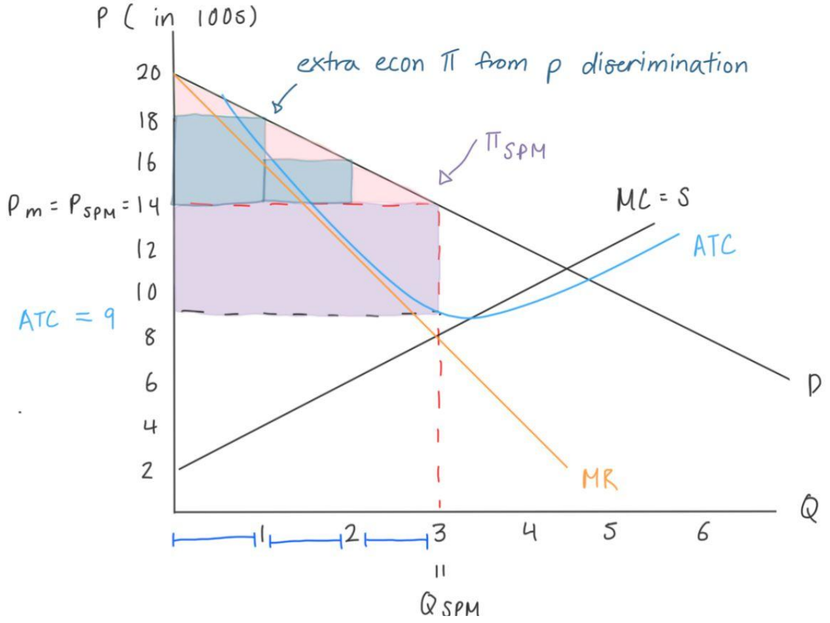
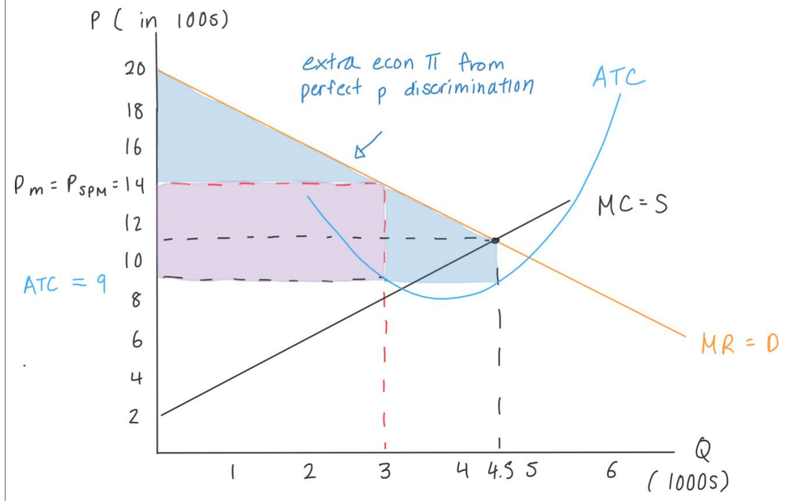


3. Monopoly Price-Setting - Discriminating Price Monopoly (DPM)

- **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 identity 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

SPM	DPM	Perfect DPM
Charge the highest P people would pay at Qπ max	Charge every <u>batch</u> of units at the highest P people would pay	**perfect price discrimination:** Charge <u>every</u> unit at highest P people would pay
		

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

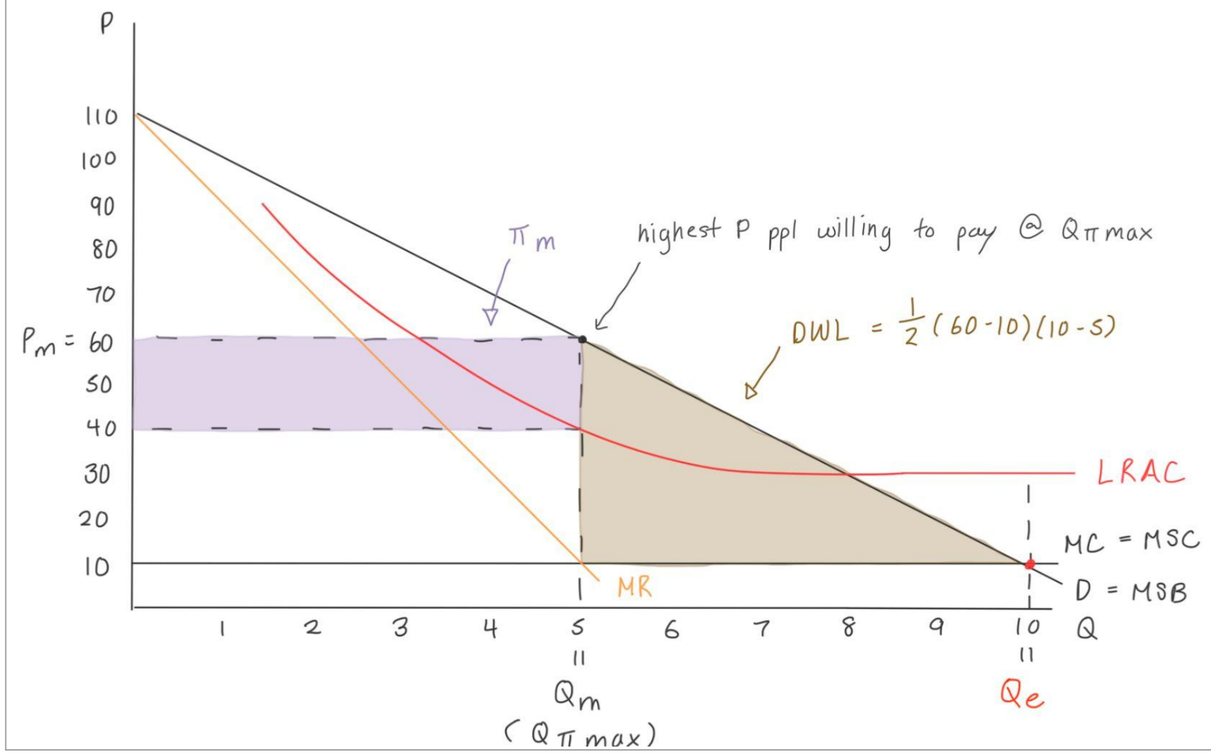
- **regulation:** rule set by the government that's meant to influence the P, Q, and/or entry
- 2 theories about how regulations work:
  - **social interest theory: political** & regulatory processes seek out inefficiency and tries to eliminate DWL
  - **capture theory:** serves the producer's self-interest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

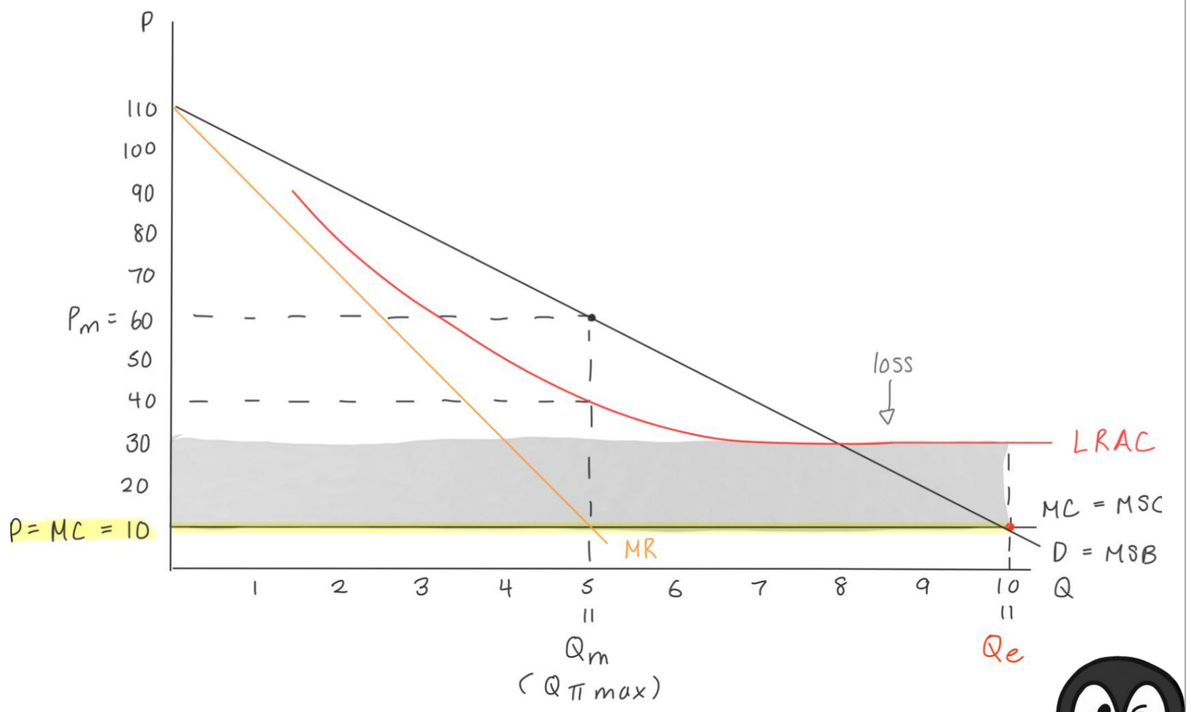
<u>For Natural Monopoly:</u>

- **marginal cost pricing rule:** set P = MC
  - when P = MC, Qe = Qd
  - forces natural monopolies to produce Qe

3. Monopoly Regulation - Marginal Cost Pricing Rule

Unregulated	Regulated
- Charge the highest P that people are willing to pay at Qπ max - The firm earns profit but it creates DWL	- Set P = MC - The firm produces Qe, no DWL, but they incur a loss





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

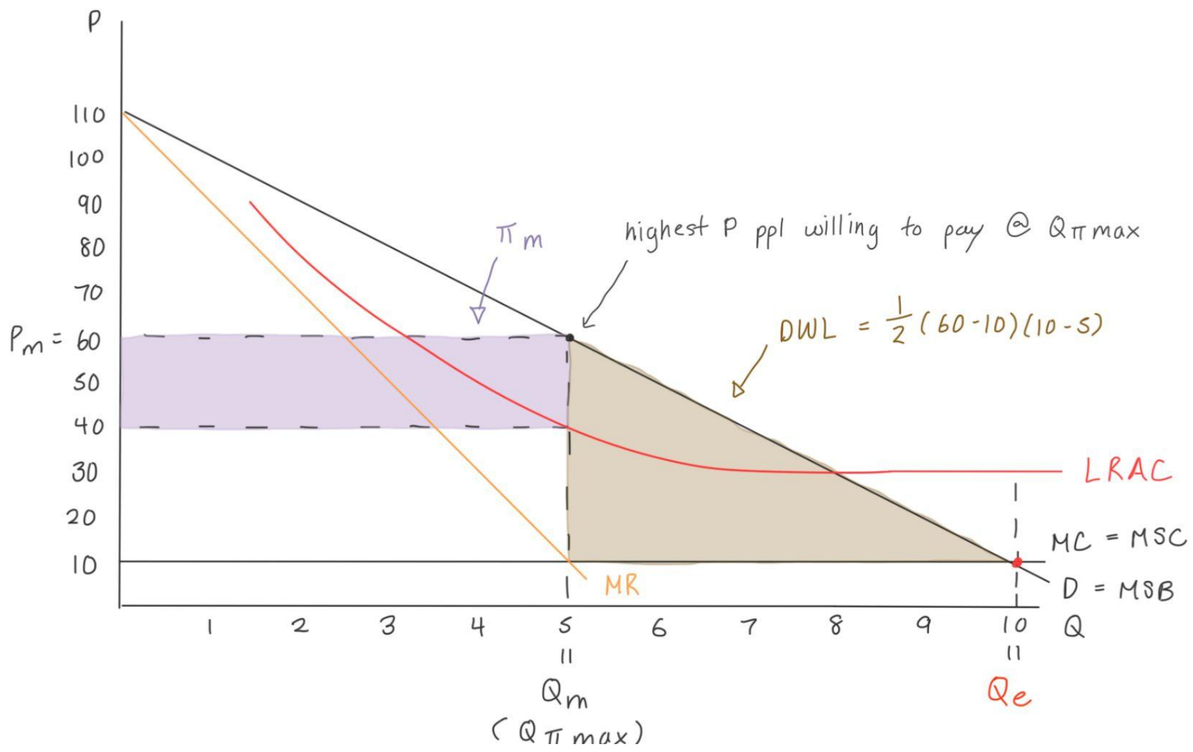
3. Monopoly Regulation - Average Cost Pricing Rule

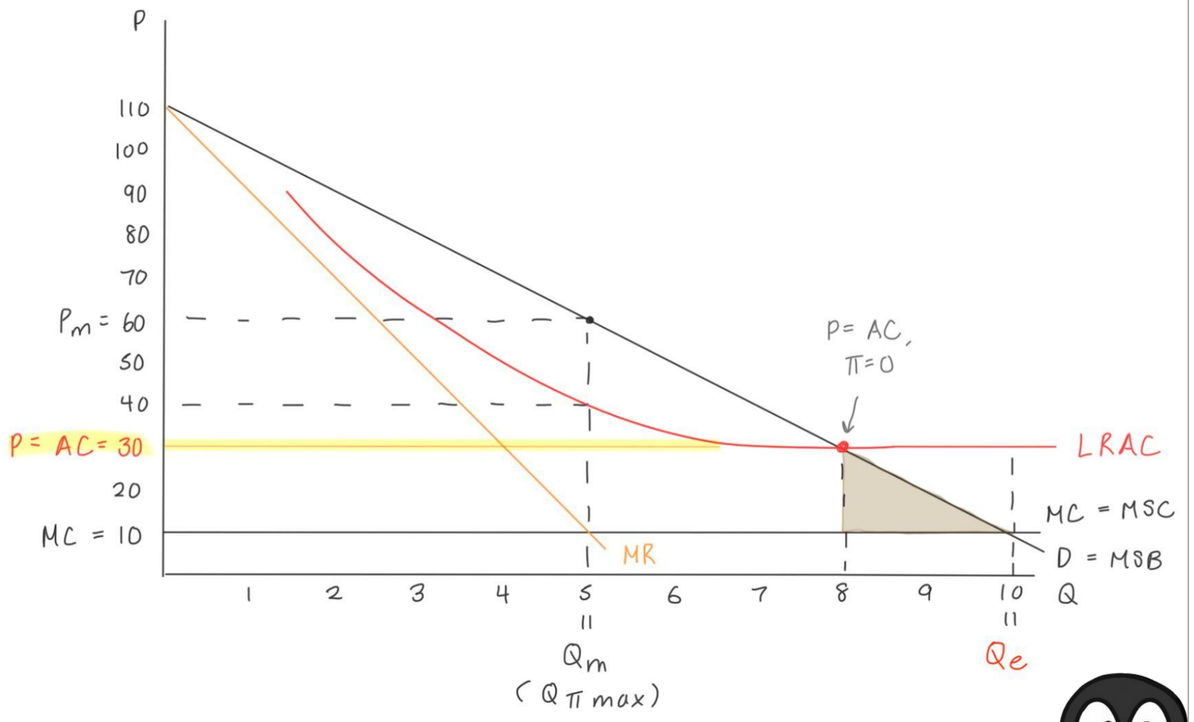
For Natural Monopoly:

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

3. Monopoly Regulation - Average Cost Pricing Rule

Unregulated	Regulated
- Charge the highest P that people are willing to pay at Qπ max - The firm earns profit but it creates DWL	- Set P = AC - producing closer to Qe, still inefficient but smaller DWL, no loss



