

CMP

COMMERCE MENTORSHIP PROGRAM

MIDTERM REVIEW SESSION

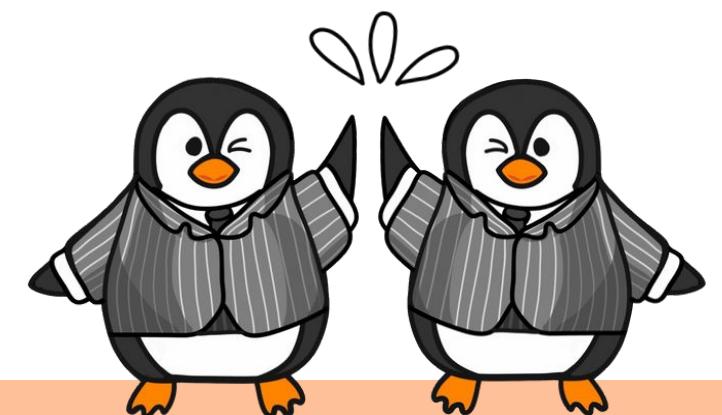
ECON 101

Prepared by: Jessalyn Sin

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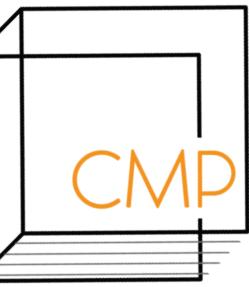
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commerce
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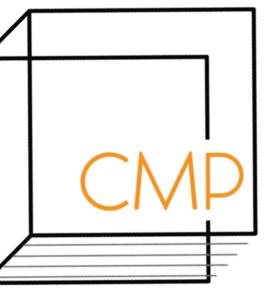


1. What is Economics
2. PPF, Gains from Trade
3. Demand & Supply
4. Elasticity
5. Surplus & Efficiency
6. Global Market in Action
7. **Government Actions in Market**
8. Output & Costs
9. Utility & Demand



May or may not pertain to your midterm depending on who's your professor

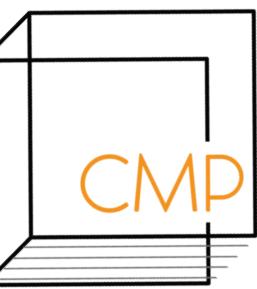




1. What is Economics

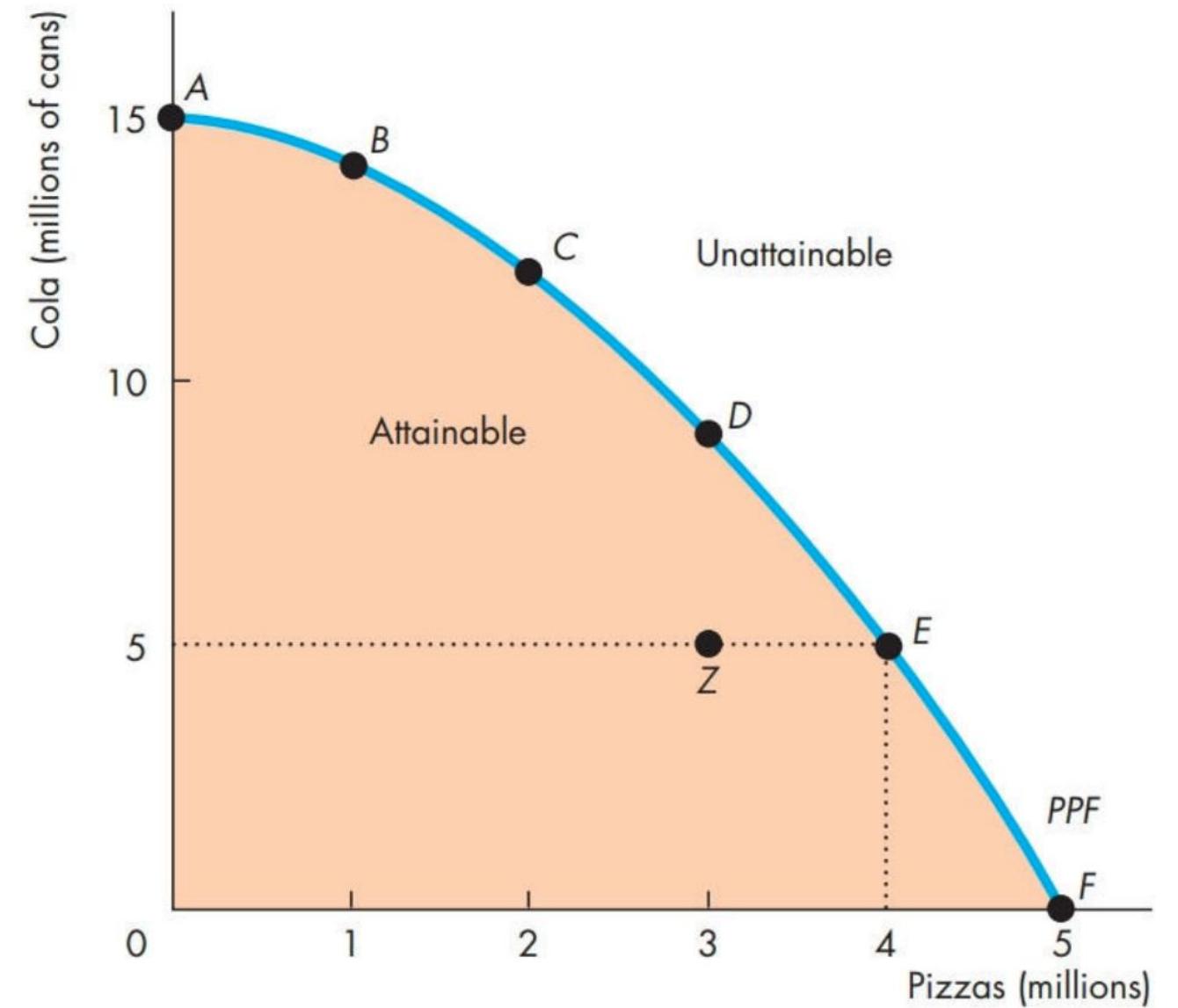
- **Economics:** social science that studies the choices individual people, businesses, government, and societies make to cope with scarcity
 - based on **scarcity:** our inability to get everything we want due to limited resources
 - leads to **trade-offs:** must give up 1 thing if you want another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

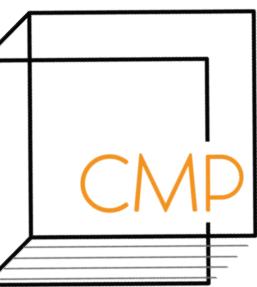




2. PPF

- **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

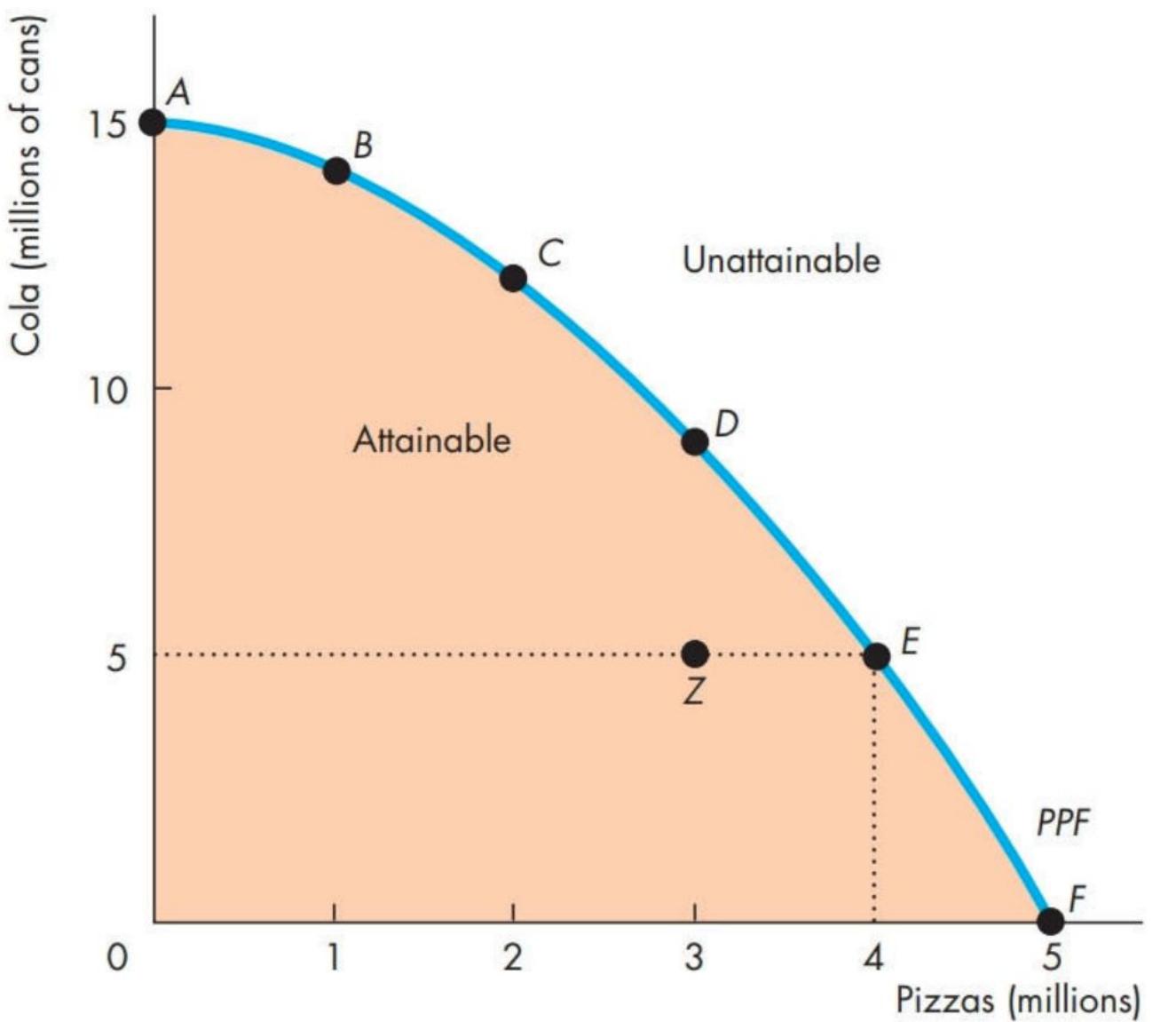


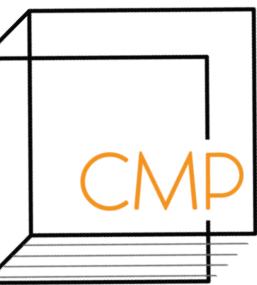


2. PPF

Q1: Explain why the PPF curves outwards (concave shape)?

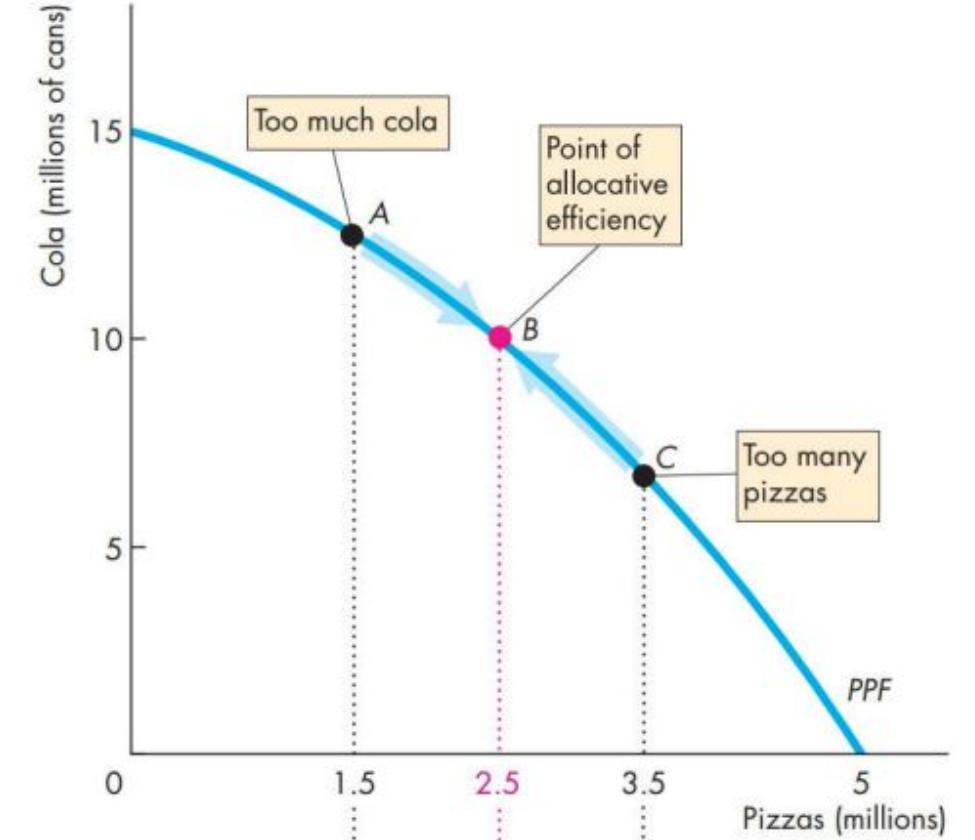
Q2: How can the PPF be pushed outwards?