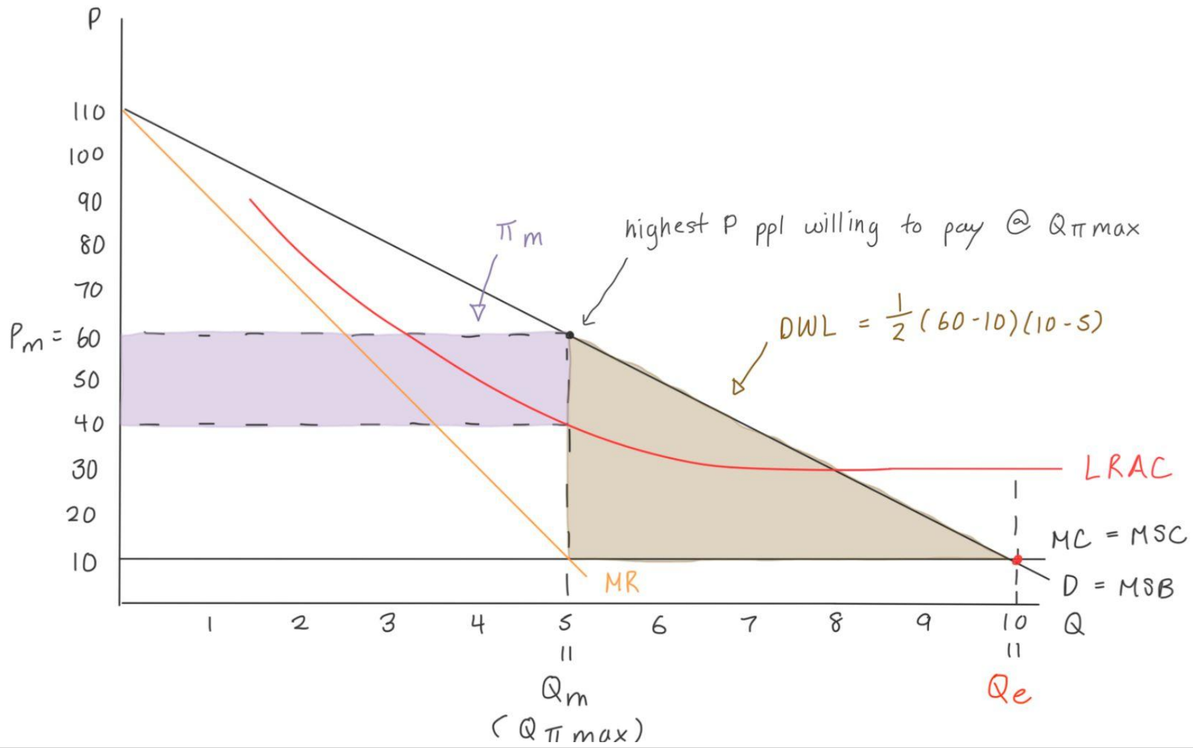


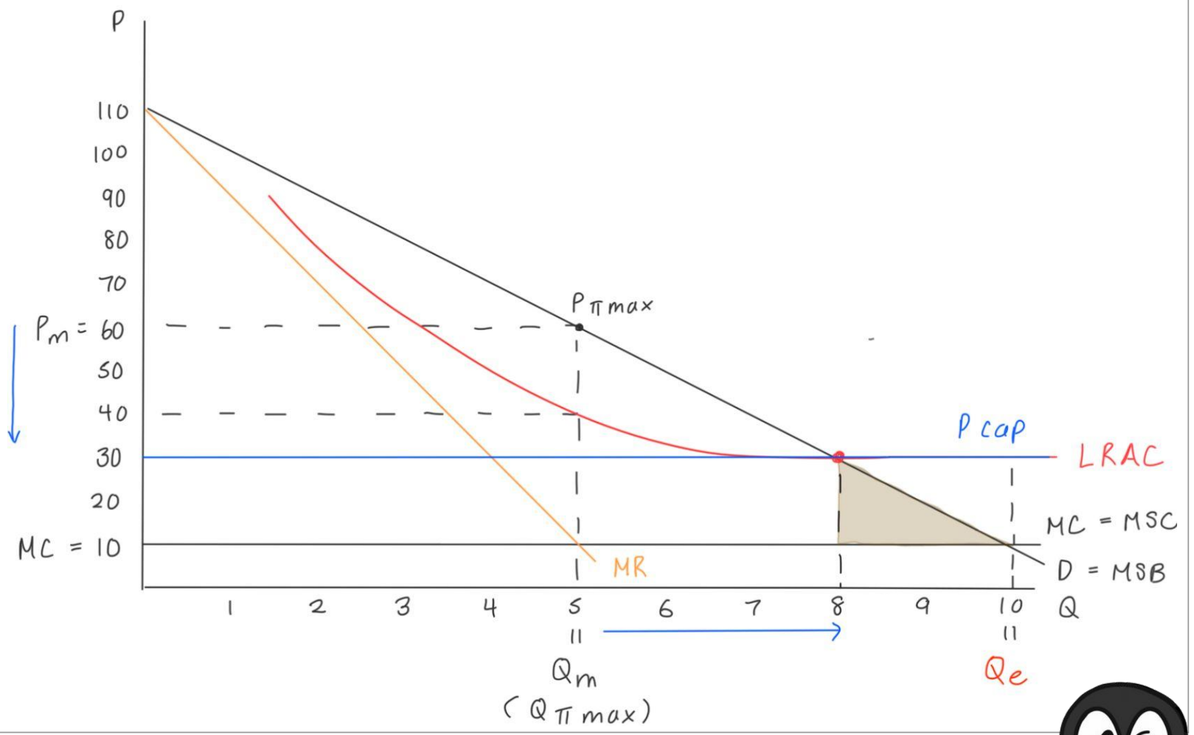
3. Monopoly Regulation - Rate of Return Regulation, Price Ceiling

- **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

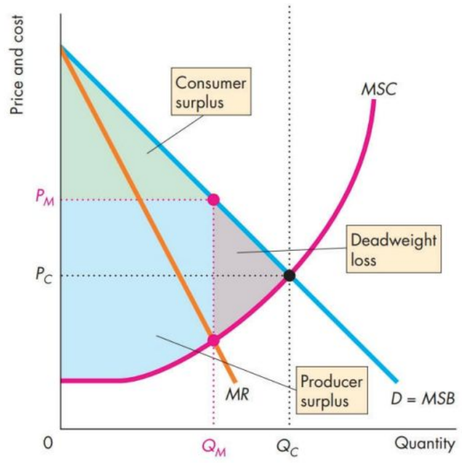
Unregulated	Regulated
- Charge the highest P that people are willing to pay at Qπ max - The firm earns profit but it creates DWL	- Set Price Ceiling - producing closer to Qe, still inefficient but smaller DWL, no loss





3. Perfect Competition vs. Monopoly

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

1. Many buyers & 2 sellers (Neither)
2. No barriers to entry (Perfect Competition)
3. P = MC (Perfect Competition)
4. There are no close substitutes (Monopoly)
5. 

(Monopoly)

PART 2

TABLE OF CONTENTS

Part 1:

- Externalities
- Perfect Competition
- Monopoly

Part 2:

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

Part 3:

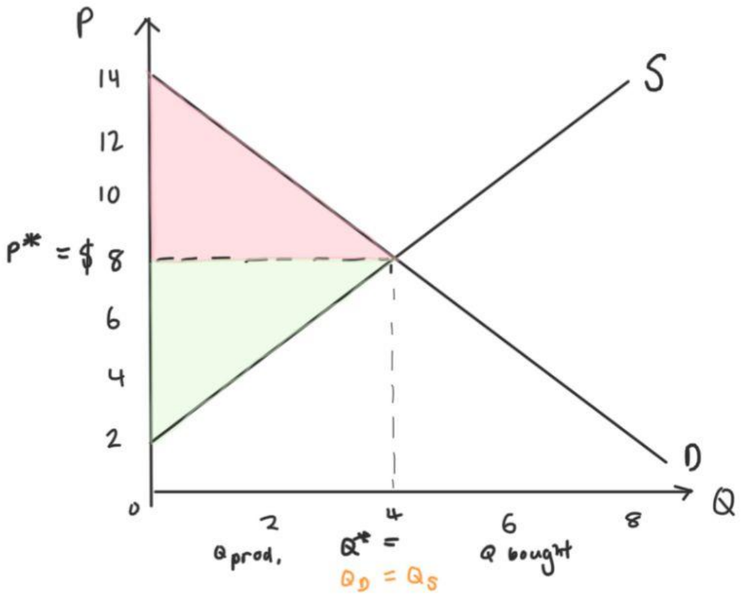
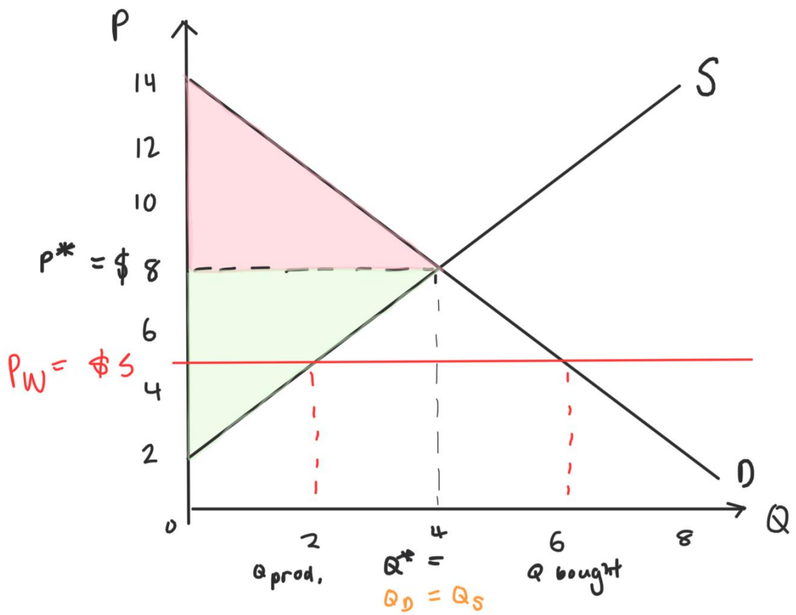
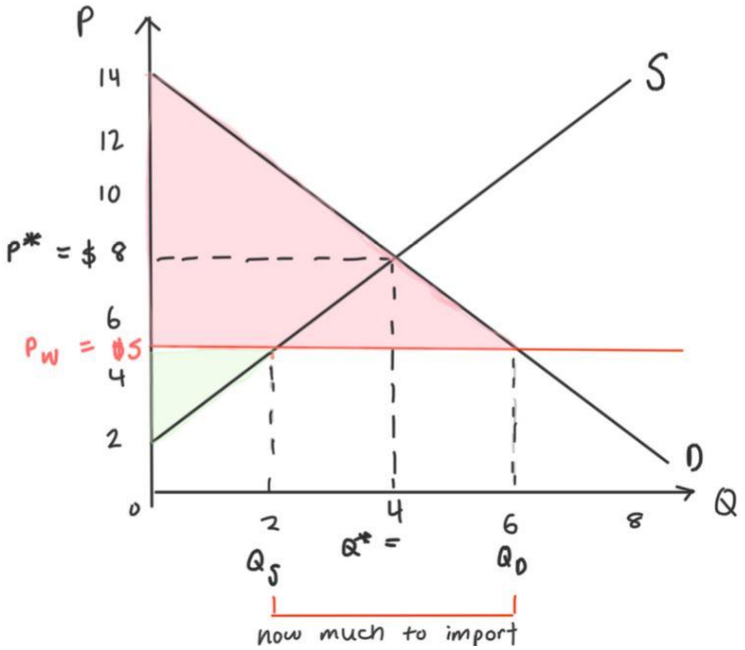
- What is Economics
- PPF, Gains from Trade
- Demand & Supply
- Elasticity
- Surplus & Efficiency

Newest to oldest

4. Global Market in Action

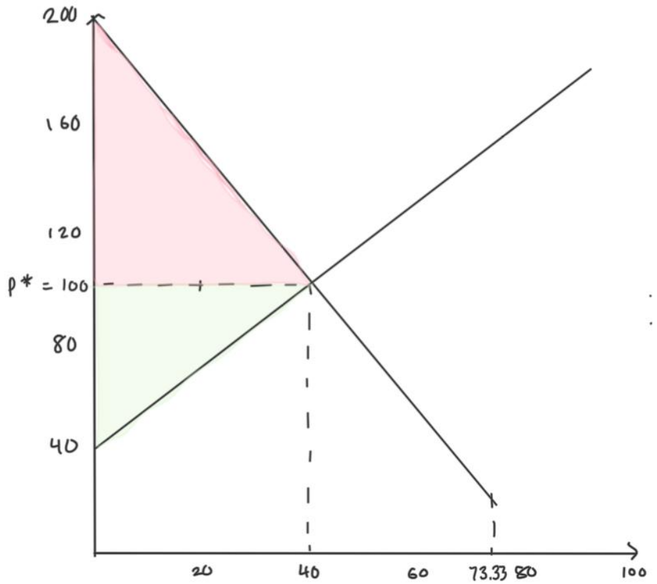
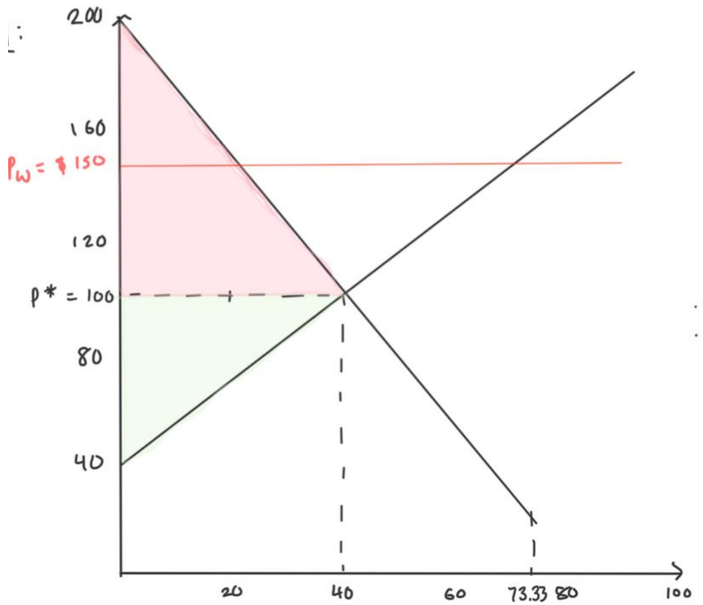
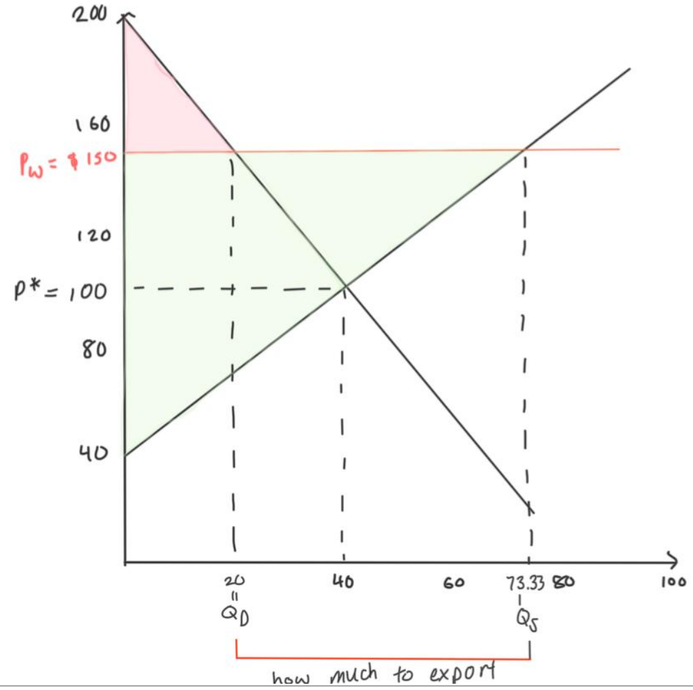
- **national comparative advantage** (a nation can produce a good/service at a lower OC than any other nation) > trade
  - **imports**: buy goods/services from other countries
  - **exports**: sell goods/services to other countries
- 6 Possible Situations:
  1. No trade
  2. Free trade where the world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

4. Global Market in Action - No Trade ⟶ Importing

No Trade		Trade (Import)
- market is in EQM	- Pw < P*	- Demand > Supply ⟶ shortage ⟶ import
		

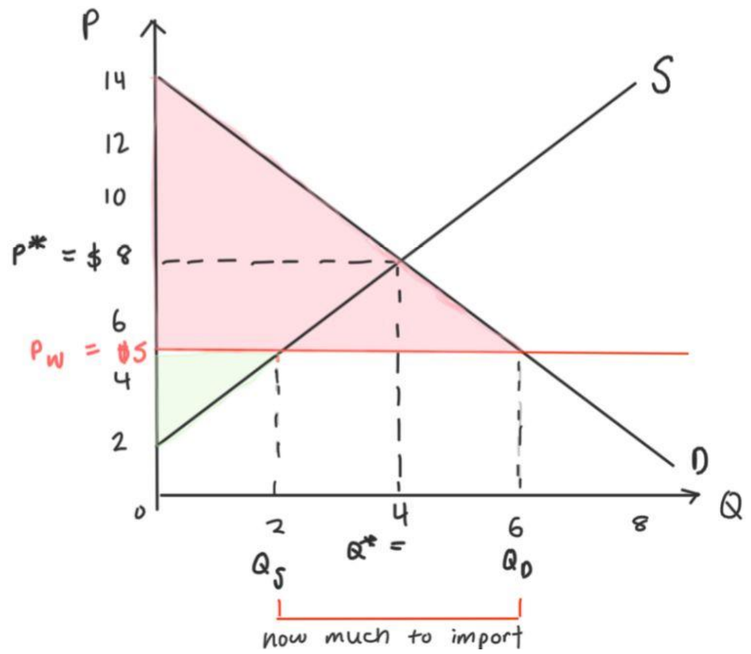
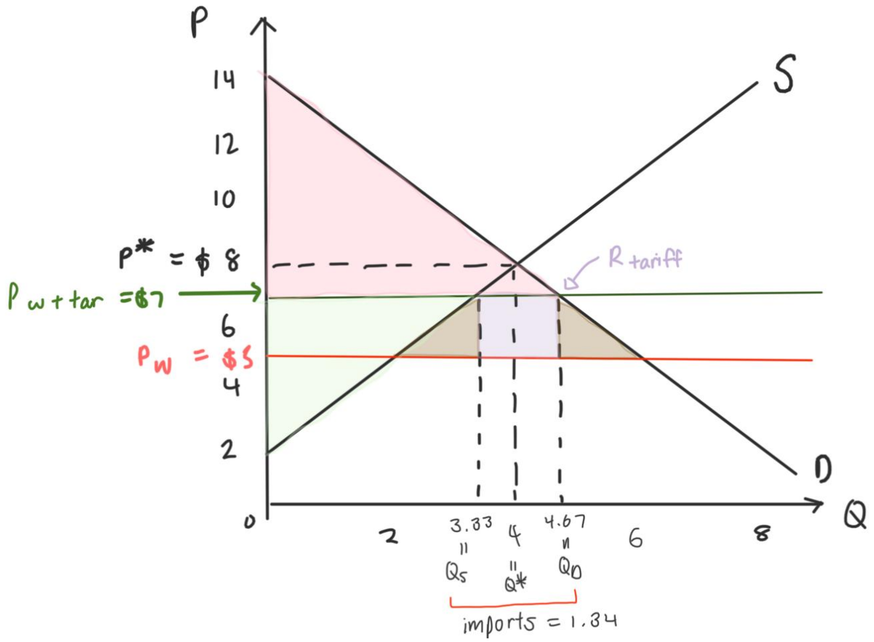
Consumers gain, producers lose

4. Global Market in Action - No Trade ⟶ Exporting

No Trade		Trade (Export)
- market is in EQM	- Pw > P*	- Supply > Demand ⟶ surplus ⟶ export
		

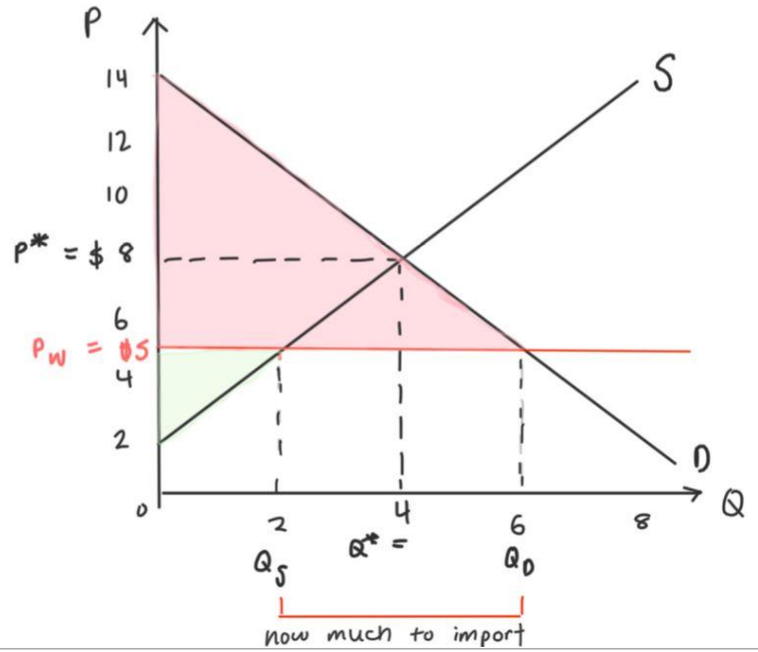
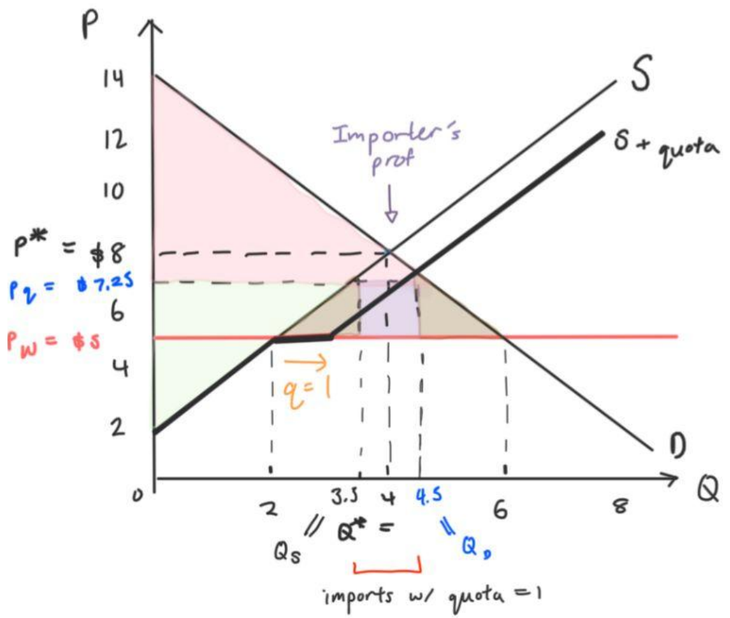
Producers gain, consumers lose

4. Global Market in Action - Tariffs on Imports

Import	Tariffs on Imports
- Consumers import an amount that's equal to the shortage	- **tariff:** when the importing country puts a tax on imported goods - Eg. the government implements $2 tariff per unit of the good
	

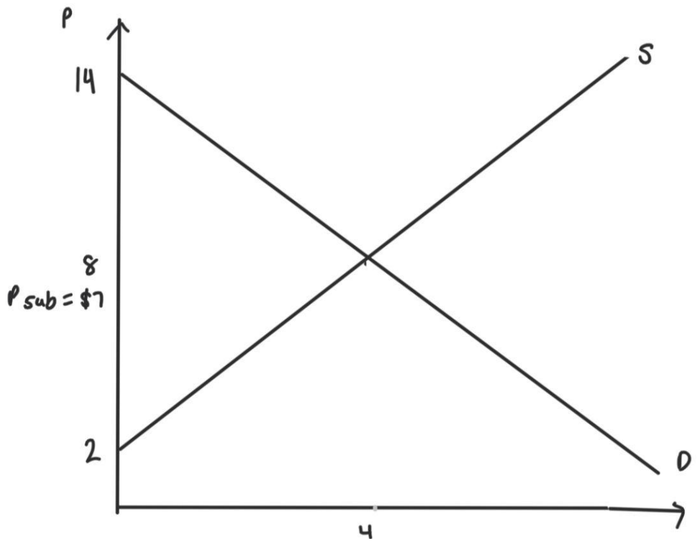
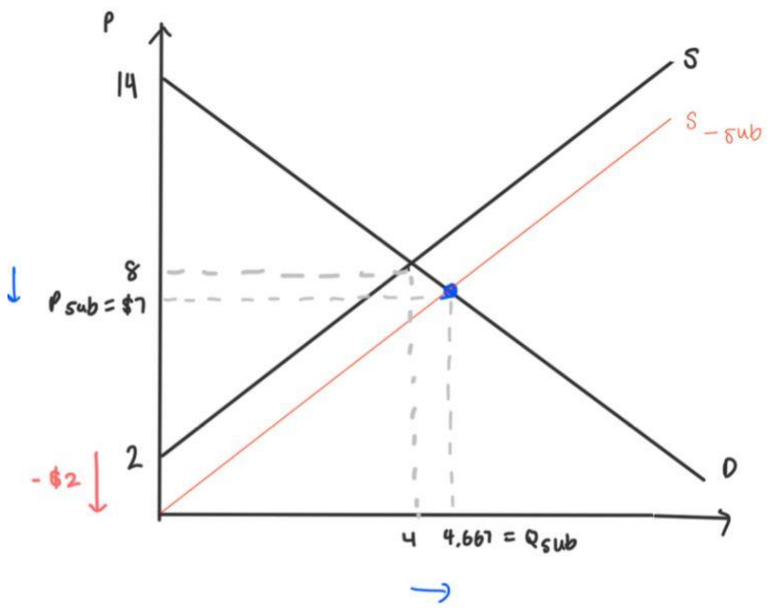
Consumers lose, producers gain, government gains, society as a whole lose

4. Global Market in Action - Quota on Imports

Import	Quota on Imports
- Consumers import an amount that's equal to the shortage	- **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
	

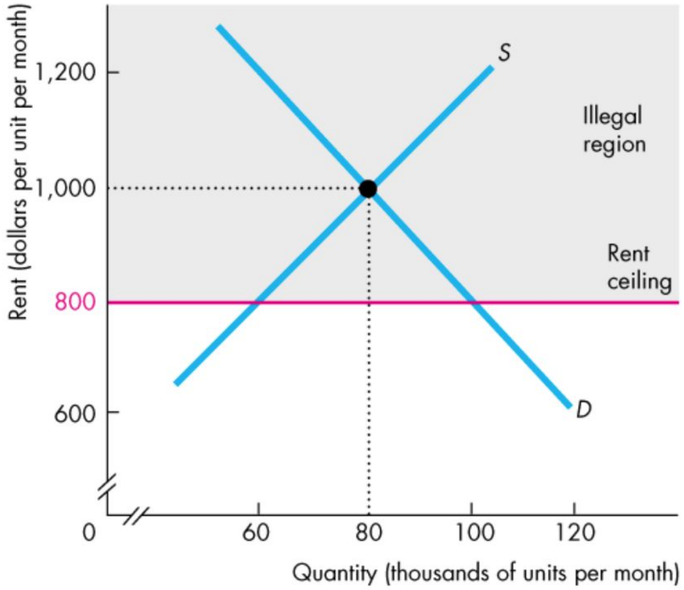
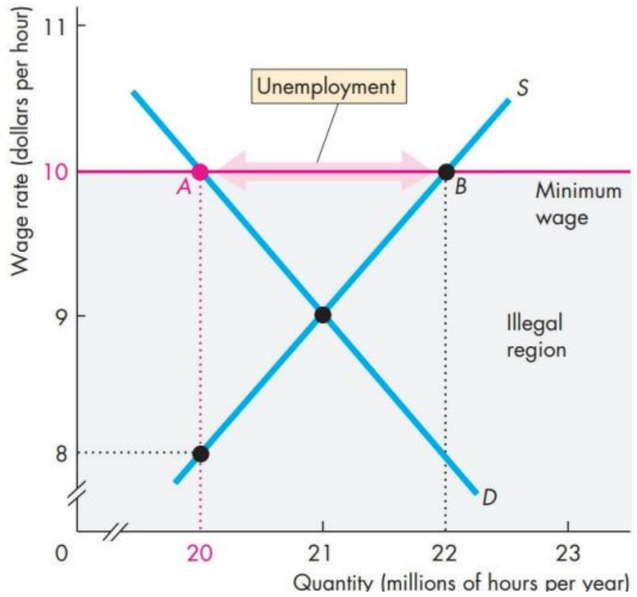
Consumers lose, producers gain, importer gains, society as a whole lose

4. Global Market in Action - Export Subsidy

No Trade	Export Subsidy
- market is in EQM	- **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
	

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
- **Price ceiling:** illegal to charge above a certain price - Price ceiling < P* - D > S ⟶ shortages ⟶ underproduction - Eg. Rent market	- **Price floor:** illegal to charge below a certain price - Price floor > P* - S > D ⟶ surplus ⟶ underproduction - Eg. Labour market
	

both consumers and producers lose

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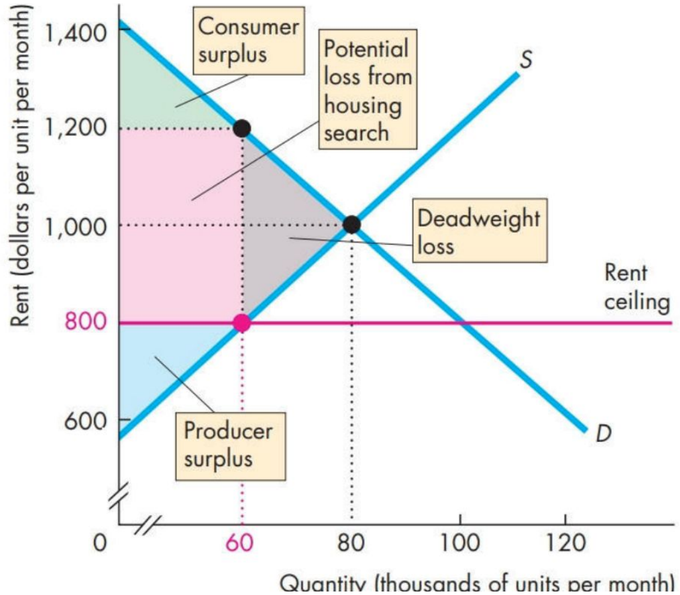
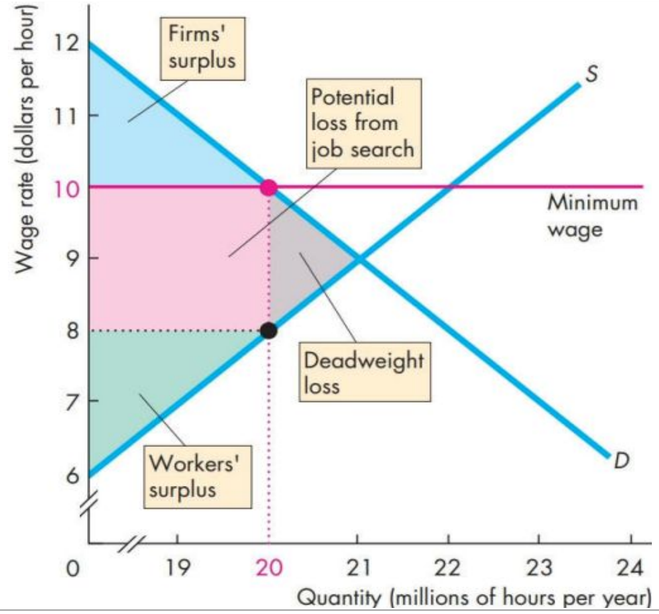
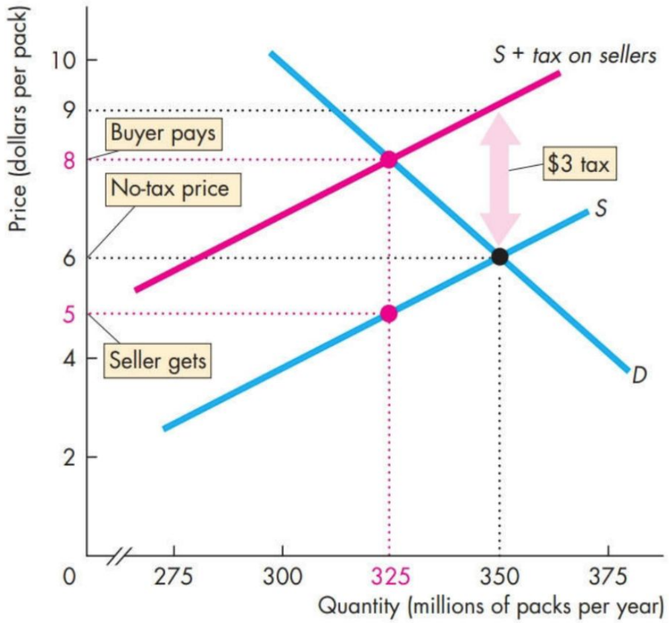
	