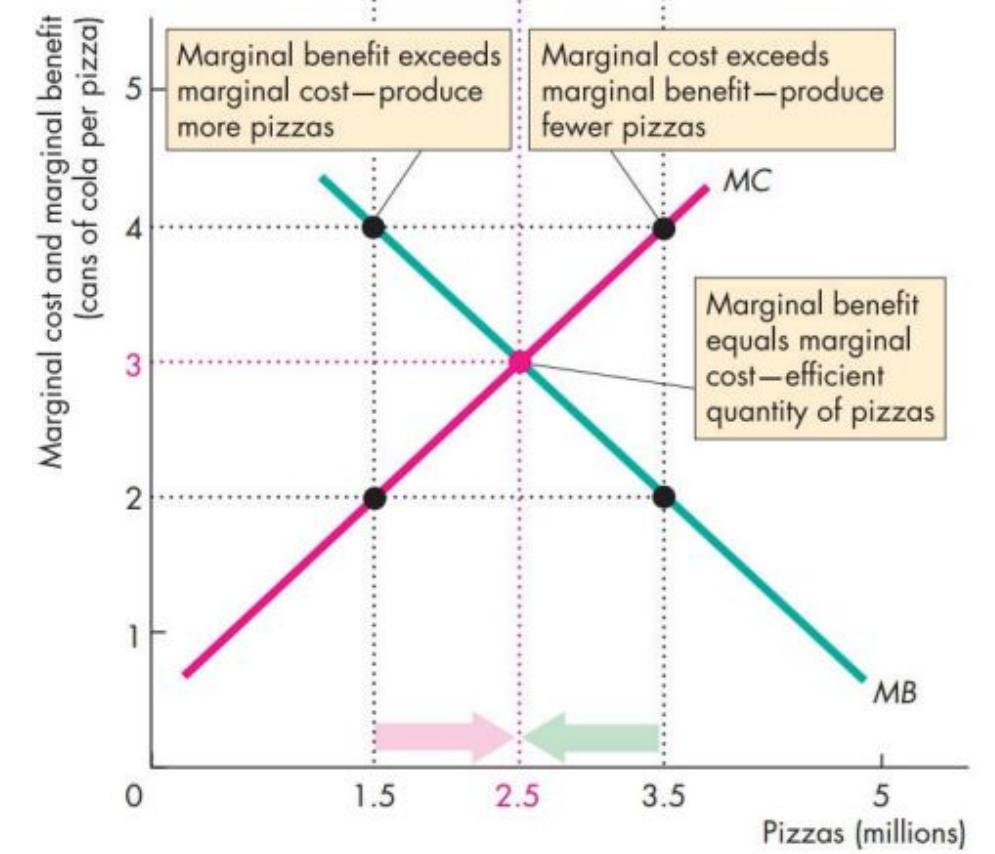


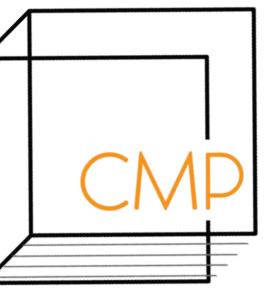
2. PPF - Using Resources Efficiently

- **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





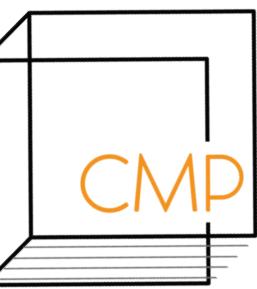
2. Gains From Trade

- **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}





2. Gains From Trade

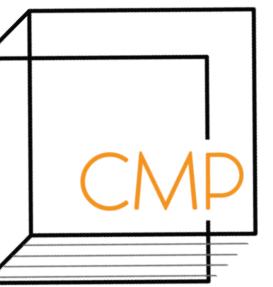
Q3: Carl and Chelsea bake muffins and cookies for 1 hour on Saturdays. Carl can either bake 5 muffins or 50 cookies in 1 hour while Chelsea can bake 20 muffins or 40 cookies.

- a. Who has an absolute advantage in muffin production? In cookie production?

- b. Who has a comparative advantage in muffin production? In cookie production?

	OC of 1 muffin	OC of 1 cookie
Carl		
Chelsea		





2. Gains From Trade

- c. Assume they decided to specialize and trade, if Chelsea offers to sell Carl 1 muffin for 15 cookies, would Carl accept the trade? If not, what price range would be acceptable to both of them?

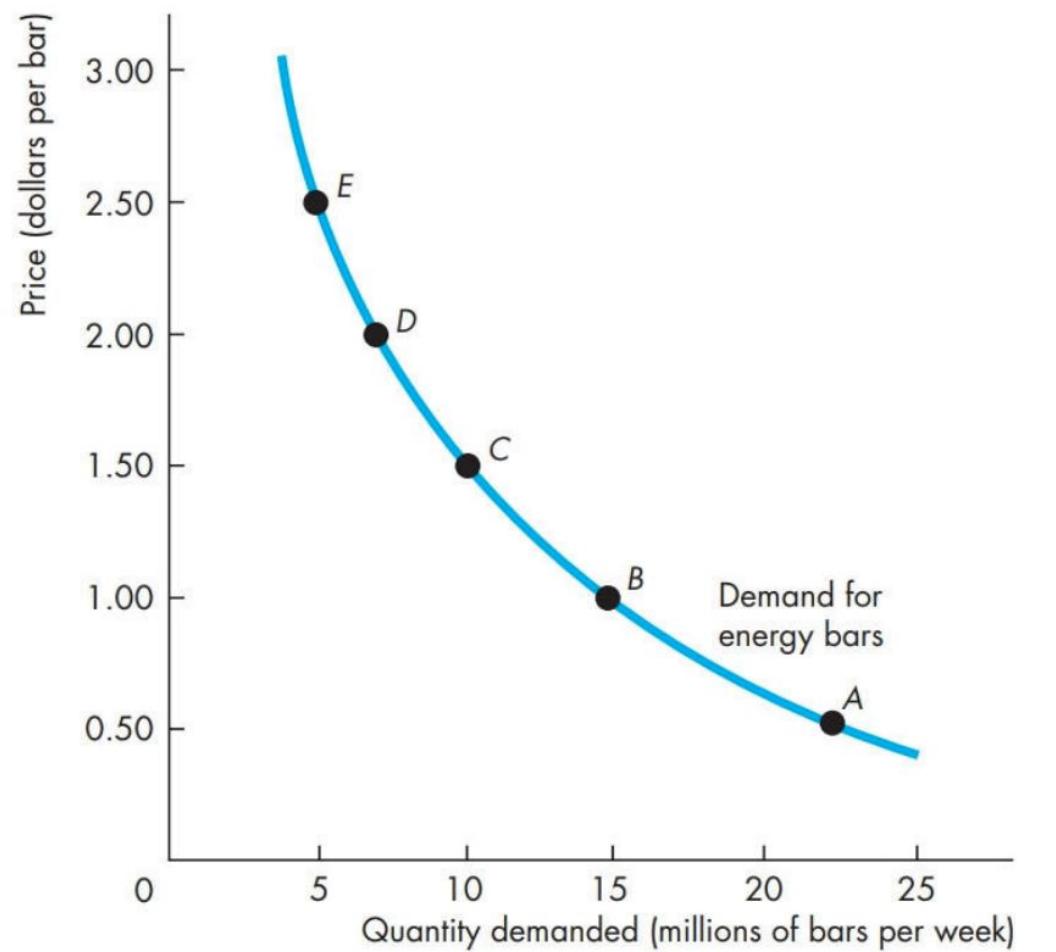
	OC of 1 muffin	OC of 1 cookie
Carl	<u>50 cookies</u> = 10 cookies 5 muffins	<u>5 muffins</u> = 0.1 muffins 50 cookies
Chelsea	<u>40 cookies</u> = 2 cookies 20 muffins	<u>20 muffins</u> = 0.5 muffins 40 cookies

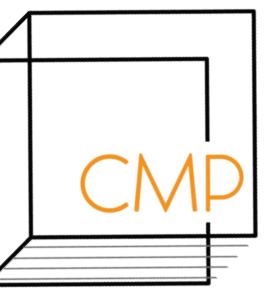


3. Demand & Supply - Demand

- **Demand:** when a person wants something, can afford it, and plan on buying it
 - **Quantity demanded (Qd):** amount a person plans to buy at a specific price
 - **Law of Demand:** if price increases, Qd decreases
- Shifts:
 1. $P_{\text{related goods}}$ (complementary goods, substitute goods)
 2. $P_{\text{expected future}}$
 3. Income
 4. Future income
 5. Population
 6. Preference

FIGURE 3.1 The Demand Curve

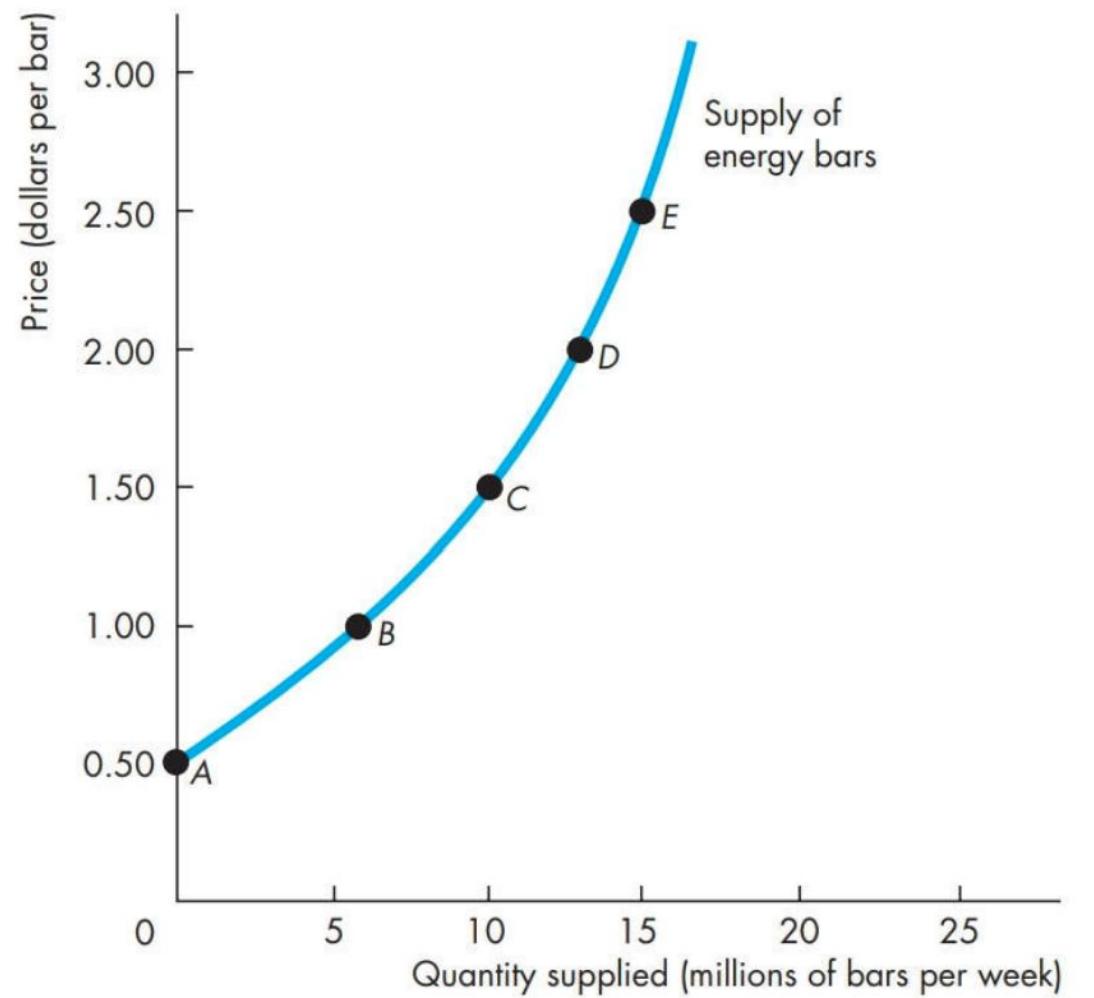


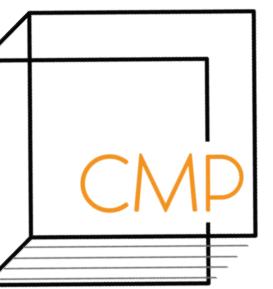


3. Demand & Supply - Supply

- **Supply:** when a firm have the technology and resources to produce, can make profit from it, and plan on producing and selling
 - **Quantity supplied (Q_s):** amount a firm would produce at a specific price
 - **Law of Supply:** if price increases, Q_s increases
- Shifts:
 1. P_{factors of production}
 2. P_{related goods produced}
 3. P_{expected future}
 4. Number of suppliers
 5. Technology
 6. State of Nature