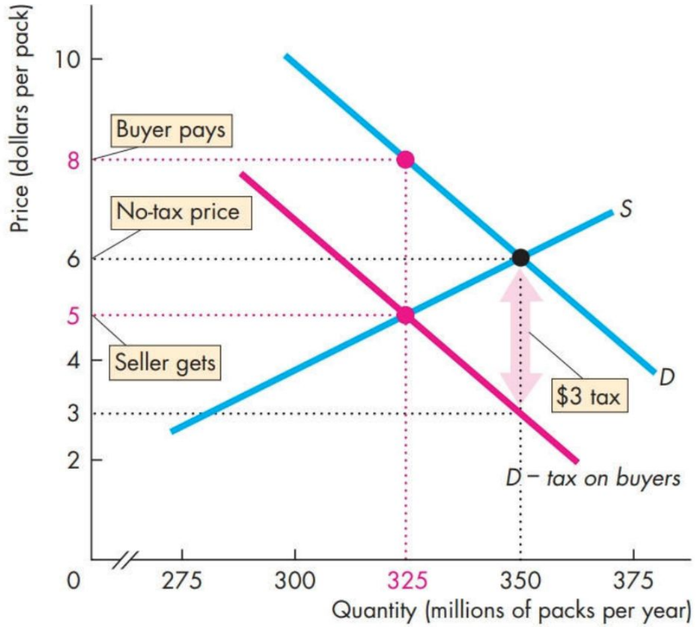
both consumers and producers lose

5. Government Actions in Market - Taxes

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

Tax on seller	Tax on buyer
- costs rise ⟶ supply curve shifts to ***S + tax*** on sellers	- the amount the buyer is willing to pay the seller decreases ⟶ demand curve shifts to ***D – tax*** on buyers





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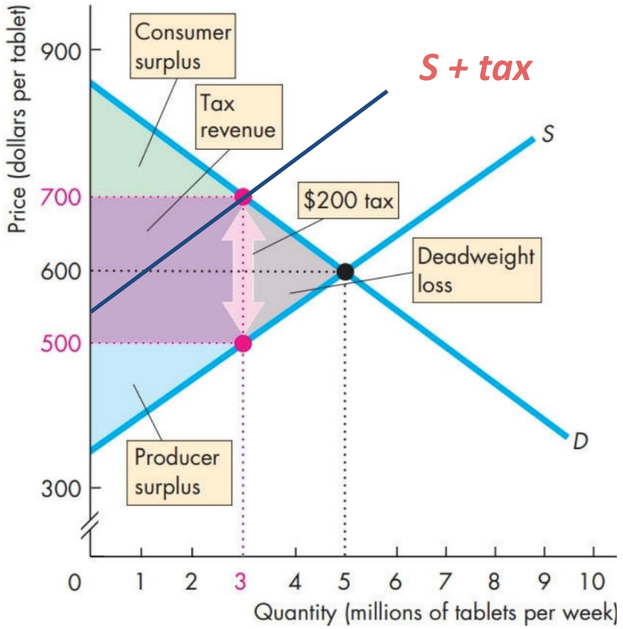
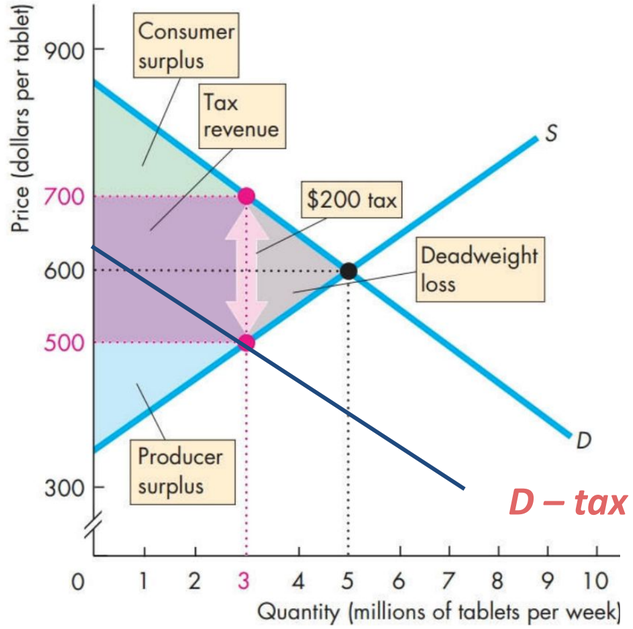




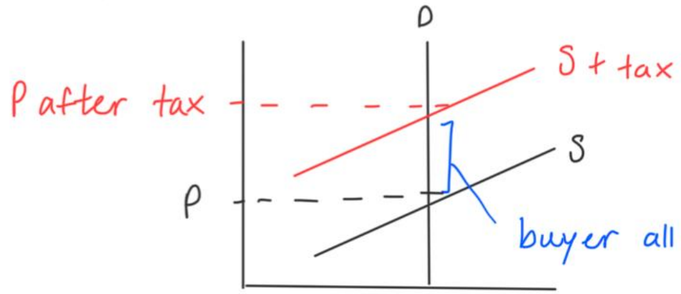
both consumers and producers lose

5. Government Actions in Market - Taxes

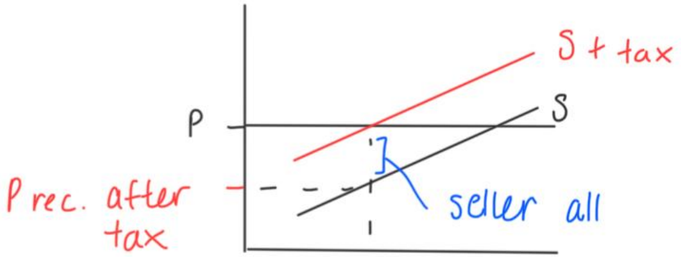
The more inelastic ed is, the higher the buyer's share of taxes

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

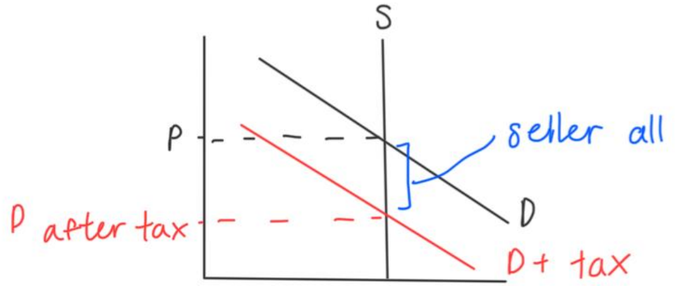
1) Perfectly Inel. D:



2) Perfectly El. D:



3) Perfectly Inel. S:



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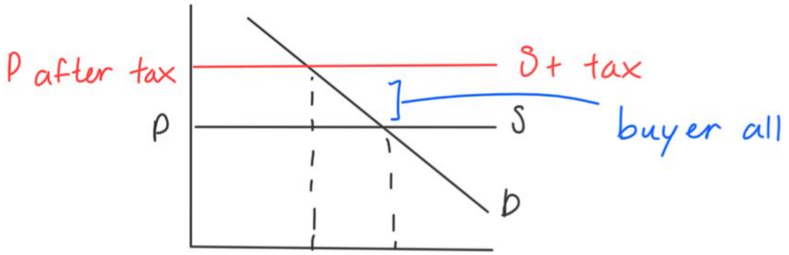
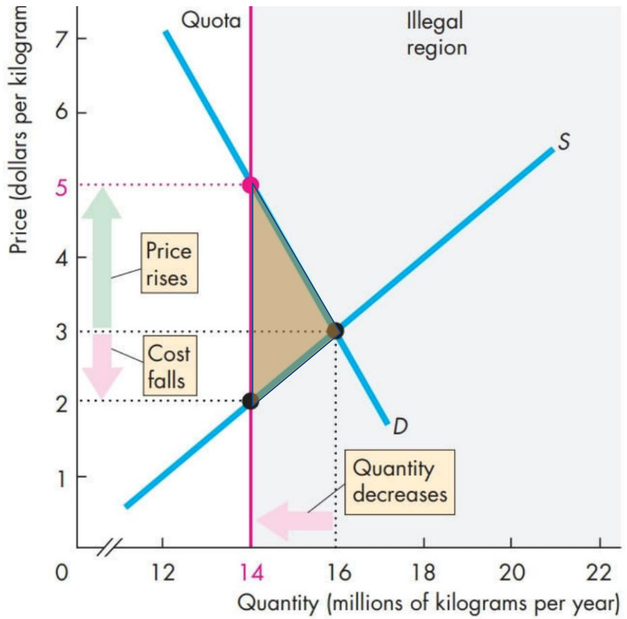
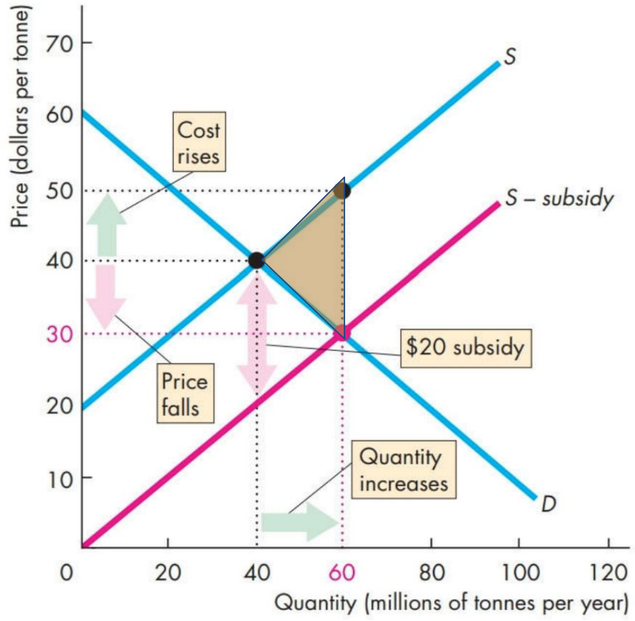


5. Government Actions in Market - Production Quota, Subsidy

Production Quota	Subsidy
- **production quota**: limits how much can be produced - Production quota < Q* - increases P, decreases Q ⟶ underproduction - eg. cigarette market	- **subsidy:** government sponsors production - costs decrease ⟶ supply curve shifts to ***S – subsidy*** - decreases P, increases Q ⟶ 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)	Long Run (LR)
- **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 <u>reversible</u> - can only increase output by increasing <u>labour</u>	- **long run (LR)**: time frame where the quantities of ALL resources used in production can vary - decisions are <u>irreversible</u> - can increase output by increasing <u>labour</u> &/or <u>plant</u> - **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

Labor (workers per day)	Output (sweaters per day)			
	Plant 1	Plant 2	Plant 3	Plant 4
1	4	10	13	15
2	10	15	18	20
3	13	18	22	24
4	15	20	24	26
5	16	21	25	27
Knitting machines	1	2	3	4

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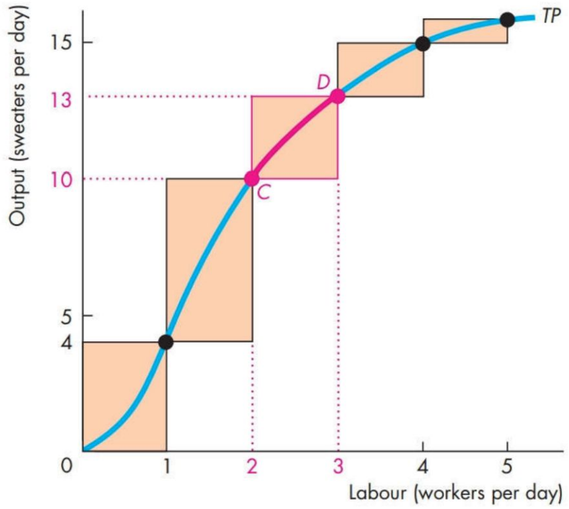
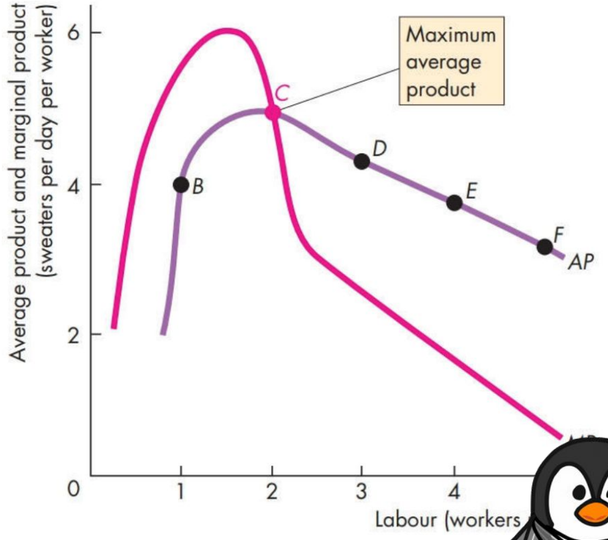
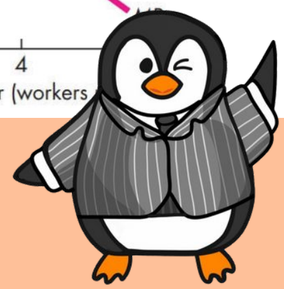
Knitting machines	1	2	3	4

6. Output & Costs - Product Curves

Total Product (TP)	Marginal Product (MP)	Average Product (AP)
- **TP:** total output produced	- **MP:** how much output changes with 1 more unit of labour	- **AP:** TP / # of units of labour
- increases quickly at first, eventually slows down	- **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	- MP > AP ⟶ AP increases - MP < AP ⟶ AP decreases - MP = AP ⟶ AP is at maximum