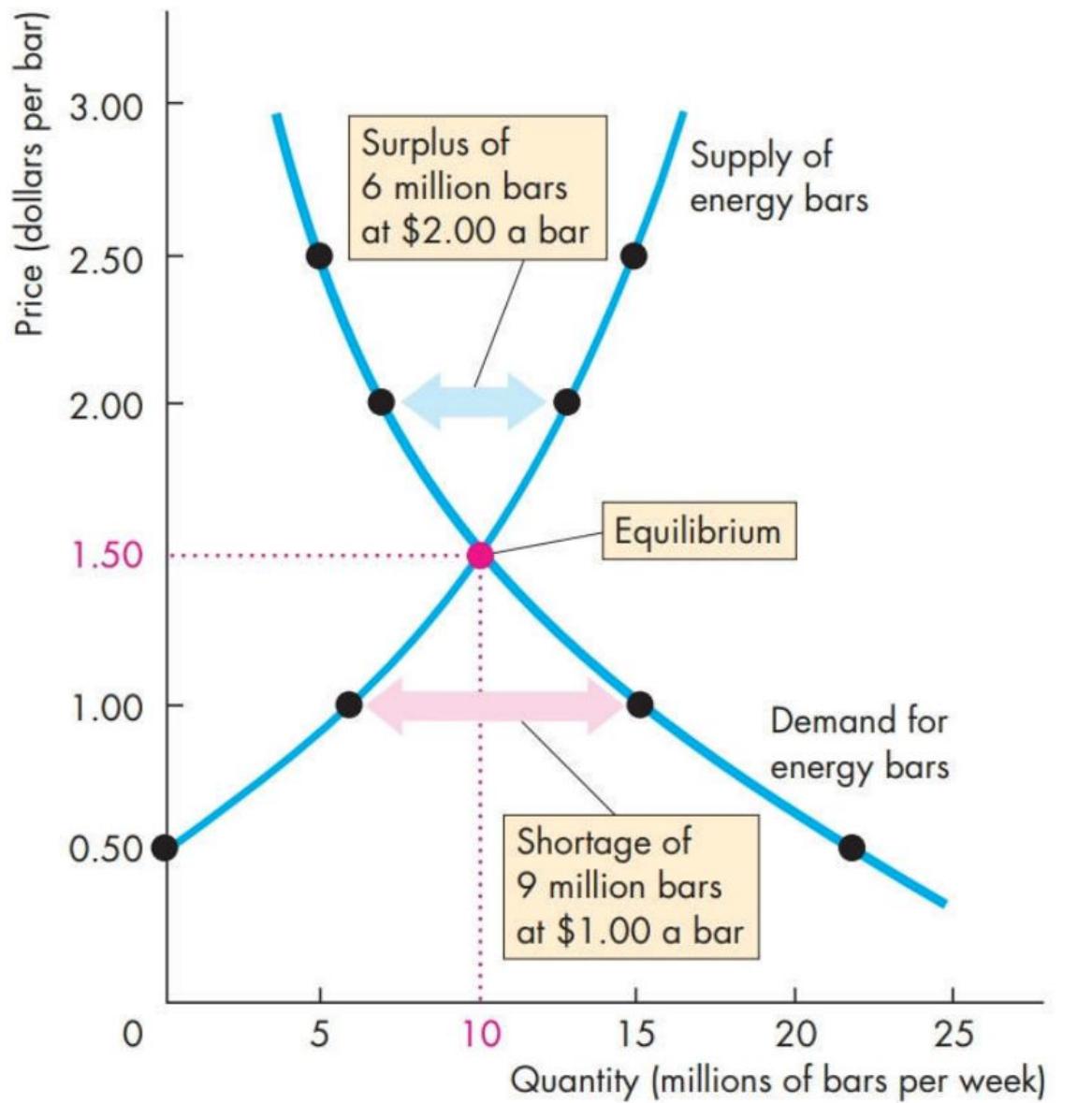
FIGURE 3.4 The Supply Curve

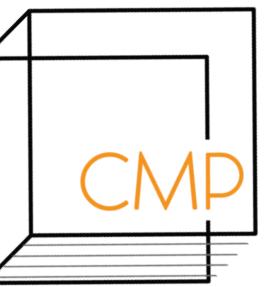




3. Demand & Supply - EQM

- **market equilibrium:** occurs when demand equals supply
- Steps to Solving EQM:
 1. Equate the demand and supply equations
 2. Solve the system of equations
 3. Pluck the solved P or Q back into either of the demand or supply functions to solve for the other unknown





3. Demand & Supply

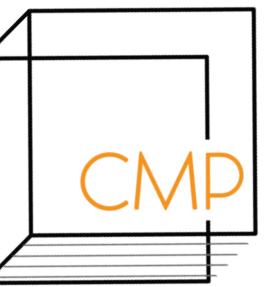
Q4: The prices for vests in CMP Land fell, as a result...

- a) the supply curve will shift right
- b) the supply curve will shift left
- c) Q_s will decrease
- d) Q_s will increase

Q5: Tea is a substitute good of coffee, and cream is a complementary good of coffee. If the price for coffee increased, the demand for tea will _____, and the demand for cream will _____.

- a) increase, decrease
- b) decrease, increase
- c) decrease, remain the same
- d) remain the same, remain the same

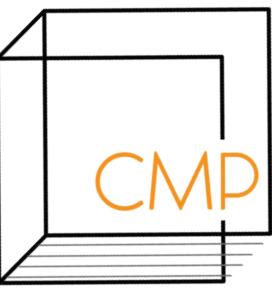




4. Elasticity - ed, es

	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	$ed = \frac{\% \Delta Q_d}{\% \Delta P} = \frac{(\Delta Q_d / Q_{d_avg})}{(\Delta P / P_{avg})}$	<ul style="list-style-type: none"> ○ $es = \frac{\% \Delta Q_s}{\% \Delta P} = \frac{(\Delta Q_s / Q_{s_avg})}{(\Delta P / P_{avg})}$
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



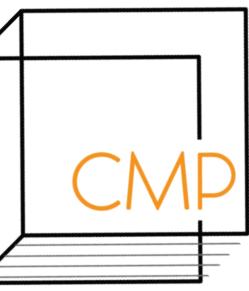


4. Elasticity - 5 Types of Ed

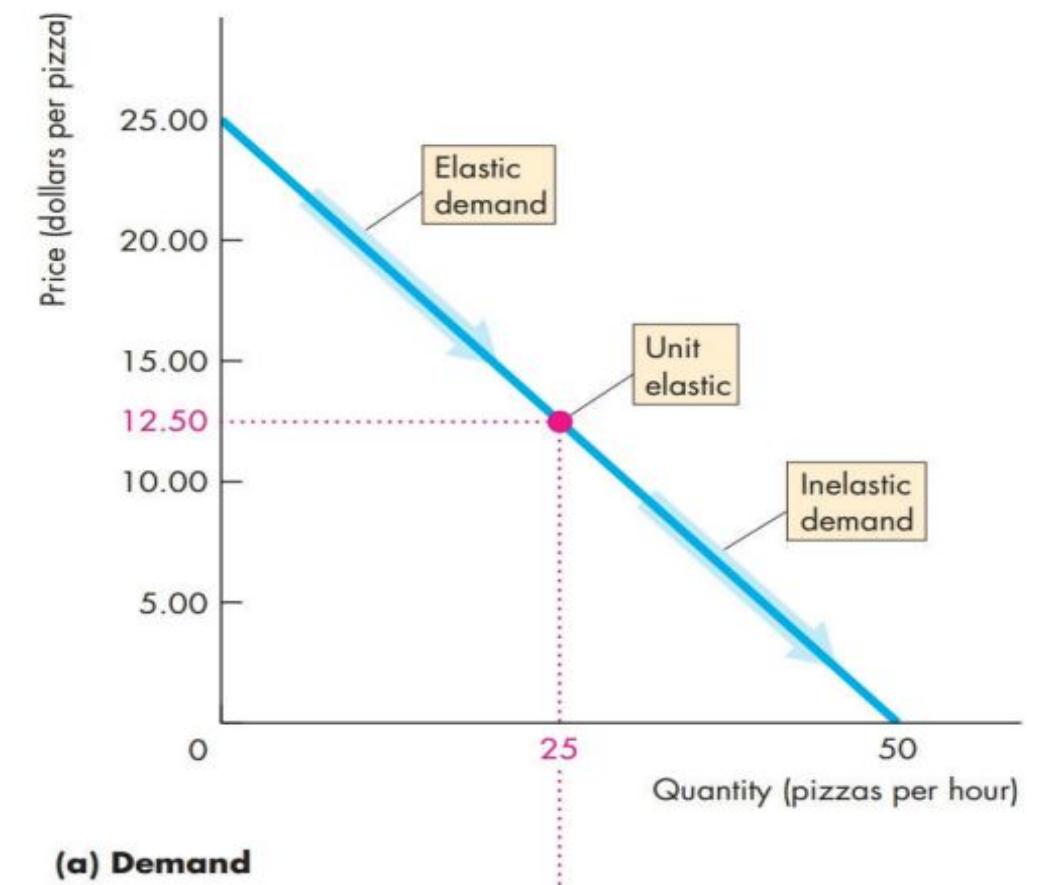
	perfectly inelastic	inelastic	unit elastic	elastic	perfectly elastic
Definition	Qd stays the same regardless of P	Qd reacts little to P changes	Qd changes in the same proportion as the change in P	Qd reacts alot to P changes	Qd changes by an infinitely large amount when P changes
ed range	$ed = 0$	$ed < 1 $	$ed = 1 $	$ed > 1 $	$ed = \infty $
graph					
examples	<ul style="list-style-type: none"> • insulin 	<ul style="list-style-type: none"> • food • shelter 		<ul style="list-style-type: none"> • cars • furnitures 	<ul style="list-style-type: none"> • 2 soft drinks side-by-side in a vending machine



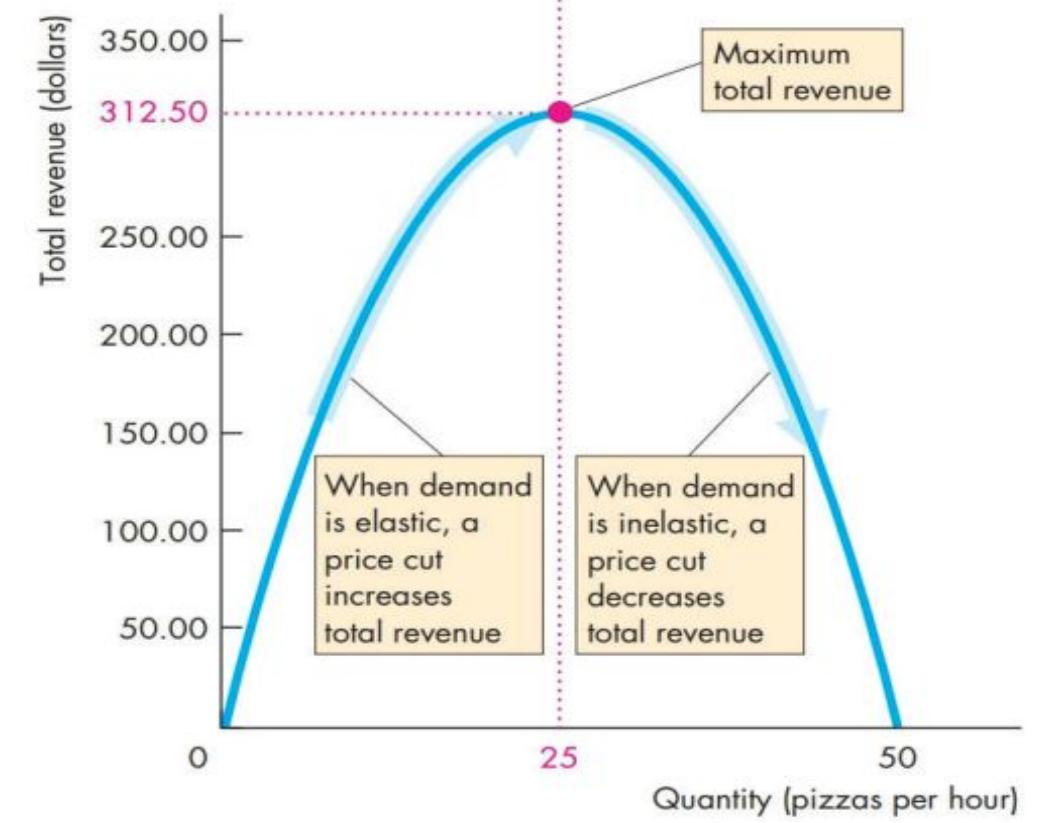
4. Elasticity - Total Revenue (TR)

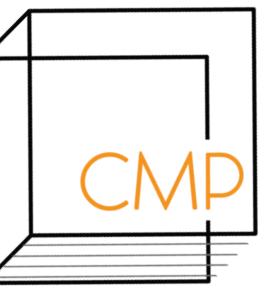


- $ed = \text{elastic}$
 - upper half of a linear demand curve
 - decrease price to maximize TR
- $ed = \text{inelastic}$
 - lower half of a linear demand curve
 - increase price to maximize TR
- $ed = \text{unit elastic}$
 - midpoint of a linear demand curve
 - maximizes TR



(a) Demand



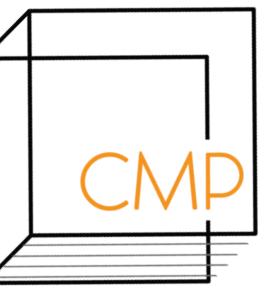


4. Elasticity - Total Revenue (TR)

Q6: The demand function for cough candies is $P = -Q_d + 25$. If the current price is \$12.50, how much should we change the price to maximize total revenue?

- a) decrease by \$4.25
- b) increase by \$3.50
- c) increase by \$2.50
- d) this price already maximizes profit.

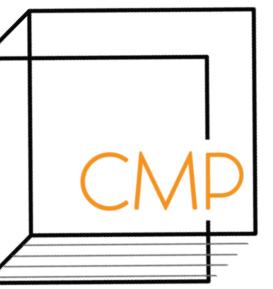




4. Elasticity - More Elasticity

- **cross elasticity:** how responsive demand for a good is when $P_{\text{substitute or complement}}$ changes
 - $ec = \frac{\% \Delta Q_d}{\% \Delta P_{\text{sub/complement}}}$
 - $ec < 0 \rightarrow \text{complement good}$: it's used with the good
 - $ec > 0 \rightarrow \text{substitute good}$: it can be used to replace the good
- **income elasticity:** how responsive demand for a good is when income changes
 - $ei = \frac{\% \Delta Q_d}{\% \Delta \text{income}}$
 - $ei \geq 1 \rightarrow \text{income elastic, normal good}$: 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





4. Elasticity

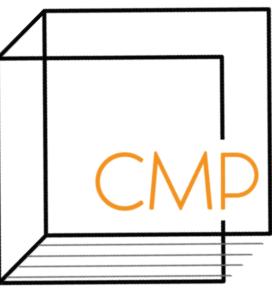
Q7: When the price for a bucket hat was \$25, the Qd was 30. When the price fell to \$20, Qd rose to 34. What's the price elasticity of demand?

- a) -1.3
- b) 1.50
- c) -0.56
- d) -0.90

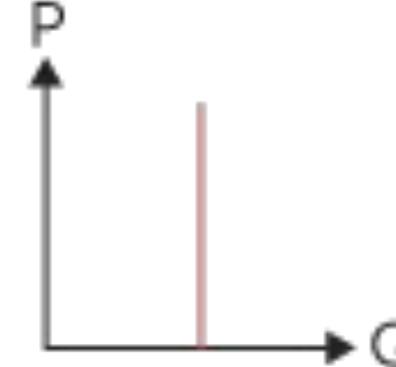
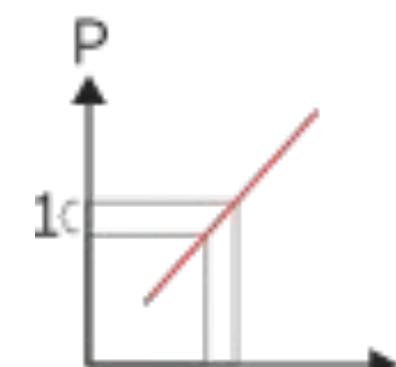
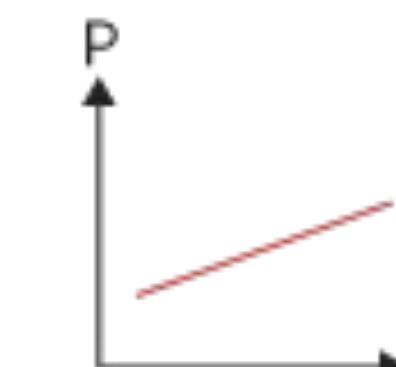
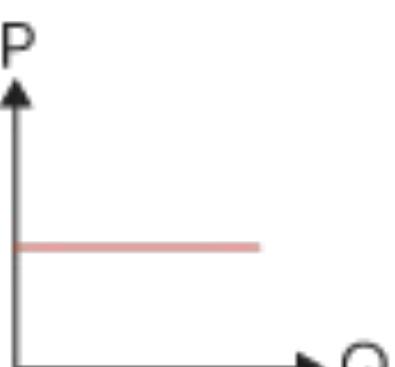
Q8: The income elasticity of blue mountain coffee beans is 1.5. That means it's a ____ good, and it's ____.

- a) inferior, income unit elastic
- b) normal, income elastic
- c) substitute, income elastic
- d) complementary, income inelastic

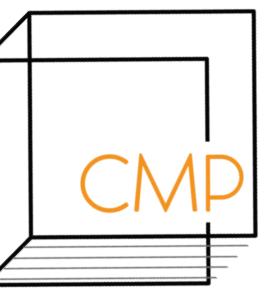




4. Elasticity - 5 Types of Es

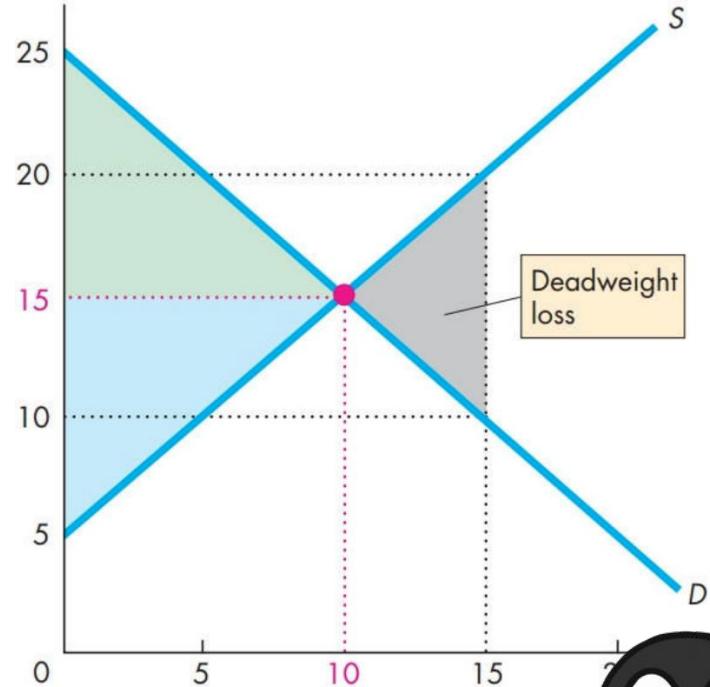
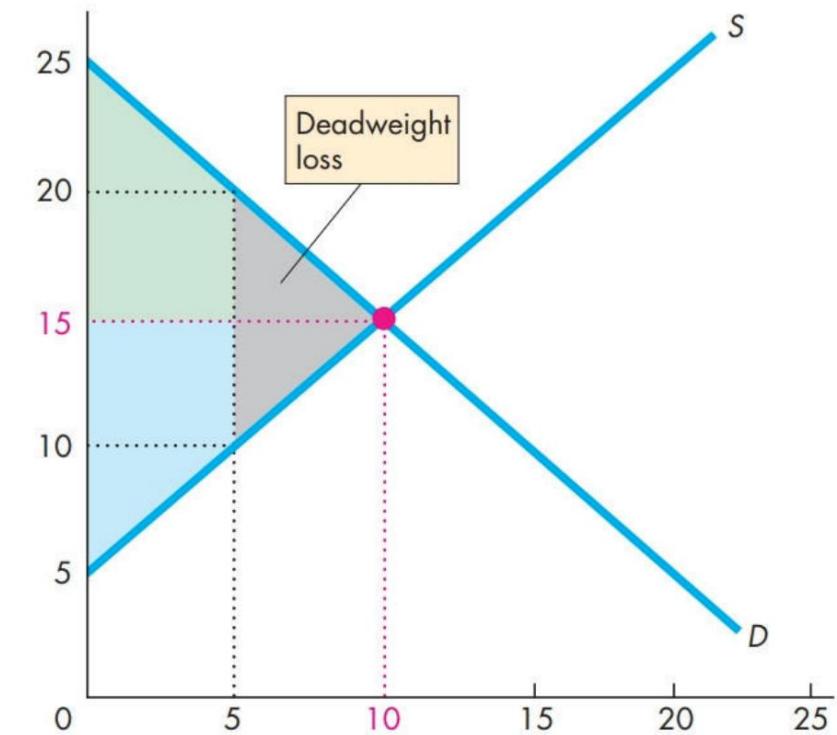
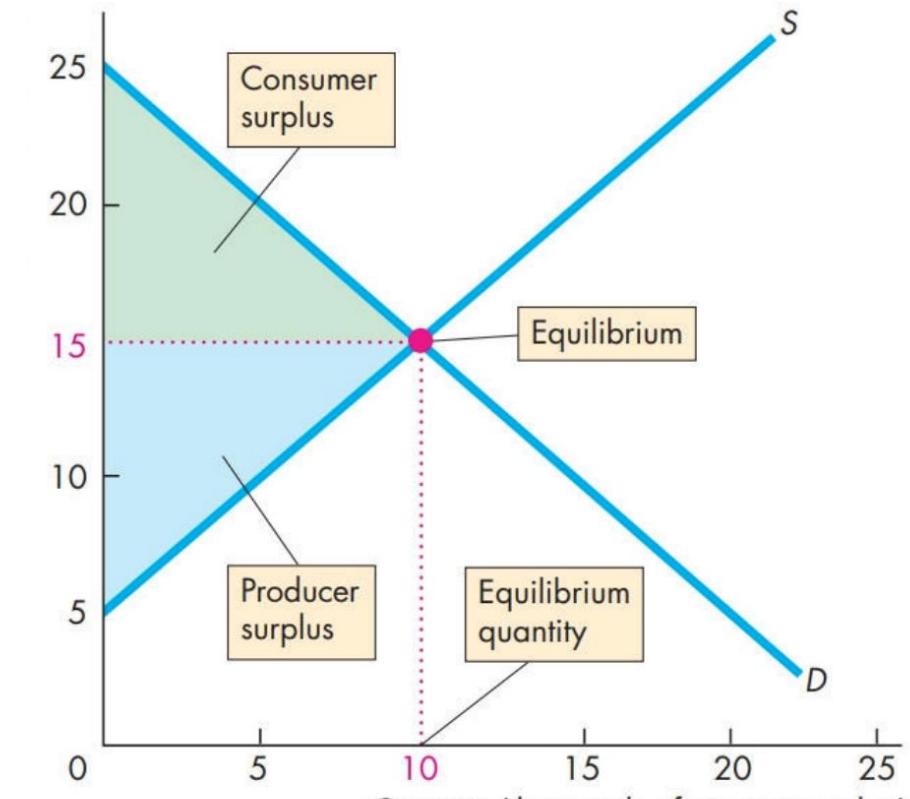
	perfectly inelastic	inelastic	unit elastic	elastic	perfectly elastic
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es range	$es = 0$	$es < 1 $	$es = 1 $	$es > 1 $	$es = \infty$
graph					
examples	<ul style="list-style-type: none"> • Van Gogh painting 				<ul style="list-style-type: none"> • goods that are produced in many countries