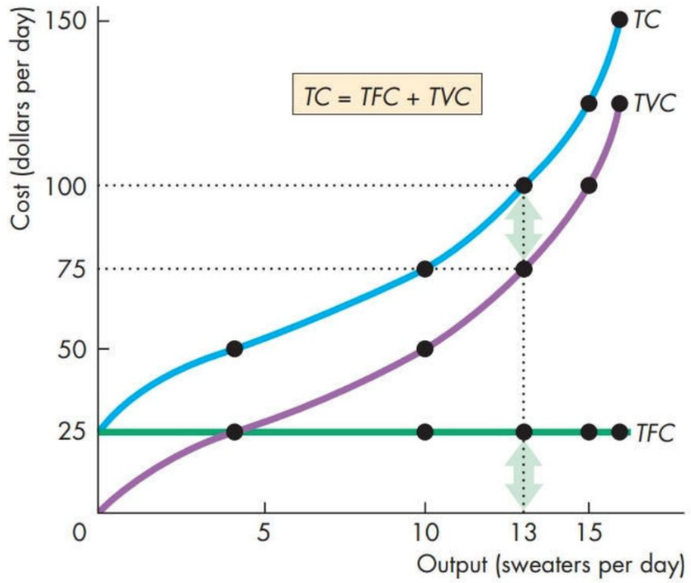






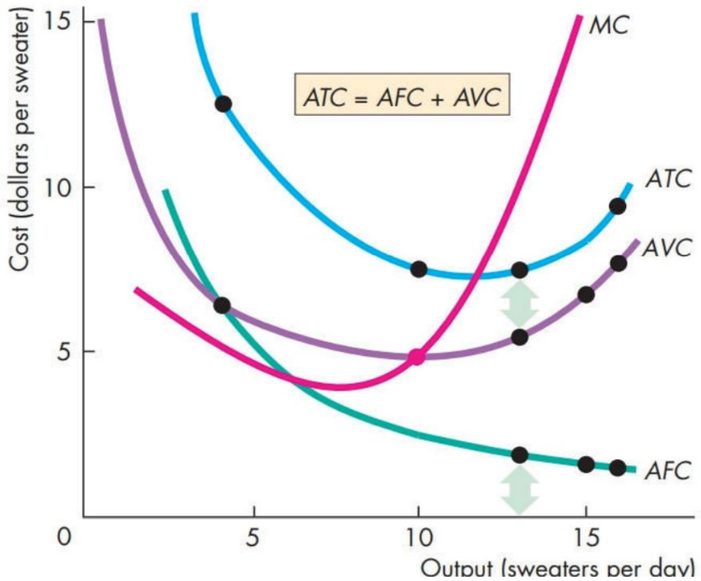
6. Output & Costs - TC, TFC, TVC Curves

Total Fixed Cost (TFC)	Total Variable Cost (TVC)	Total Cost (TC)
- **TVC:** cost of fixed inputs	- **TVC:** cost of variable inputs	- TC = TFC + TVC
- horizontal, straight line - constant because fixed input is fixed	- at low output levels: TVC is flat because MC is decreasing - at high output levels: TVC is steep because MC is increasing	- a TVC curve that's shifted up by the value of TFV



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

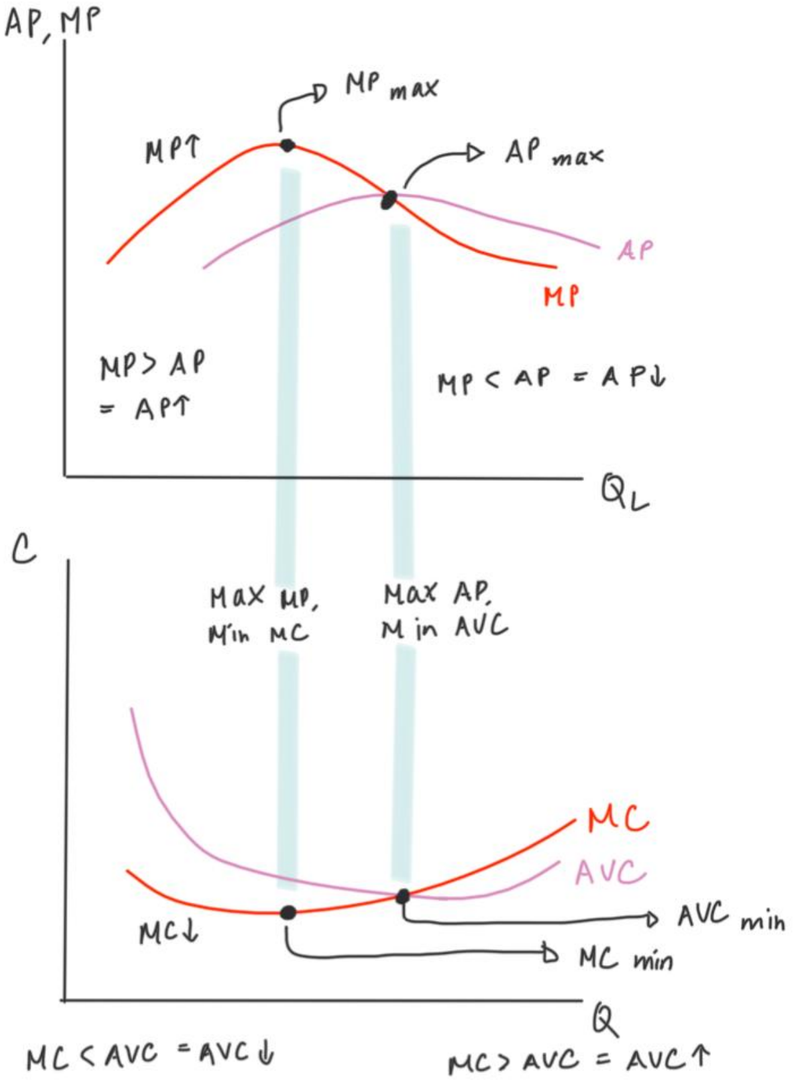
Average Total Fixed Cost (AFC)	Average Total Variable Cost (AVC)	Average Total Cost (ATC)	Marginal Cost (MC)
- **AFC** = TFC / Q	- **AVC** = TVC / Q	- **ATC** = TC / Q or AFC + AVC	- **MC:** the change in TC when TP increases by 1
- decreases as output increases	- U-shaped	- U-shaped - distance between ATC & AVC is AFC (shortens because ATC is decreasing)	- decreases until a certain point before it begins increasing



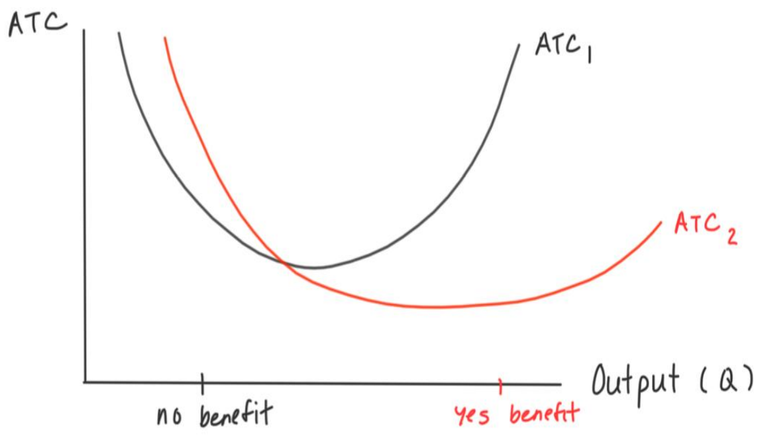
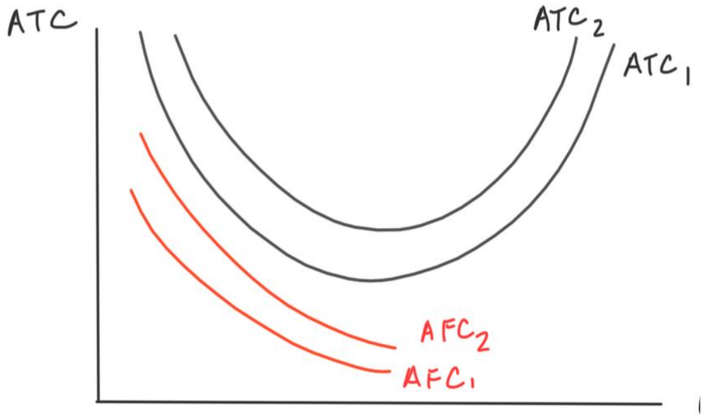
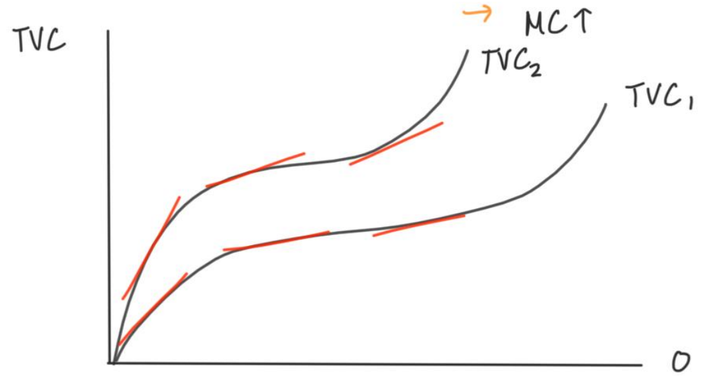
- MC is below AVC/ATC ⟶ AVC/ATC is decreasing
- MC is above AVC/ATC ⟶ AVC/ATC is increasing
- MC = AVC/ATC ⟶ AVC/ATC is at minimum

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

- MP is at max ⟶ MC is at min
- AP is at max ⟶ AVC is at min



6. Output & Costs - Shifts in Cost Curves

Technological Advancement	Price of Fixed Factors	Price of Variable Factors
- capital cost rises ⟶ AFC rises but AVC drops - at low output levels: ATC is <u>high</u> - at high output levels: ATC is <u>low</u>	- price of fixed factors rises ⟶ TFC rises ⟶ AFC rises ⟶ ATC rises	- price of variable factors rises ⟶ TVC rises ⟶ AVC rises ⟶ ATC rises - steeper tangents means higher MC
		

6. Output & Cost

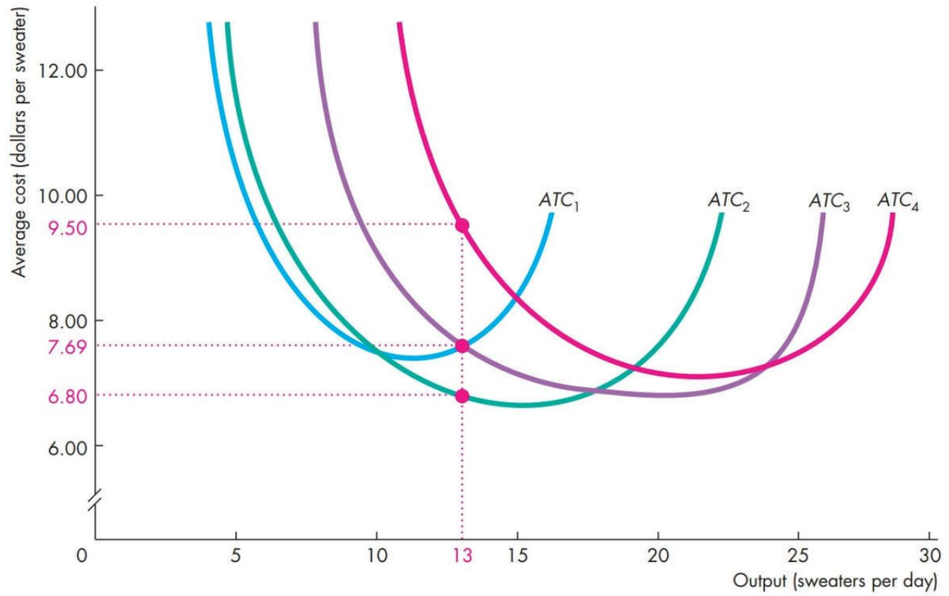
Short Run (SR)	Long Run (LR)
- **short run (SR):** time frame where the quantities of 1 or more resources used in production is fixed - eg. plant is fixed in SR, but other resources (labour, raw material) can change - decisions are <u>reversible</u> - can only increase output by increasing <u>labour</u>	- **long run (LR)**: time frame where the quantities of all resources used in production can vary - decisions are <u>irreversible</u> - can increase output by increasing <u>labour</u> &/or <u>plant</u> - **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

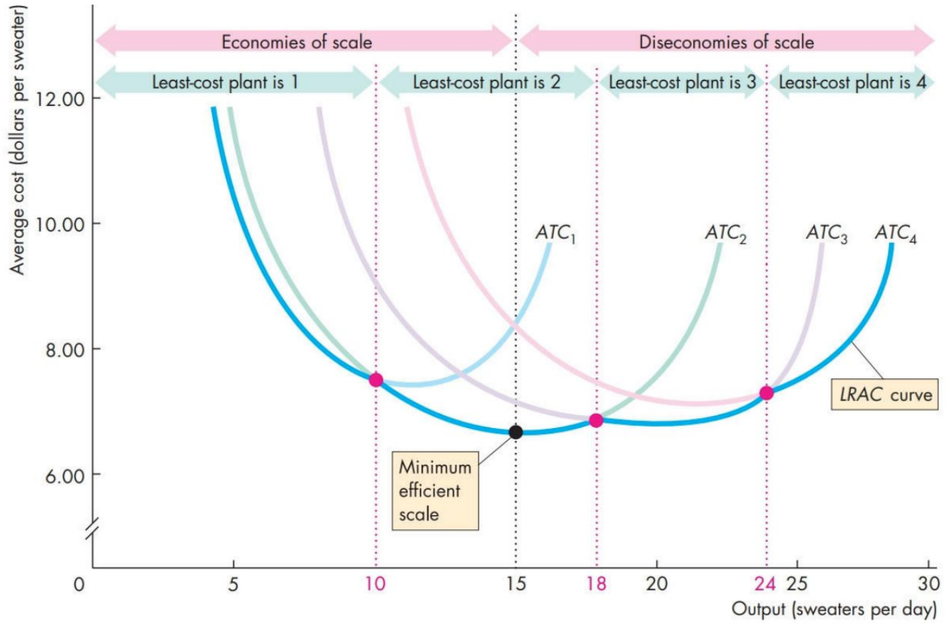
Labor (workers per day)	Output (sweaters per day)			
	Plant 1	Plant 2	Plant 3	Plant 4
1	4	10	13	15
2	10	15	18	20
3	13	18	22	24
4	15	20	24	26
5	16	21	25	27
Knitting machines	1	2	3	4

Labor (workers per day)	Output (sweaters per day)			
	Plant 1	Plant 2	Plant 3	Plant 4
1	4	10	13	15
2	10	15	18	20
3	13	18	22	24
4	15	20	24	26
5	16	21	25	27
Knitting machines	1	2	3	4

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

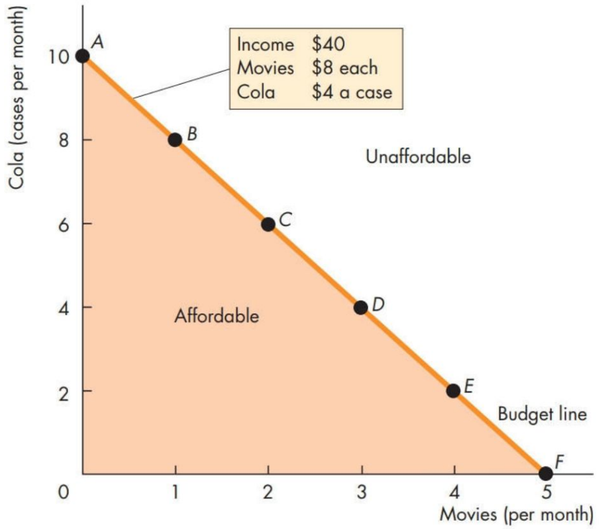




7. Utility & Demand - Consumption Possibilities

- **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

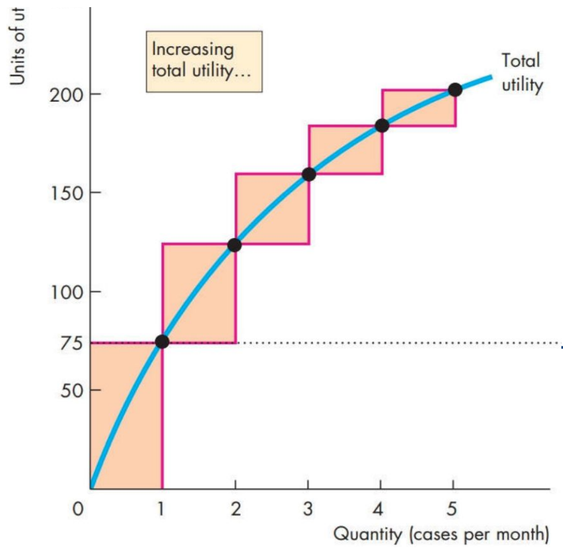
	Movies		Cola	
Possibility	Quantity	Expenditure (dollars)	Cases	Expenditure (dollars)
A	0	0	10	40
B	1	8	8	32
C	**2**	**16**	**6**	**24**
D	3	24	4	16
E	4	32	2	8
F	5	40	0	0

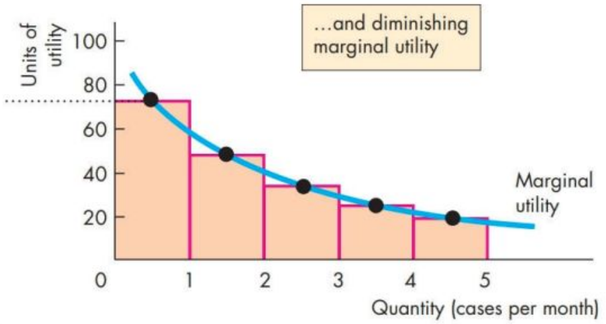


7. Utility & Demand - Utility

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

Total Utility (TU)	Marginal Utility (MU)
- increases by less as consumption increases - 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!)	- **MU:** how TU changes when 1 more unit of a good is consumed - **diminishing marginal utility**: MU decreases as consumption increases





7. Utility & Demand - Utility Maximizing Choice

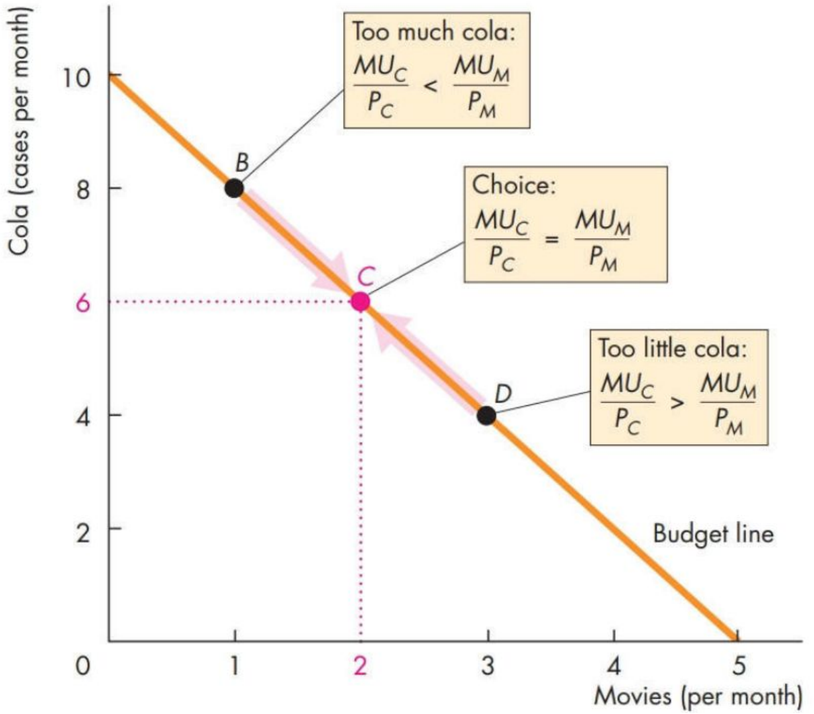
Find it <u>Manually</u>

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 <u>Marginal Utility Per Dollar</u>

- **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
  - $\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$

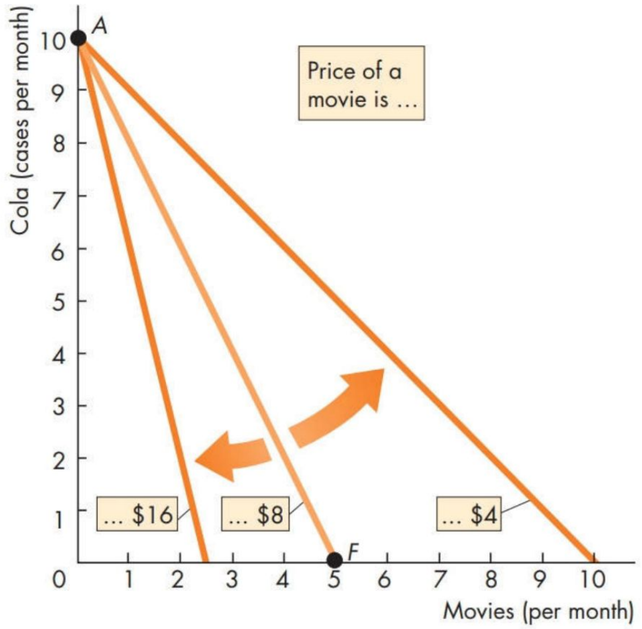
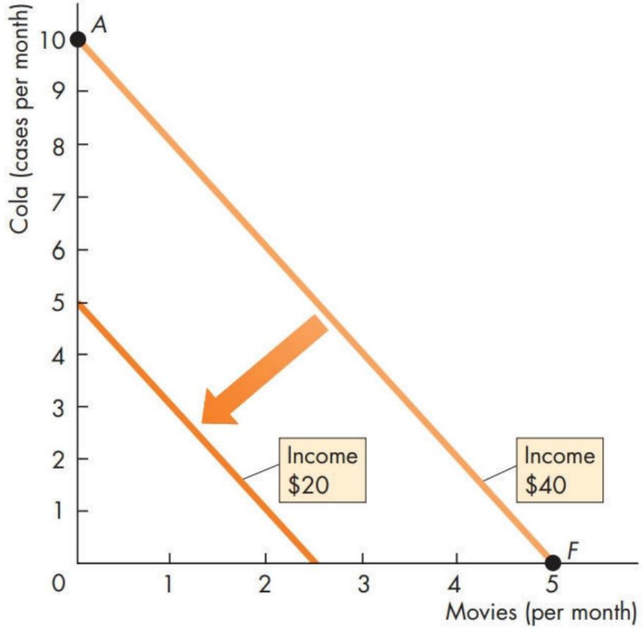


9. Utility & Demand - Real Income, Relative Price

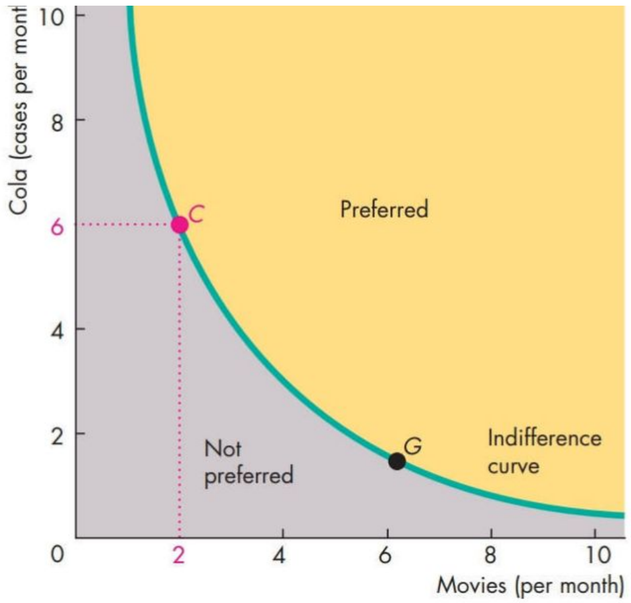
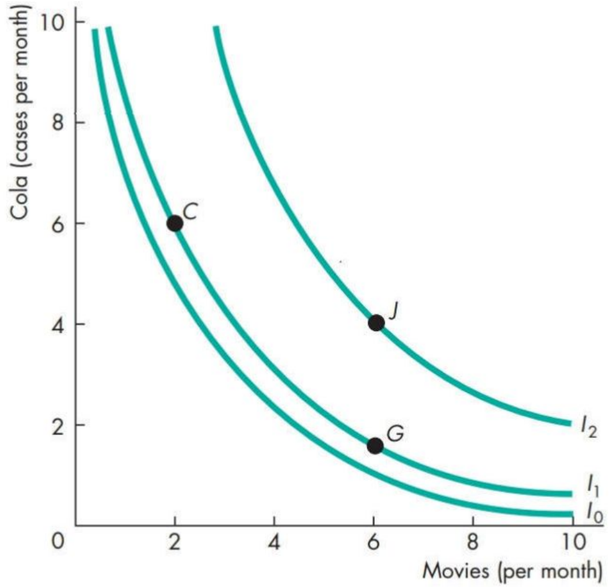
- **real income**: income expressed as a quantity of goods that the household can afford to buy
  - real income = Y/P of a good
  - eg. if income is $50 and a granola bar is $2, the real income in terms of granola bars is 25 granola bars

- **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

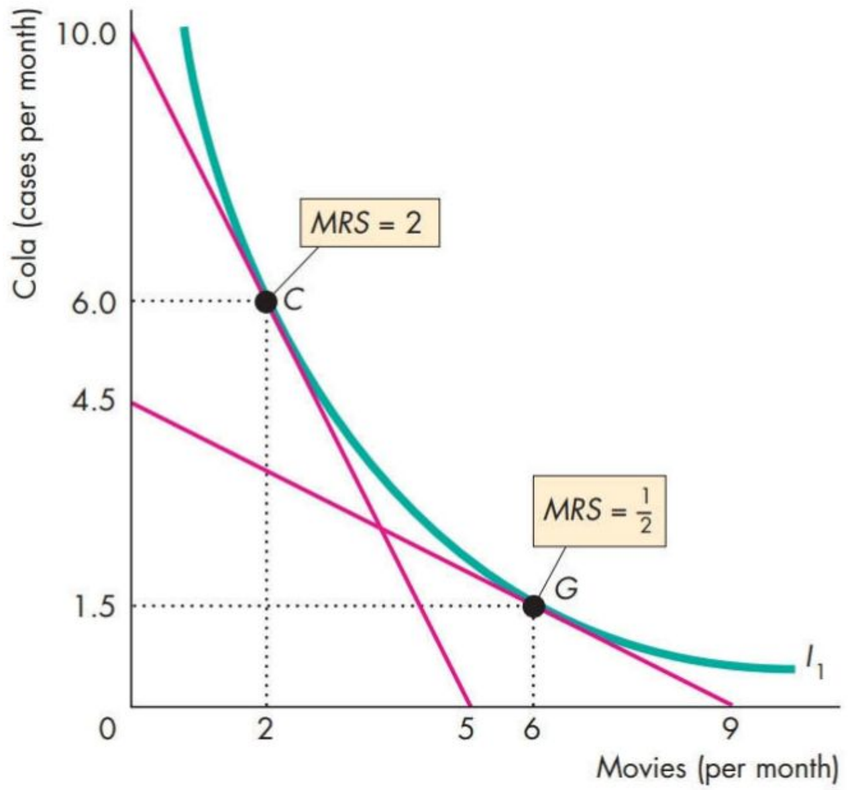
Changes in Prices	Changes in Income
- Price changes ⟶ relative price changes ⟶ slope changes - Price of the good on the x-axis drops ⟶ budget line flattens - Price of the good on the x-axis rises ⟶ budget line gets steeper	- Income changes ⟶ real income changes ⟶ budget line shifts - income increases ⟶ budget line shifts right - income decreases ⟶ budget line shifts left
	

9. Utility & Demand - Preferences Map and Indifference Curves

Indifference Curve	Preference Map
- **Indifference curve:** shows the combos of goods where the consumer is indifferent - order of preference: below indifference curve < indifference curve < above indifference curve	- **Preference map:** shows multiple indifference curves - farther the budget line is from the origin, the more the consumer prefers it
	

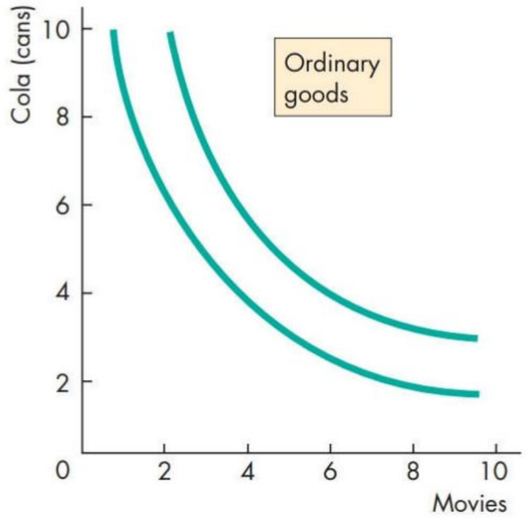
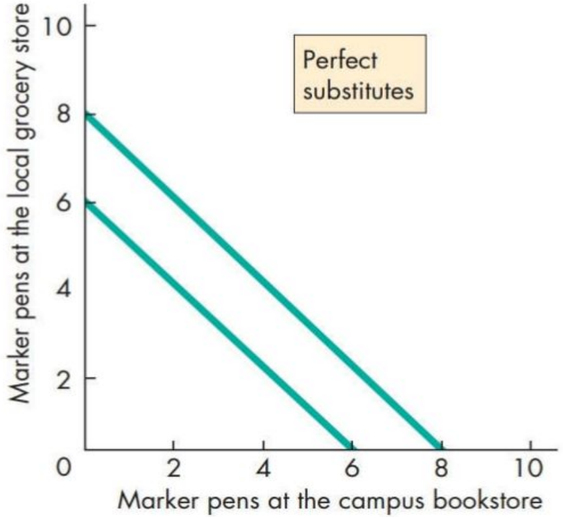
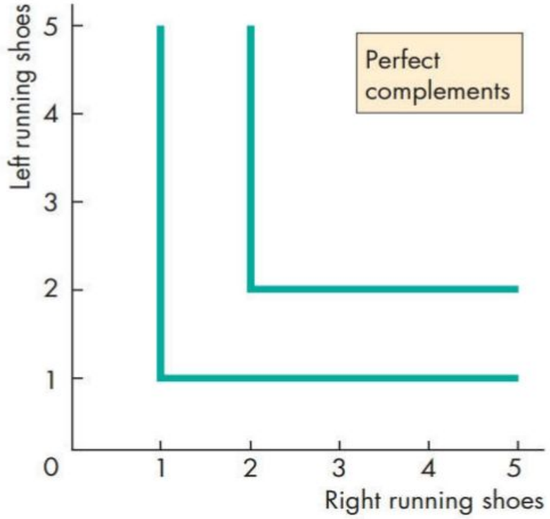
9. Utility & Demand - Marginal Rate of Substitution

- **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



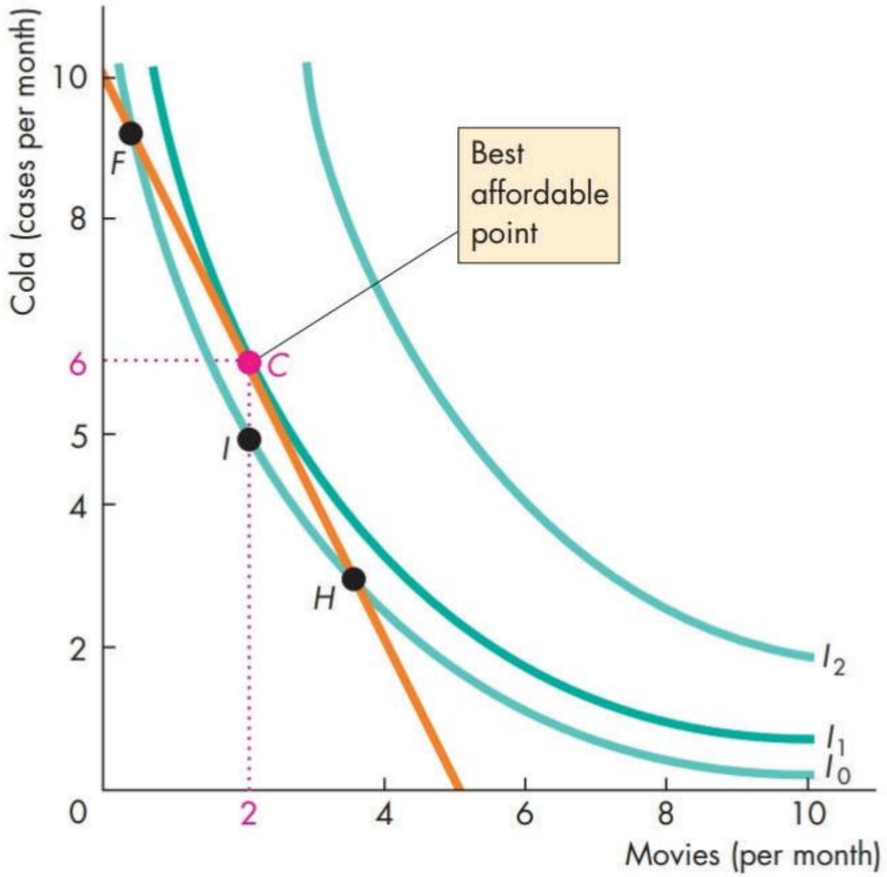
9. Utility & Demand - Degree of Substitutability