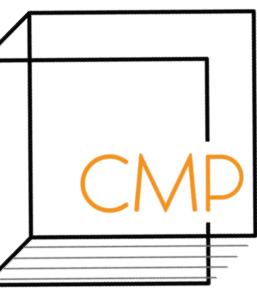




5. Surplus & Efficiency

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

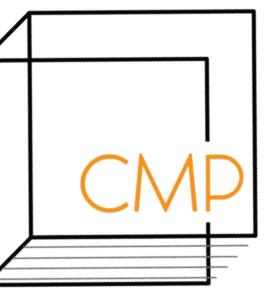




6. Global Market in Action

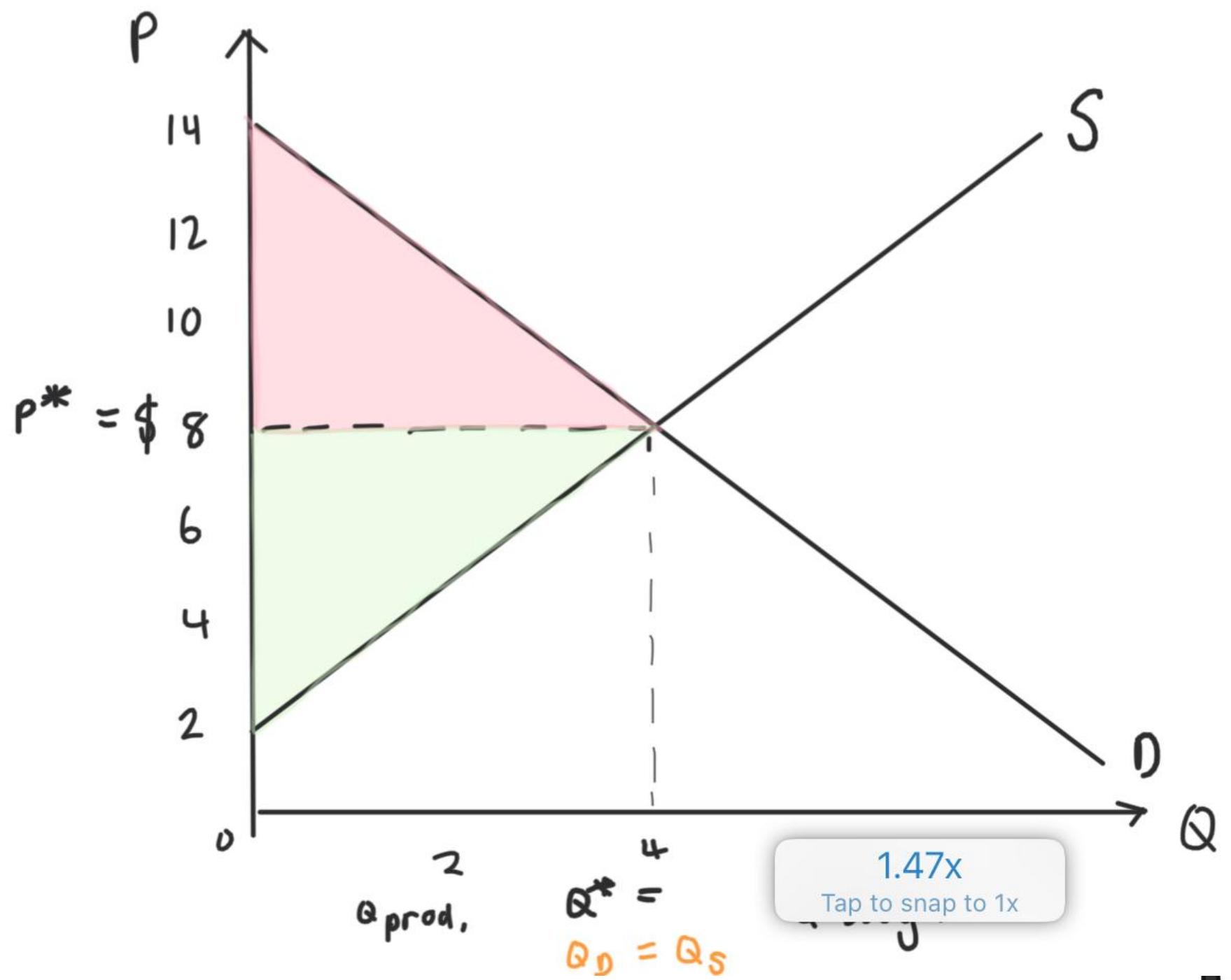
- **national comparative advantage** (a nation can produce a good/service at a lower OC than any other nation) > trade
 - **imports**: buy goods/services from other countries
 - **exports**: sell goods/services to other countries
- 6 Possible Situations:
 1. No trade
 2. Free trade where the world price (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





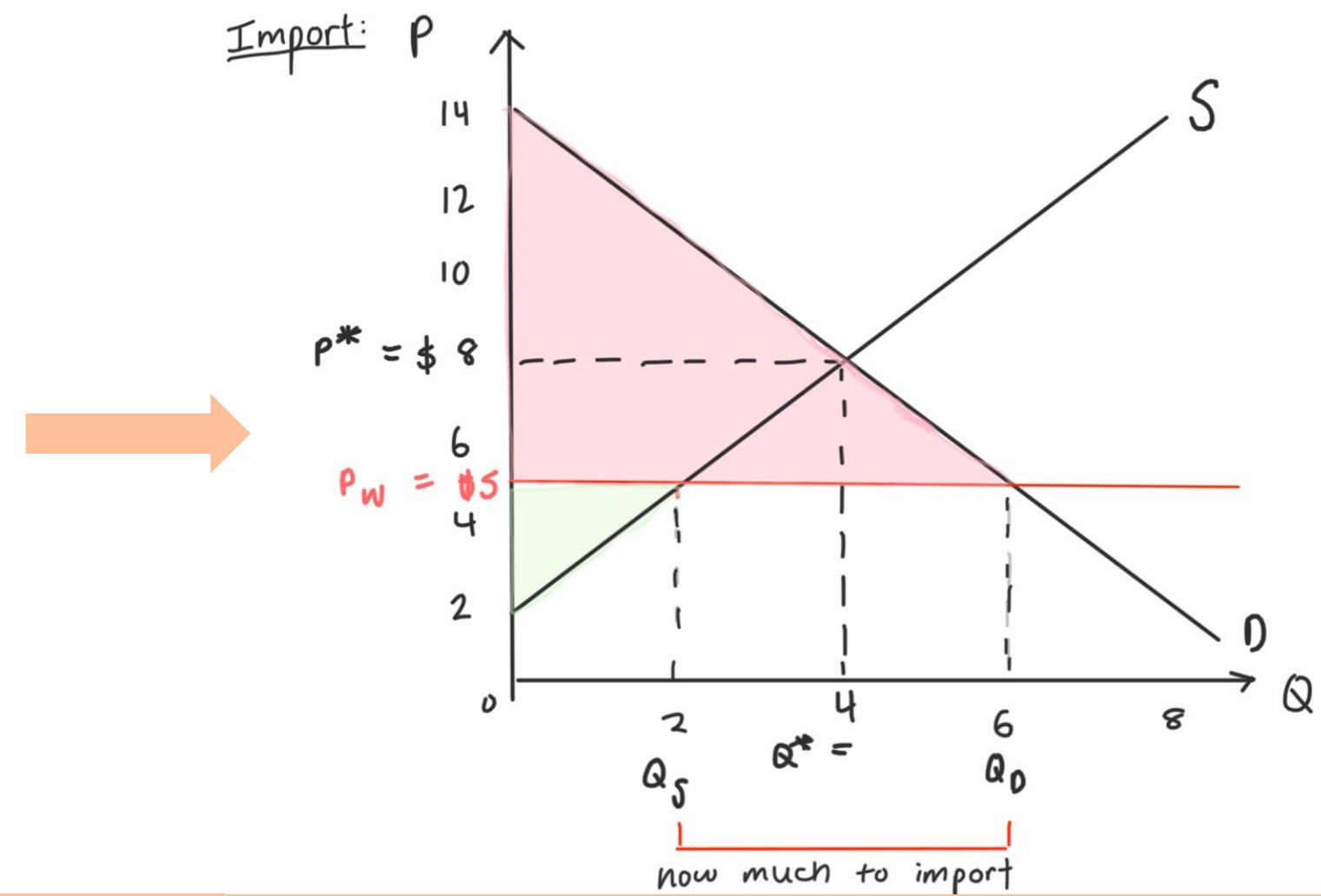
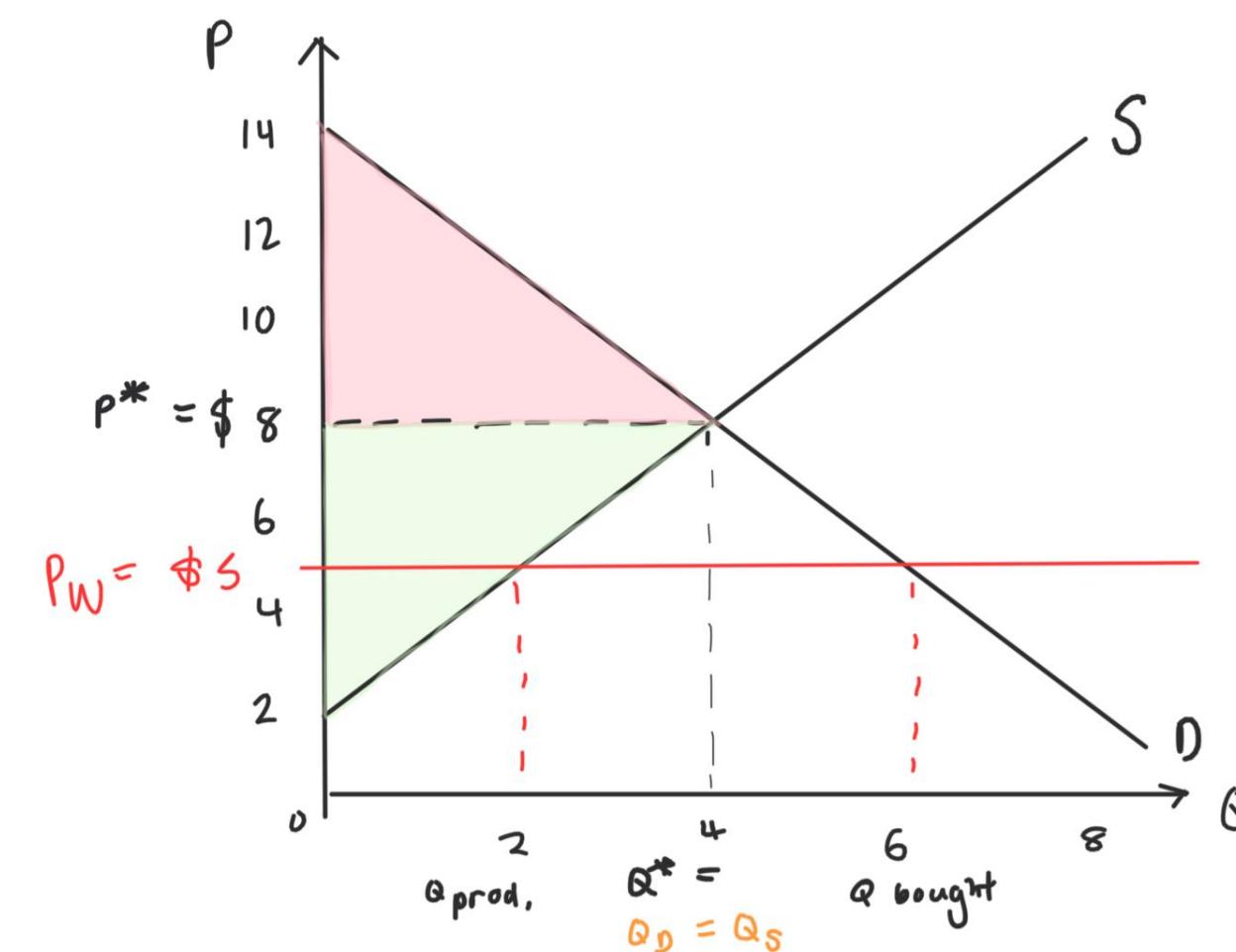
6. Global Market in Action - No Trade

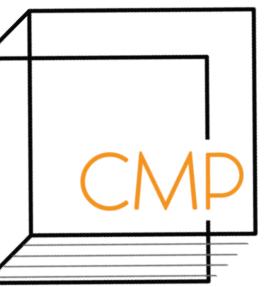
- Eg. Consider the Canadian domestic jeans market:
 - at first, the market is at EQM
 - no trade
 - $P^* = \$8$, $Q^* = 4$



6. Global Market in Action - Import

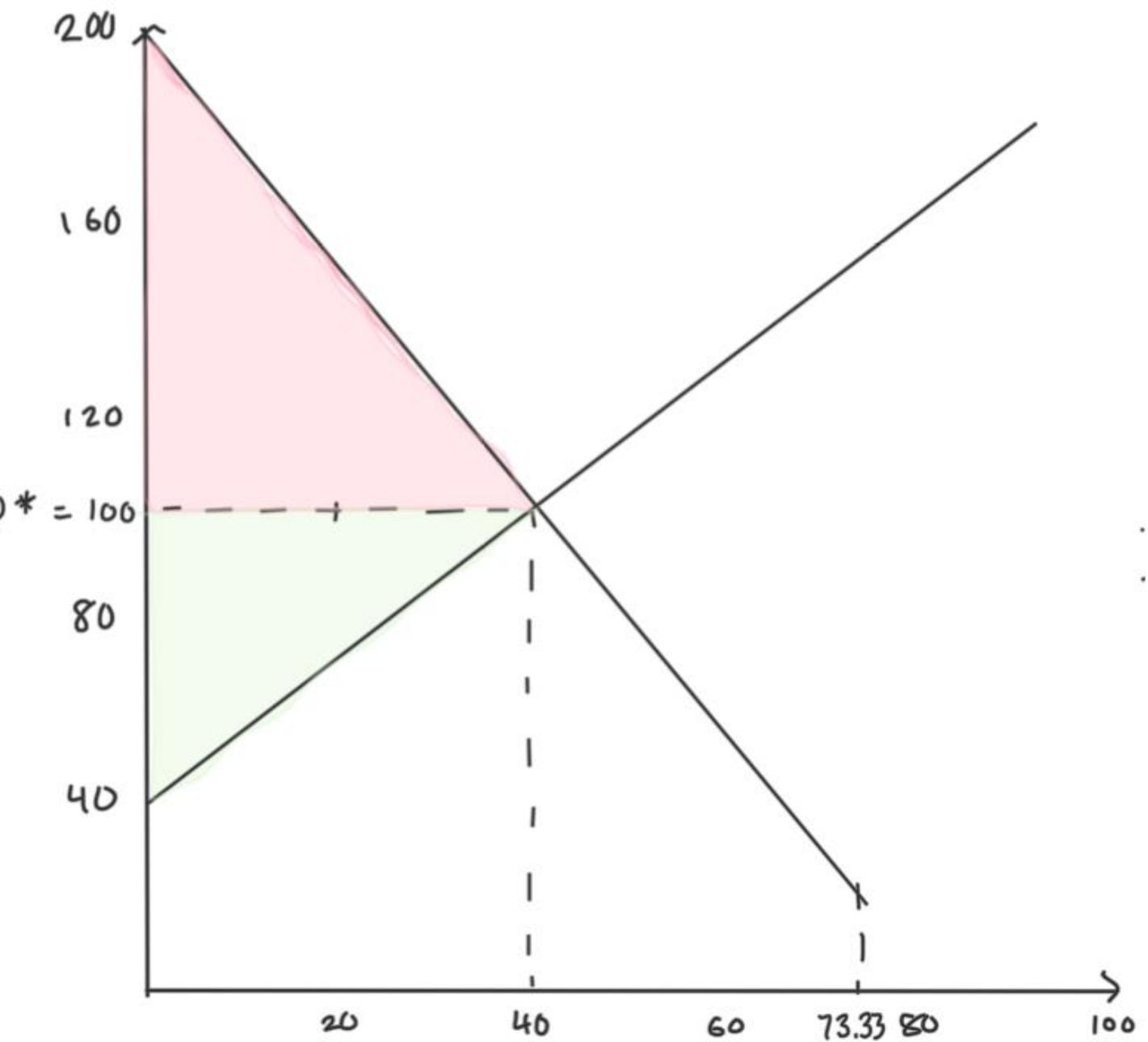
- Eg. Consider the Canadian domestic jeans market:
 - $P_w = \$5$ which is *lower* than P^*
 - Now, the price for a pair of jeans is determined by the world market not Canadian market
 - $D > S \rightarrow$ shortage \rightarrow import