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

Ordinary Goods	Perfect Substitutes	Complements
- **Ordinary goods:** can substitute each other to a certain degree - eg. movie and coke	- **Perfect substitutes**: can very easily substitute for one other - eg. pens from Superstore and pens from Walmart	- **Complements:** can't replace each other at all - eg. left and right sneakers
		

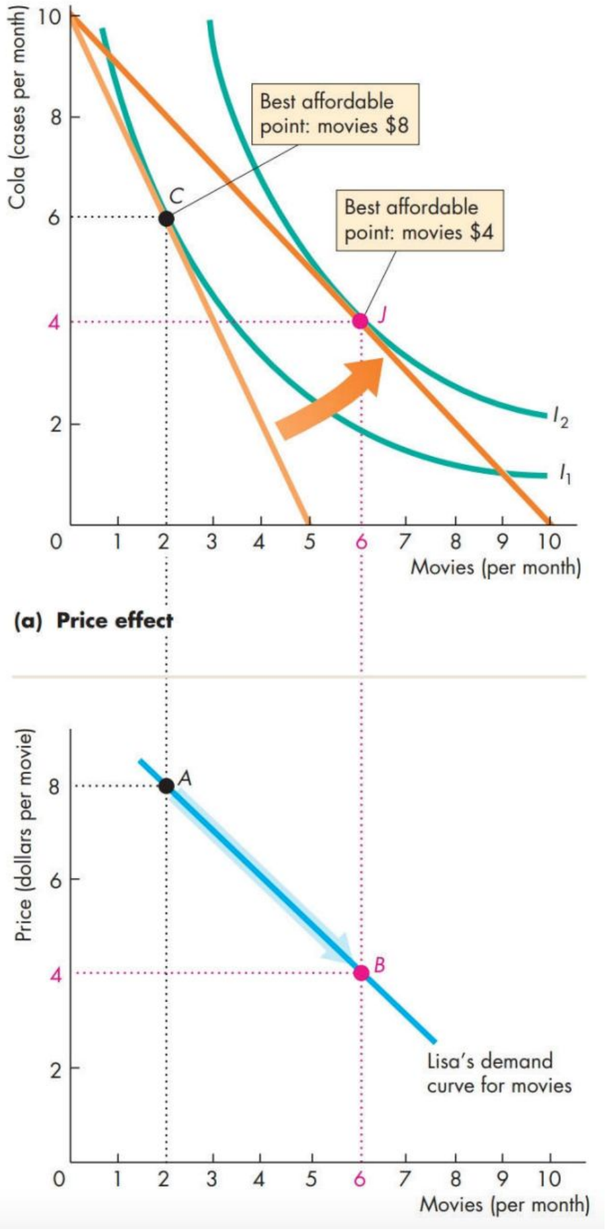
9. Utility & Demand - Best Affordable Choice

- **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



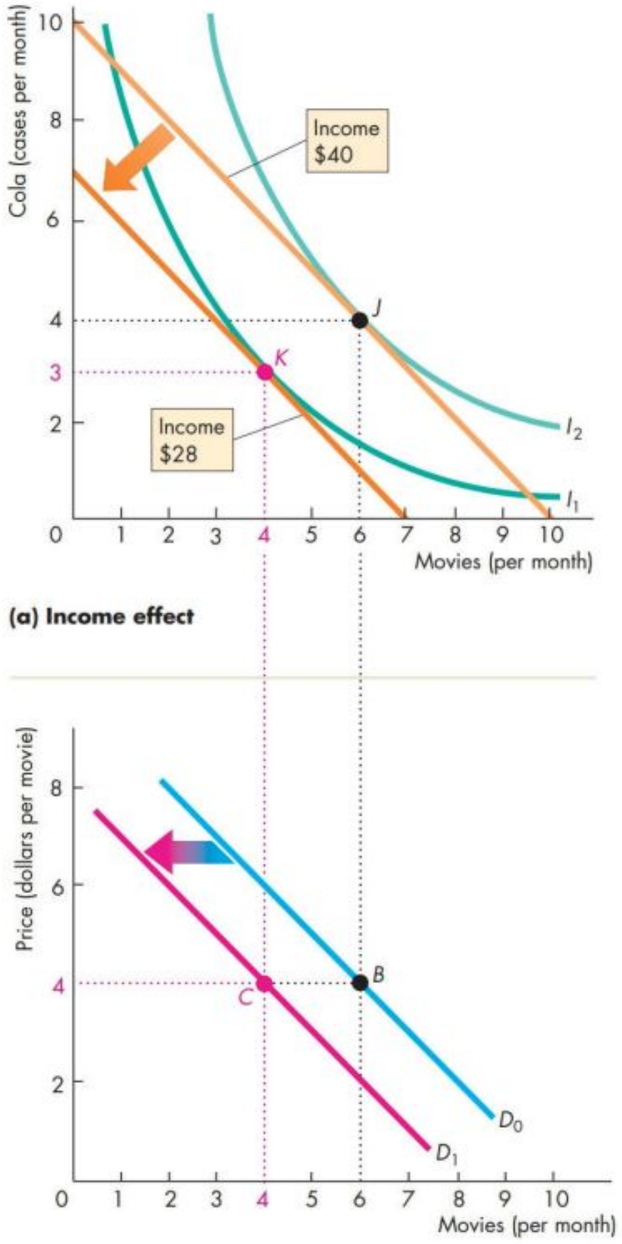
9. Utility & Demand - Price Effect

- **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*



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*



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

Price ceiling < P*

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

Production subsidies increase Q while all of the other ones decrease Q

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

If a good/service is perfectly inelastic, consumers would still demand Q regardless of the price

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
a) False

TU is only maximized when all of the person’s income is spent

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

TABLE OF CONTENTS

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- Monopoly

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

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

Newest to oldest

7. What is Economics

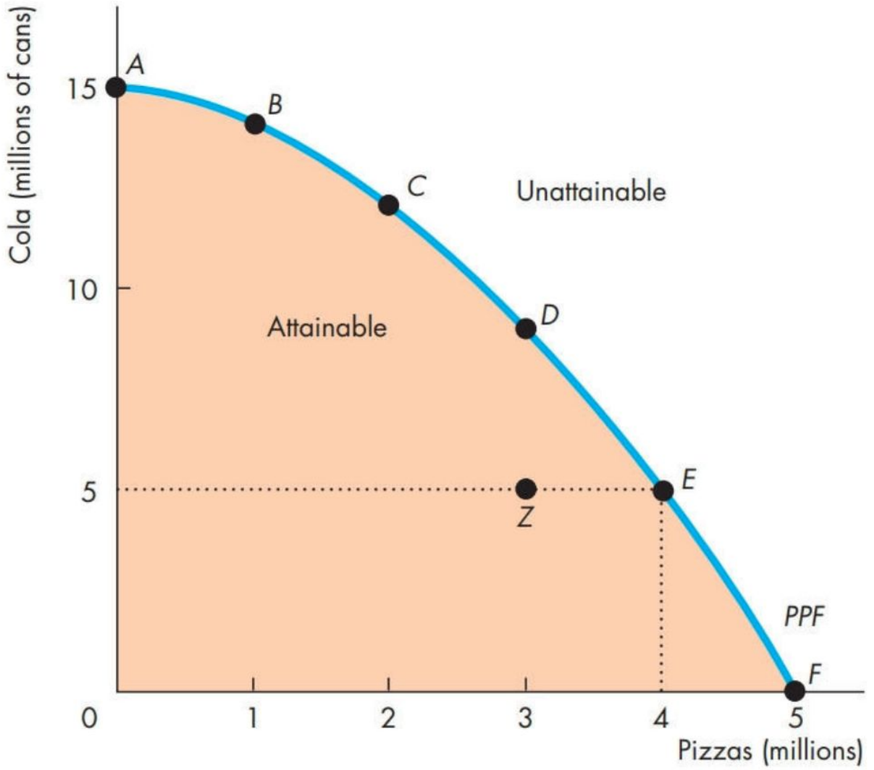
- **Economics**: social science that studies the choices individual people, businesses, government, and societies make to cope with scarcity
    - based on **scarcity**: our inability to get everything we want due to limited resources
    - leads to **trade-offs:** must give up 1 thing if you want another
- **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

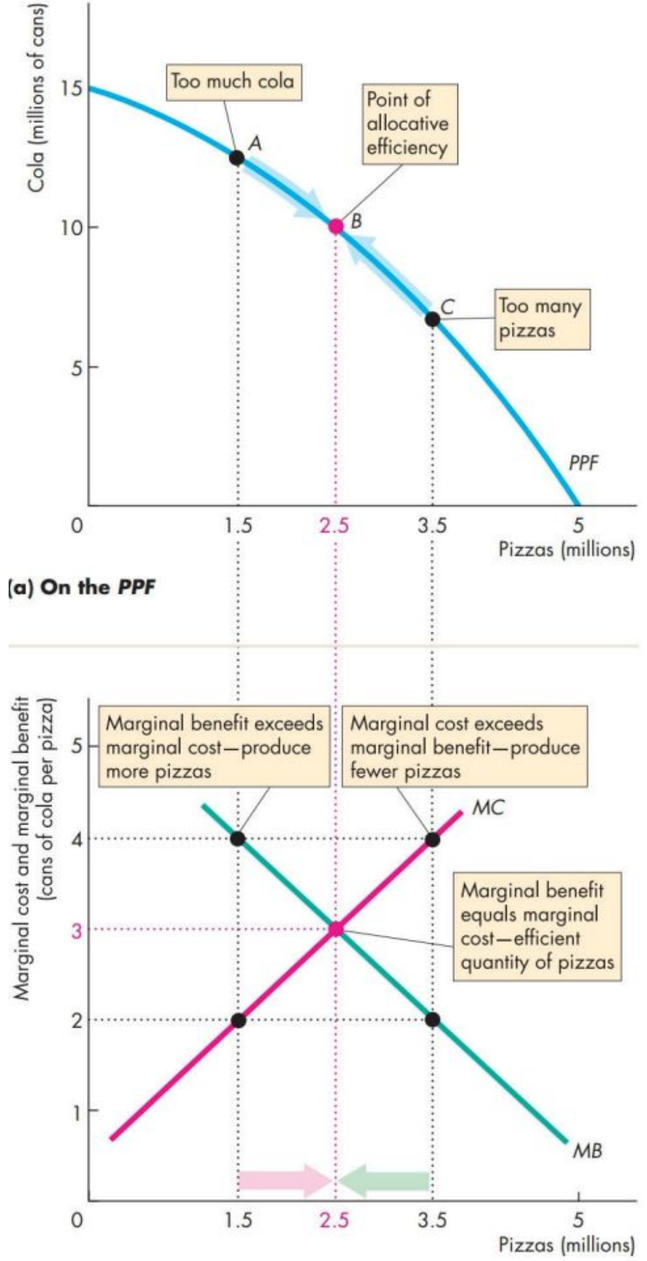
- **Opportunity cost (OC)**: next BEST alternative given up in order to get something else
  - OC of good A = # of good B



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 more of 1 good without giving up another good that gives more benefit
  - MC = MB → producing the most efficient combination of the 2 goods, at **equilibrium (EQM)**



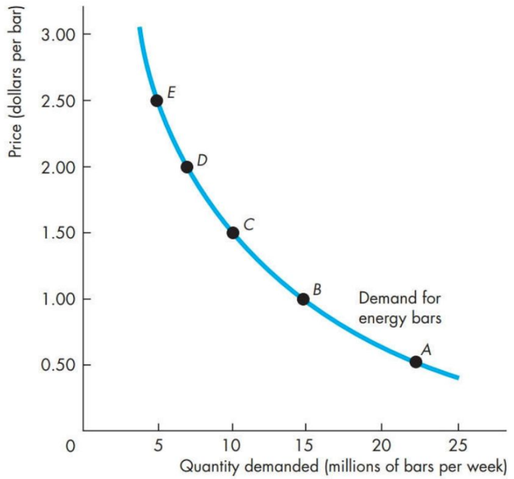
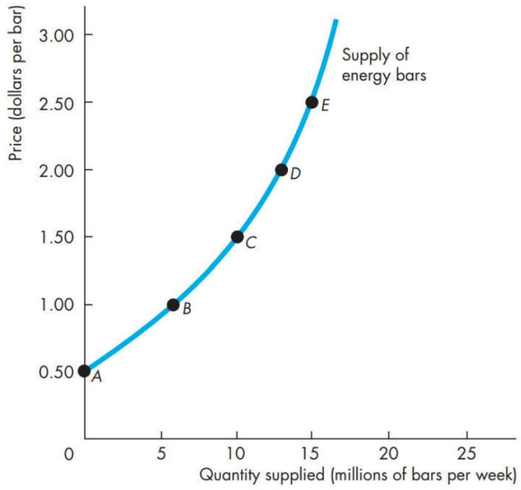
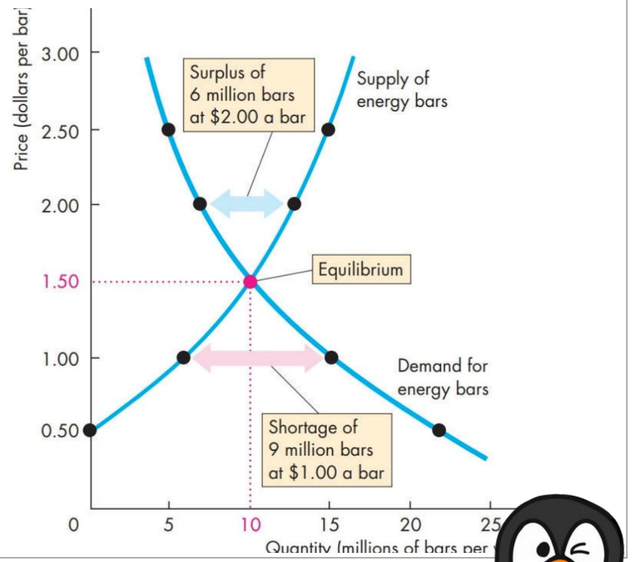
8. Gains From Trade

- **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 ≤ P_{good} ≤ Buyer's OC

<u>Steps to Approaching Gains from Trade Problems:</u>

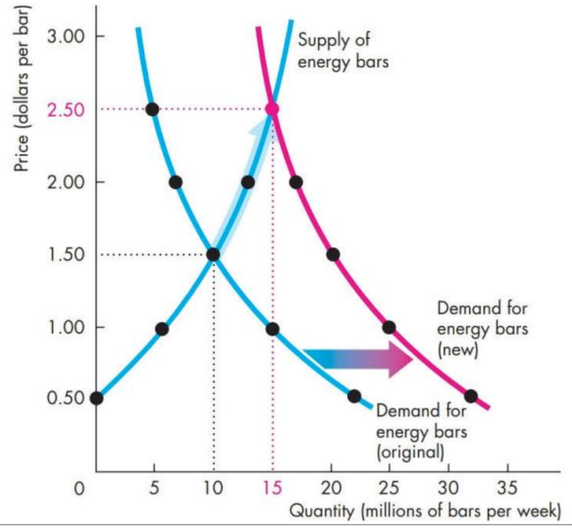
1. Calculate the OCs
2. Determine who has a lower OC for each good ⟶ they will specialize in what they have a comparative advantage in
3. Determine the trading price: Seller's OC ≤ P_{good} ≤ Buyer's OC
4. Gains from trade = # of $goods_{before\ trade}$ – # of $goods_{after\ trade}$

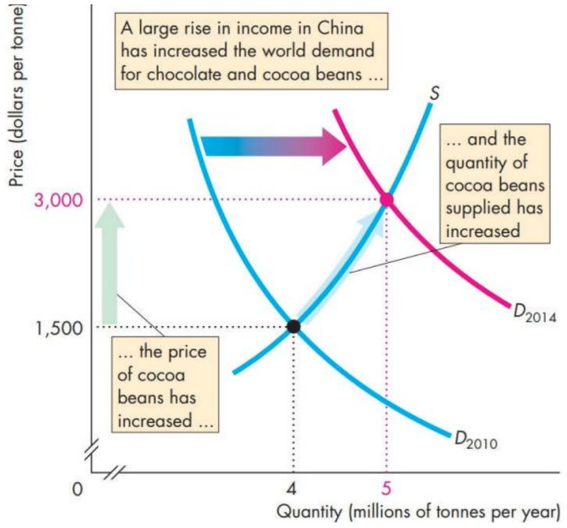
8. Demand, Supply, EQM

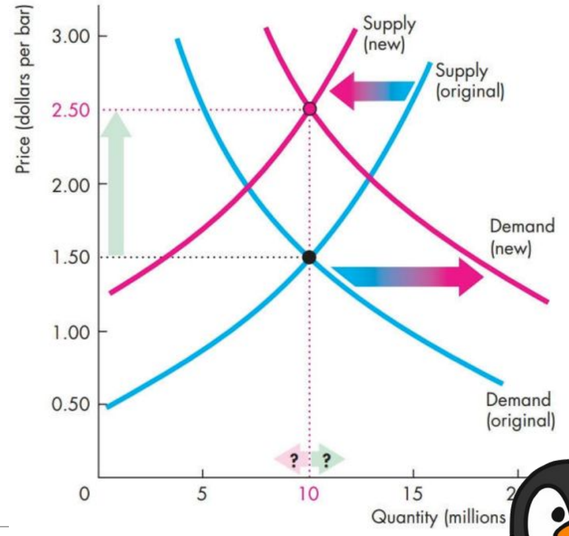
Demand (D)	Supply (S)	Equilibrium (EQM)
- **Demand:** when a person wants, can afford, and plan on buying something - **Quantity demanded (Qd):** how much a person plans to buy at a specific price - **Law of Demand:** if price increases, Qd decreases	- **Supply:** when a firm have the ability to produce, 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	- **market equilibrium:** when D = S
FIGURE 3.1 The Demand Curve 	**FIGURE 3.4** The Supply Curve 	

8. Demand, Supply, EQM - Shifts

Demand (D)	Supply (S)	Equilibrium (EQM)
- P related goods (complementary goods, substitute goods) - P expected future - Income - Future income - Population - Preference	- P factors of production - P related goods produced - P expected future - Number of suppliers - Technology - State of Nature	- EQM would change if Demand and/or Supply curve changes



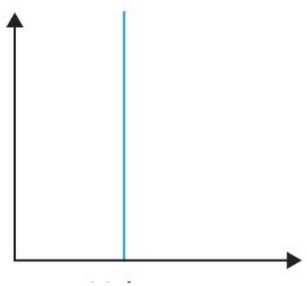
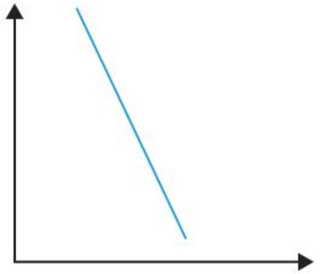
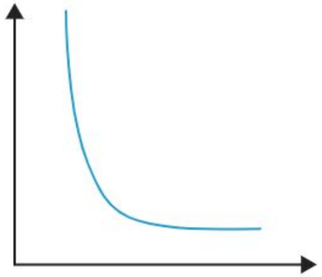
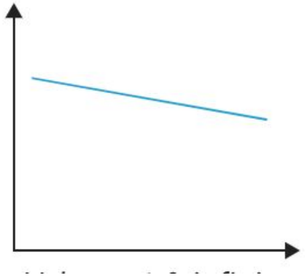
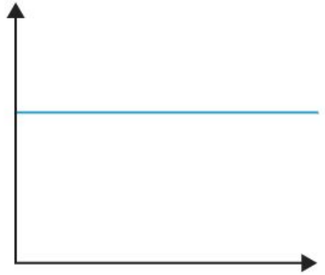




9. Elasticity - ed, es

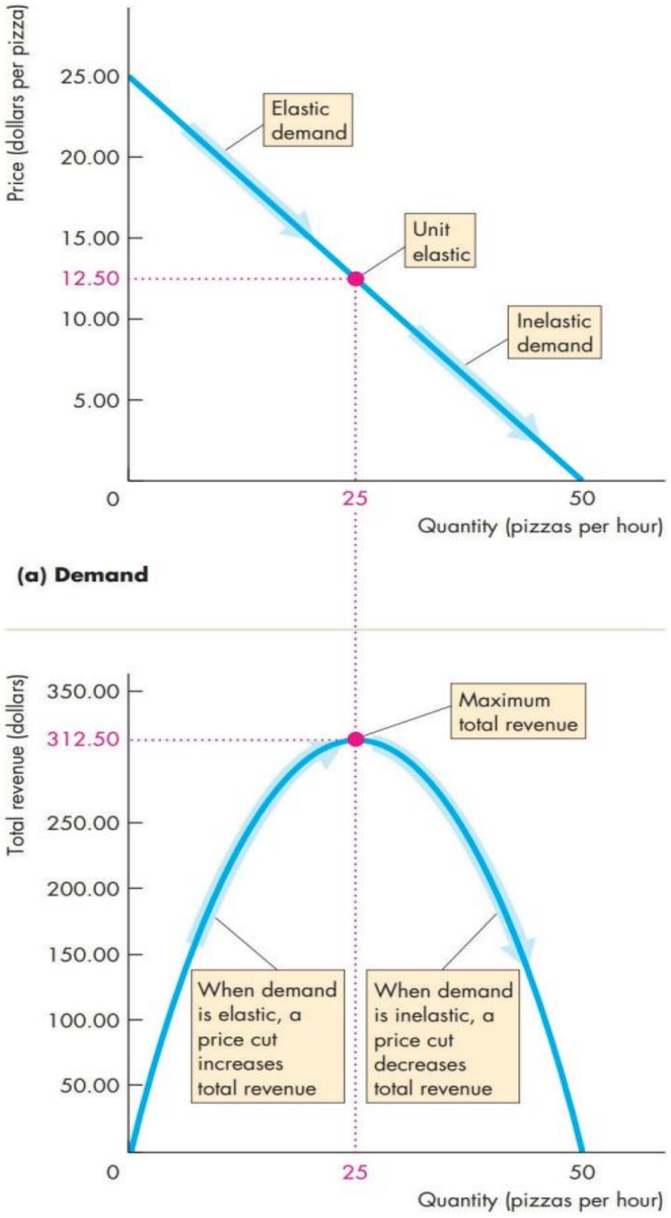
	Price elasticity of demand	Price elasticity of supply
Definition	- how responsive Qd is to a change in P	- how responsive Qs is to a change in P
Formula	- ed = $\frac{\% \Delta Qd}{\% \Delta P} = \frac{(\Delta Qd / Qd\ avg)}{(\Delta P / P\ avg)}$	- es = $\frac{\% \Delta Qs}{\% \Delta P} = \frac{(\Delta Qs / Qs\ avg)}{(\Delta P / P\ avg)}$
Factors that Influence it	- closeness of substitutes - proportion of income spent on good - time elapsed since price change	- 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 = |∞|
graph					
examples	- insulin	- food - shelter		- cars - furnitures	- 2 soft drinks side-by-side in a vending machine

9. Elasticity - Total Revenue (TR)

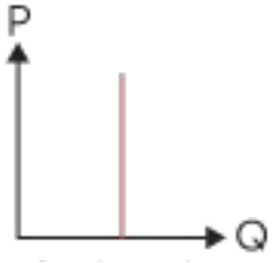
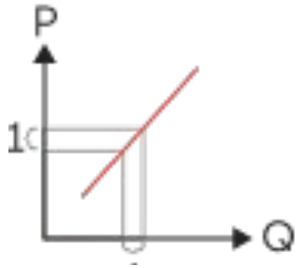
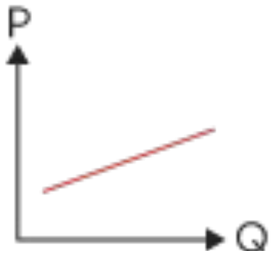
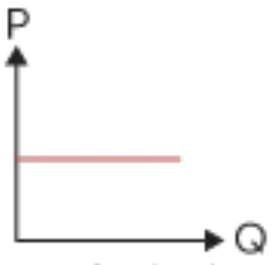
- ed = elastic
  - upper half of a linear demand curve
  - decrease price to maximize TR
- ed = inelastic
  - lower half of a linear demand curve
  - increase price to maximize TR
- ed = unit elastic
  - midpoint of a linear demand curve
  - maximizes TR



9. Elasticity - More Elasticity

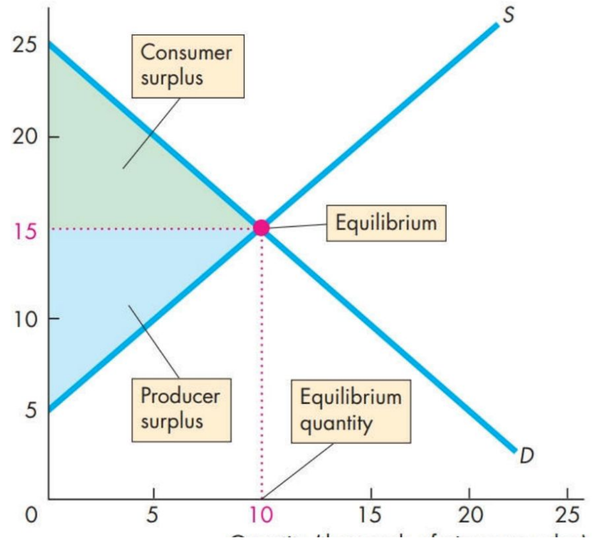
	Cross Elasticity (ec)	Income Elasticity (ei)
Definition	- **cross elasticity:** how responsive demand for a good is when $P_{\text{substitute or complement}}$ changes	- **income elasticity:** how responsive demand for a good is when income changes
Formula	- $ec = \frac{\%\ \Delta\ Qd}{\%\ \Delta\ Psub/complement}$	- $ei = \frac{\%\ \Delta\ Qd}{\%\ \Delta\ income}$
Range	- $ec < 0 \rightarrow$ **complement good**: used with the good - $ec > 0 \rightarrow$ **substitute good:** can replace the good	- $ei \geq 1 \rightarrow$ income elastic, **normal good**: demand for it rises when income rises - $0 < ei < 1 \rightarrow$ income inelastic, normal good - $ei < 0 \rightarrow$ depends, **inferior good:** demand for it drops when income rises

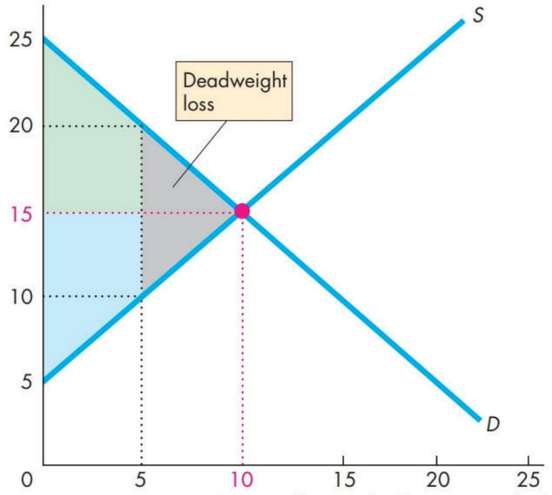
9. Elasticity - 5 Types of Es

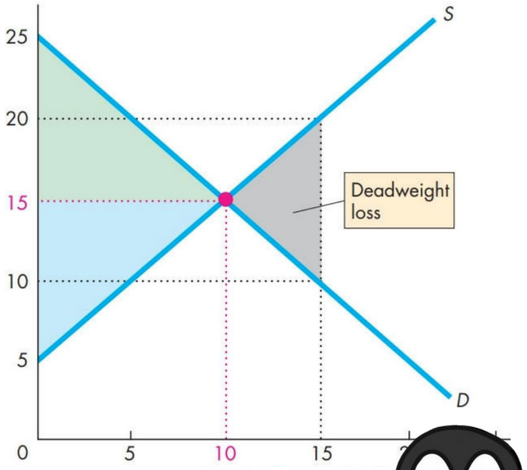
	perfectly inelastic	inelastic	unit elastic	elastic	perfectly elastic
Definition	Qs stays the same regardless of P	Qs reacts little to P changes	when a linear supply curve passes through the origin	Qs reacts alot to P changes	when the supplier is willing to sell any quantity at a specific P
es range	es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

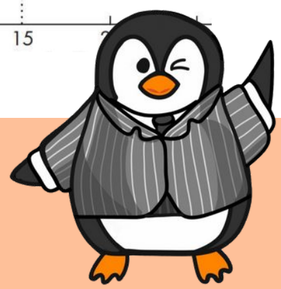
10. Surplus & Efficiency

- **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

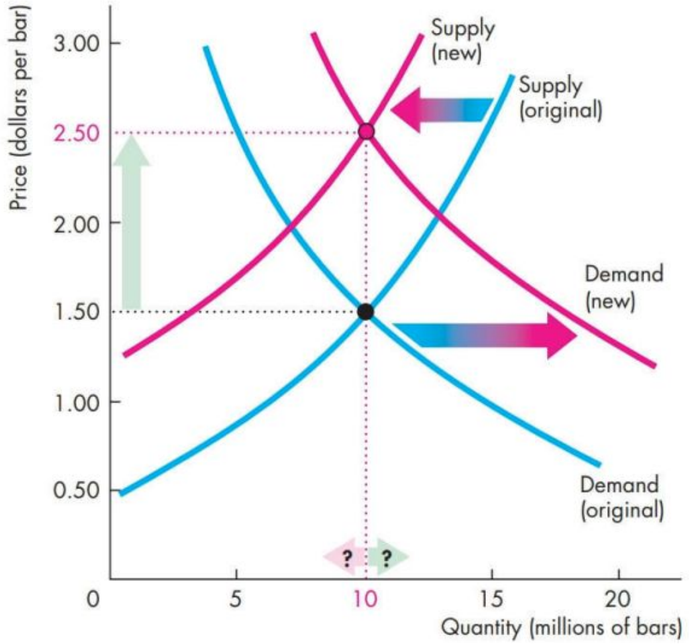
- **market failure:** when a market is inefficient either due to underproduction or overproduction

Underproduction	Overproduction
1. price & quantity regulations 2. taxes 3. positive externalities 4. **public good:** benefits everyone, no one can be excluded from them - eg. national defense - underproduce because everyone depends on others to pay for it (freeride) 5. monopoly 6. high translation costs	1. subsidy 2. negative externalities 3. **common resource:** owned by no one, but everyone can use it - 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

Because our wants are unlimited, we would always more than we have

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

TR is maximized at the midpoint of the demand curve. That is, where P is half of the y-intercept

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

If iPad prices decreased, demand for it would increase, so demand for its complement would increase too

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

Shopping is the next BEST alternative to partying, so it's the OC of 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

If Wanda values pizza more, the consumer surplus (difference between what she's willing to pay and what she actually pays) would be greater than Wilson's.

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!

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