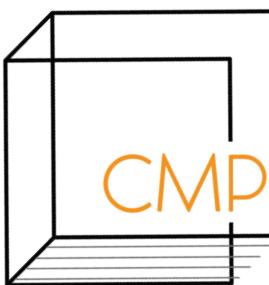




6. Global Market in Action - No Trade

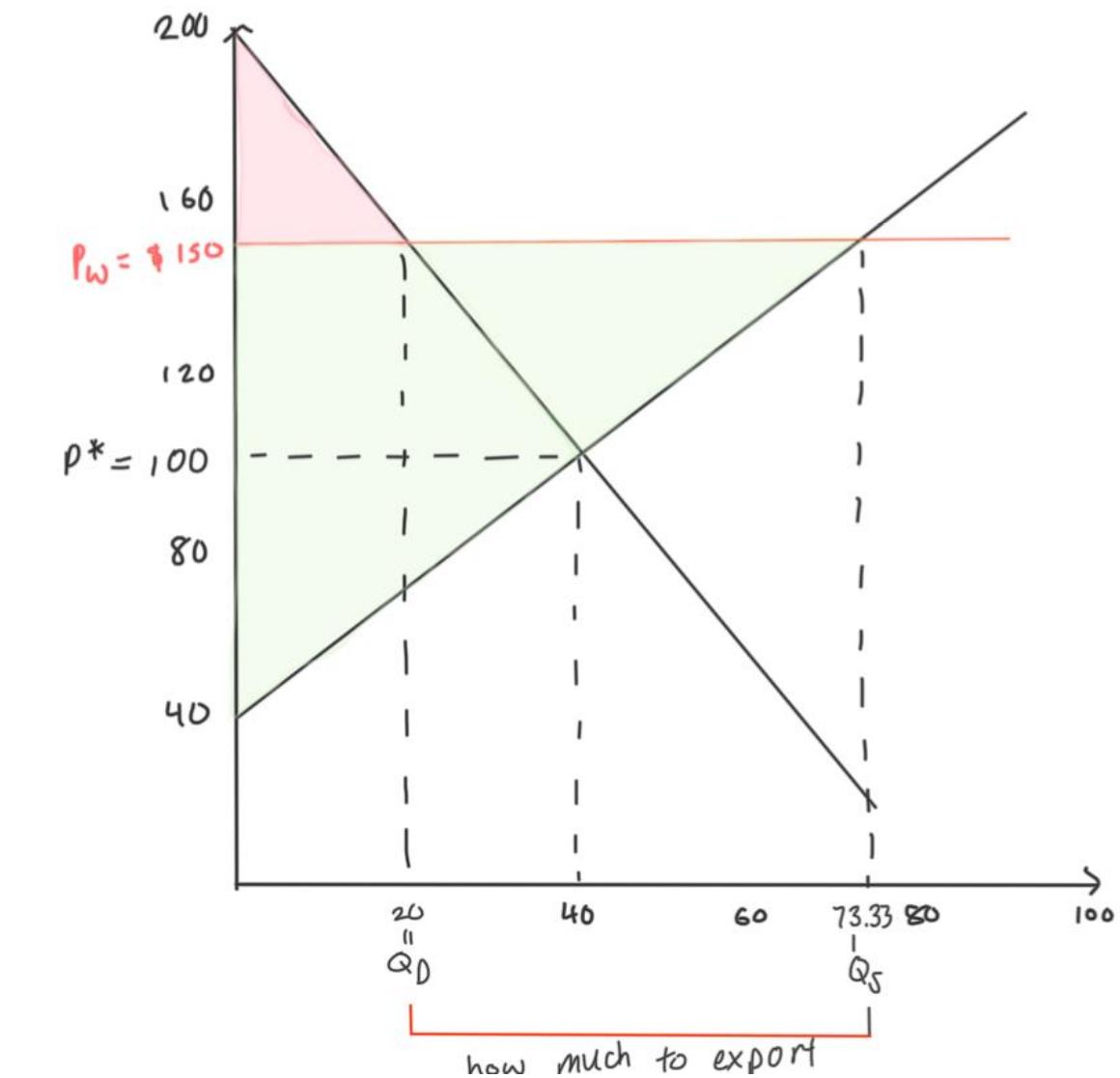
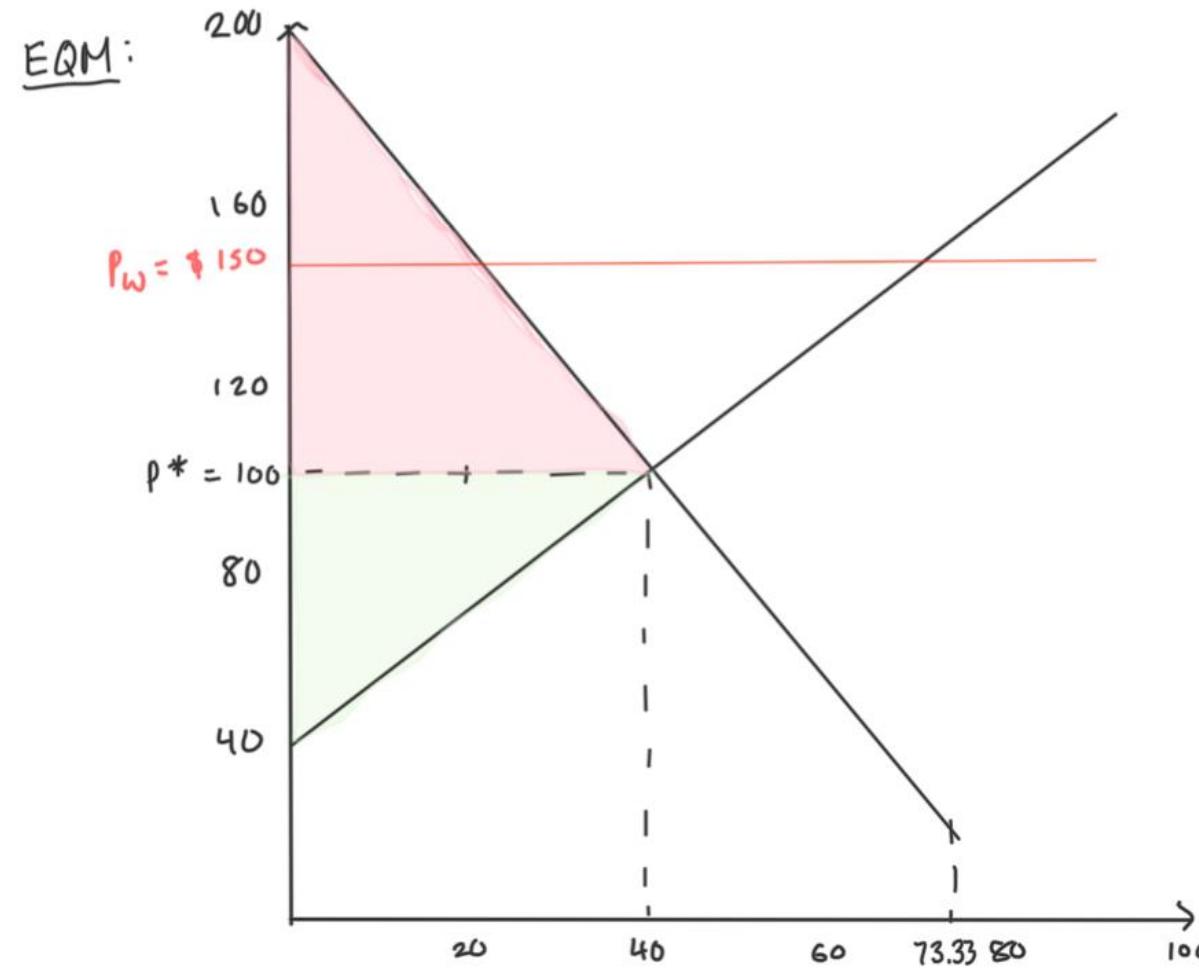
- Eg. Consider the Canadian domestic regional jet market:
 - at first, the market is at EQM
 - no trade
 - $P^* = \$100$, $Q^* = 40$

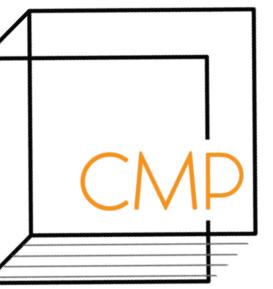




6. Global Market in Action - Export

- Eg. Consider the Canadian domestic regional jet market:
 - However, Canadians suppliers realize that the $P_w = \$150$ which is HIGHER than P^*
 - Now, the price for a jet is determined by the world market not Canadian market
 - $S > D \rightarrow$ surplus \rightarrow **export**



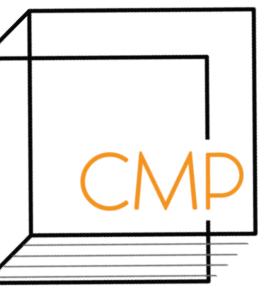


6. Global Market in Action - Imports & Exports

Q9: Who (Canada or rest of the world) has comparative advantage in jeans production? What about regional jet production?

Q10: Who (Canadian producer or consumers) gains and who loses in the jeans market? What about in the regional jet market?

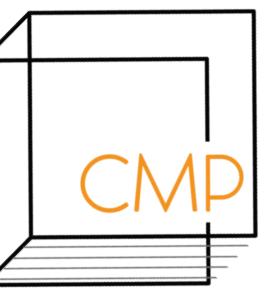




6. Global Market in Action - Tariffs on Imports

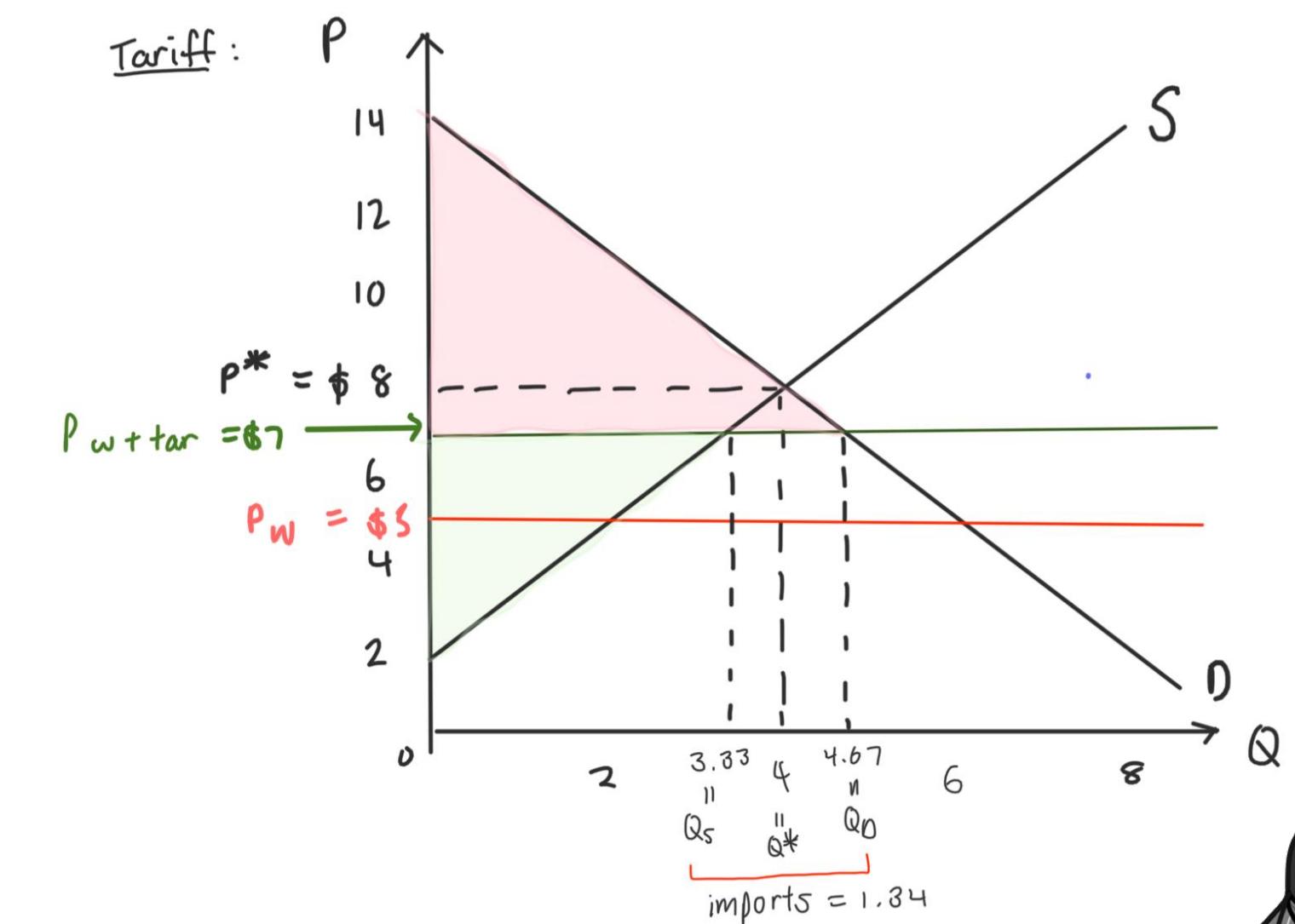
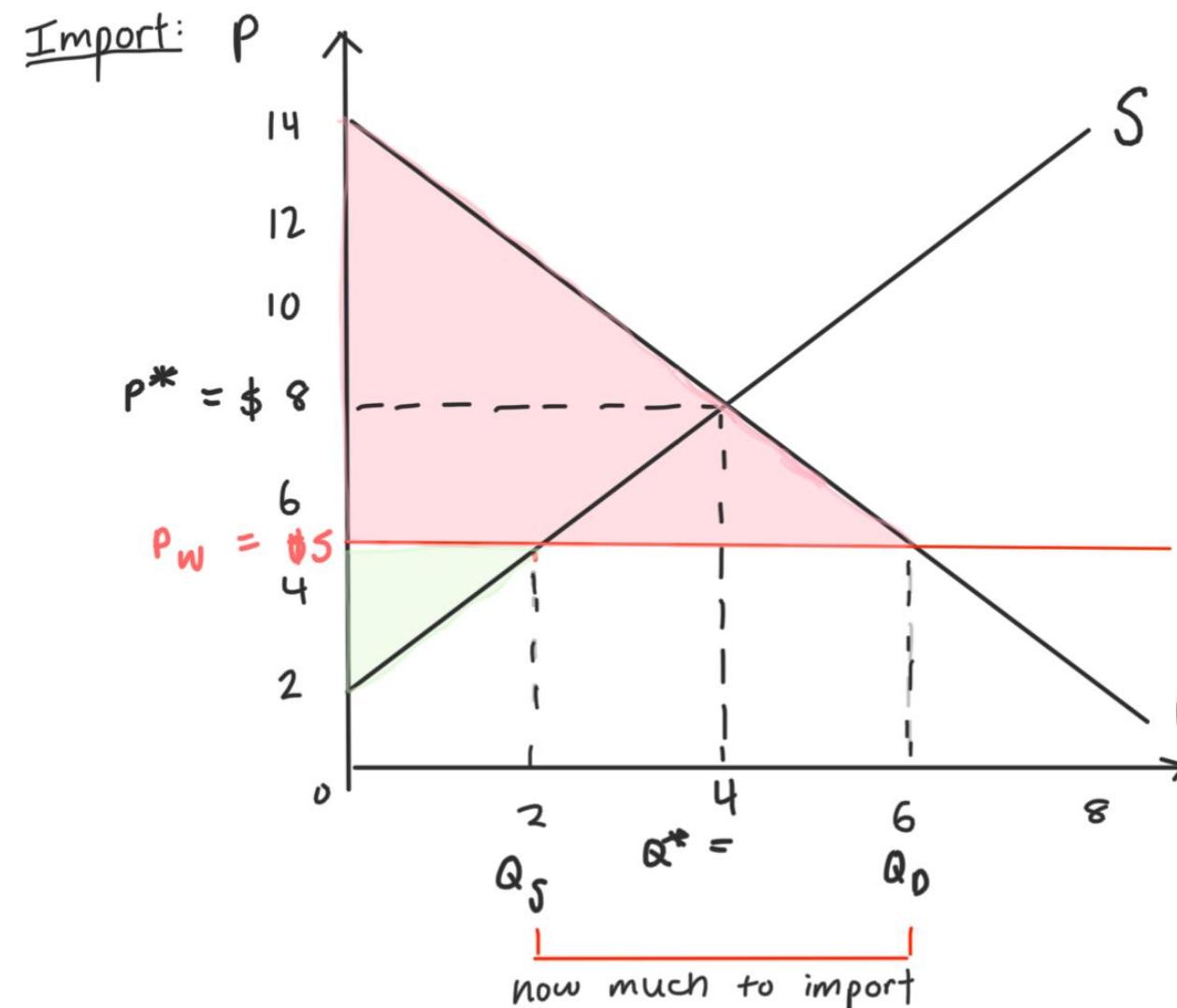
- **tariffs:** a tax on goods imposed by the importing country when imported goods enters the country
 - allows the government to earn revenue on imports
 - increases the cost of imports > decreases quantity imported and encourages consumers to buy from domestic producers > recover some PS for producers but leads to DWL

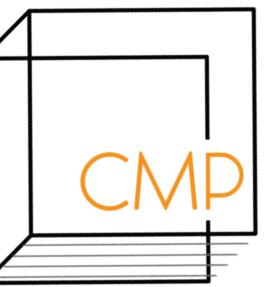




6. Global Market in Action - Tariffs on Imports

- Eg. Consider the Canadian domestic jeans market again:
 - government decides to impose a \$2 tariff/ pair of jeans > P_w increases by \$2 > Canadians import less because it's more expensive to import now

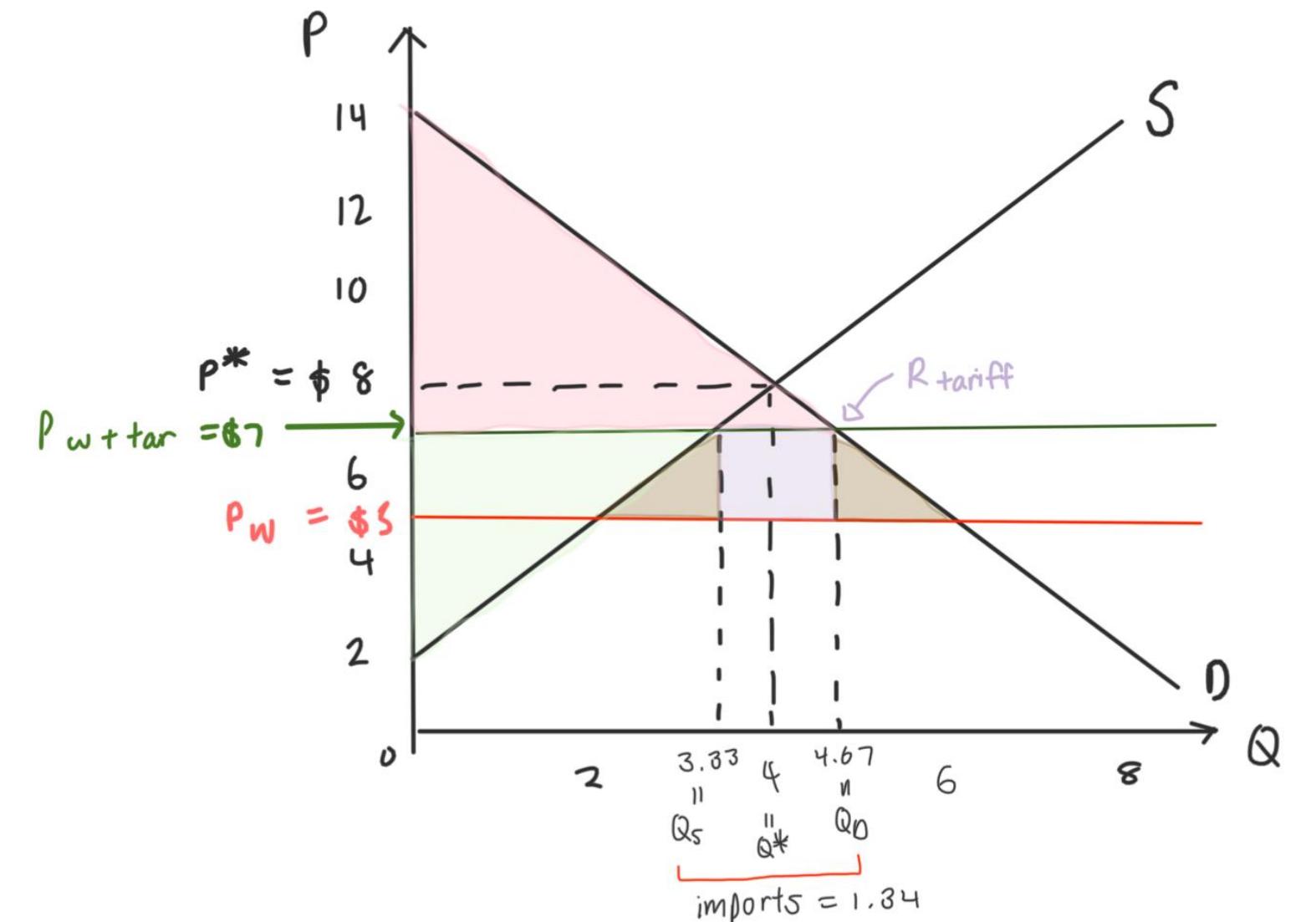




6. Global Market in Action - Tariffs on Imports

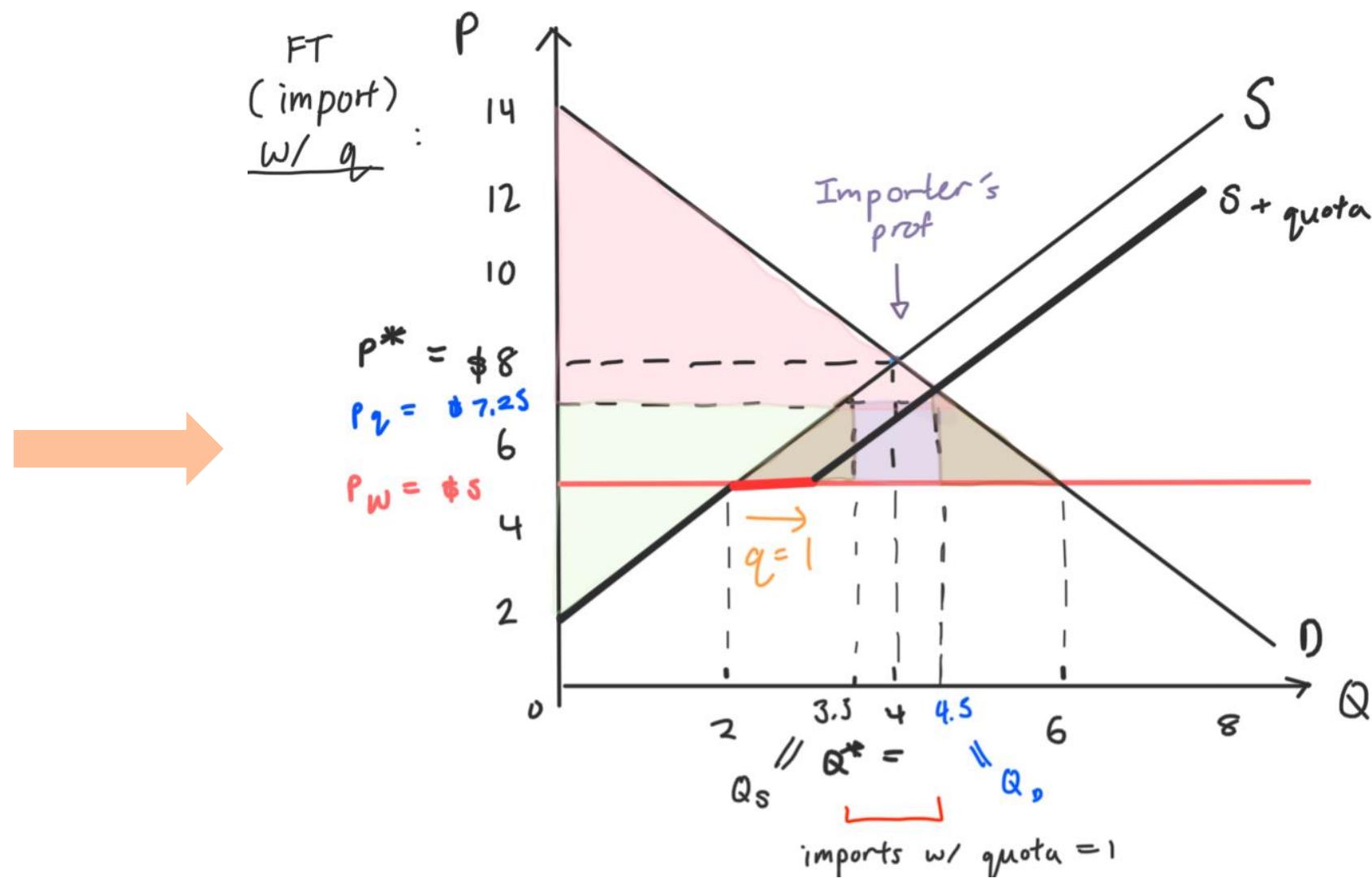
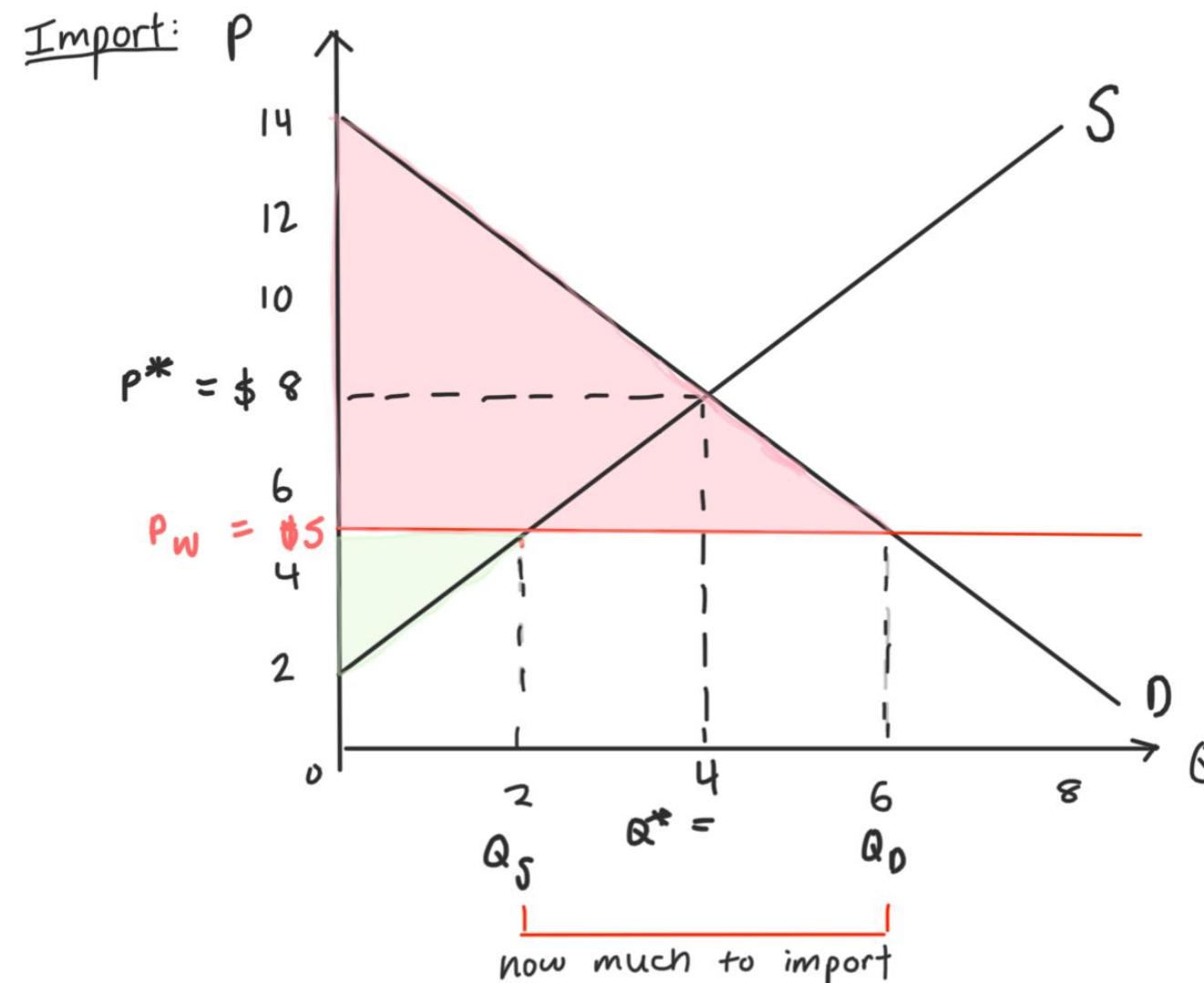
Q11: Is imposing a tariff efficient? If not, what's the total DWL and where are they on the graph?

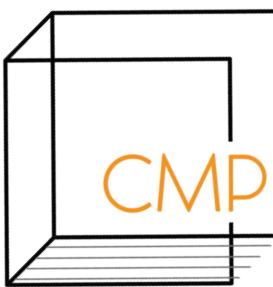
Q12: How much revenue does the government collect from tariffs?



6. Global Market in Action - Quota on Imports

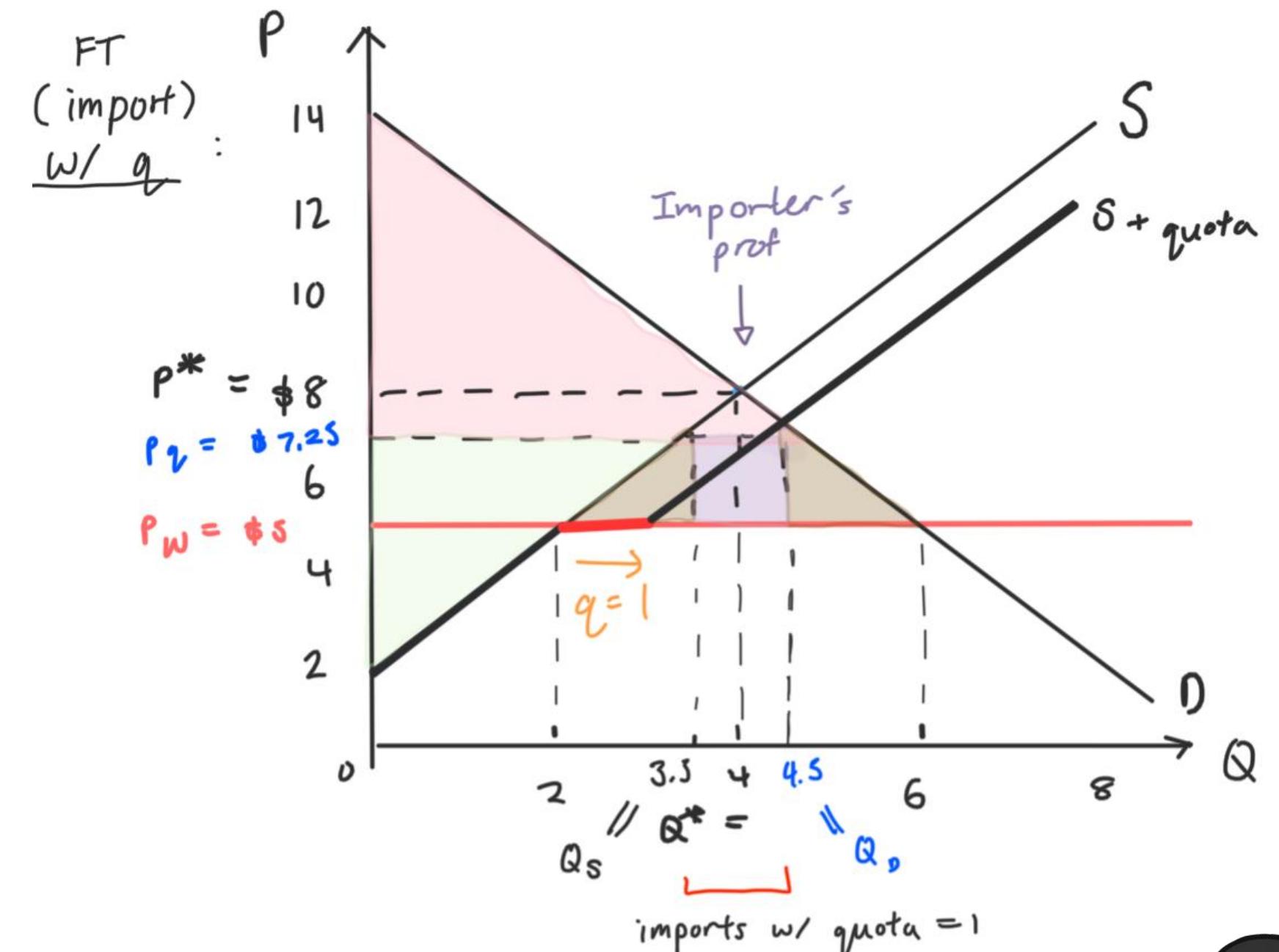
- **import quota:** limits the maximum amount of goods that can be imported
- Eg. Consider the Canadian domestic jeans market again:
 - Instead of a tariff, the government imposes an import quota where ONLY 1 pair of jeans can be imported





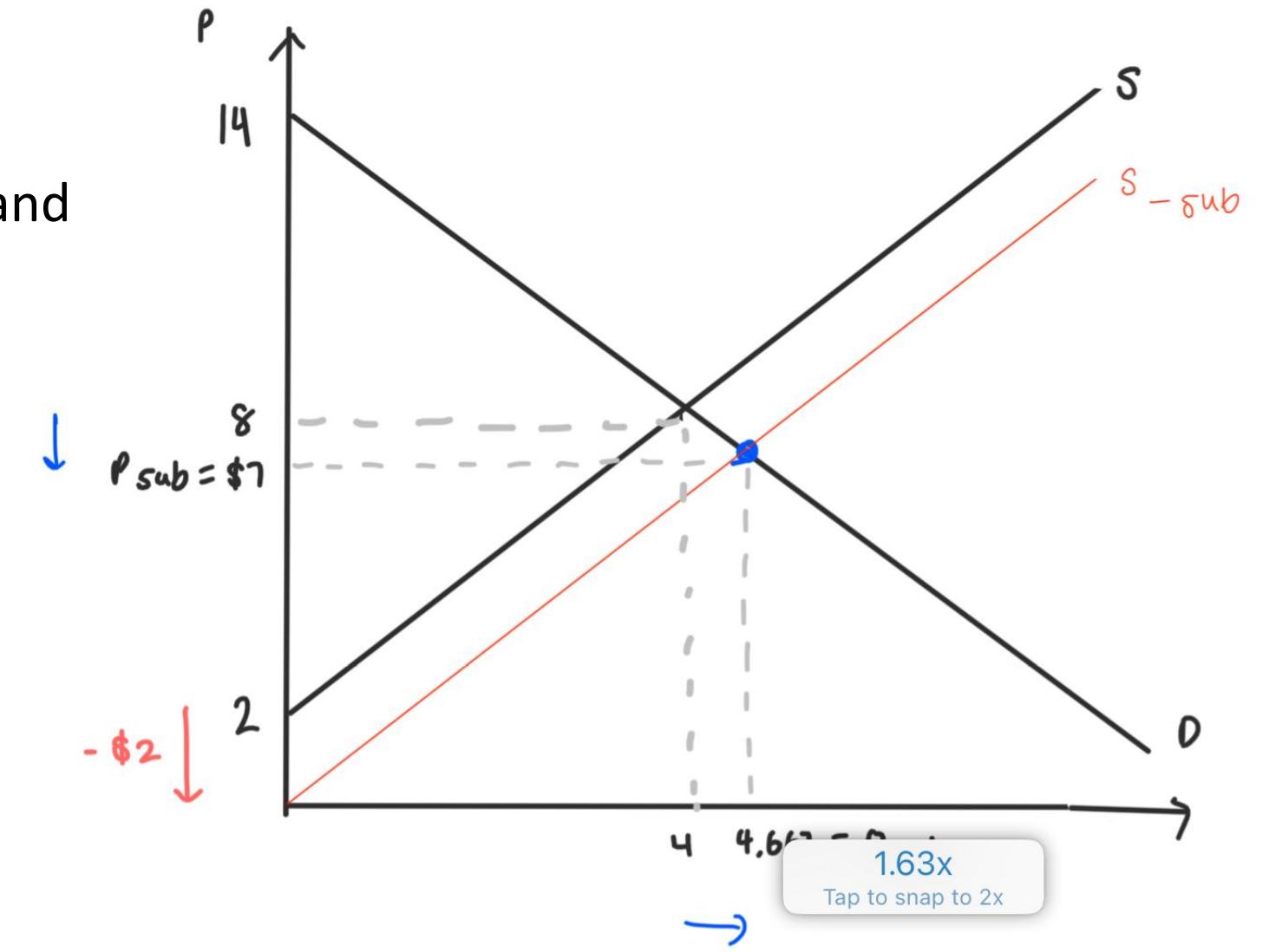
6. Global Market in Action - Quota on Imports

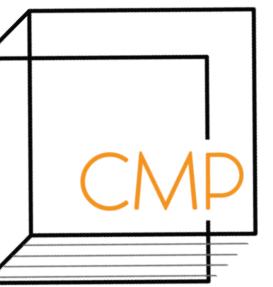
- the supply curve becomes ***S+quota***
- Eg. if the supply function is $Q_s = 0.67P - 1.33$,
 - when $P < P_w \rightarrow Q_s = 0.67P - 1.33$
 - when $P \geq P_w \rightarrow Q_s = 0.67P - 1.33 + 1$
- the new price that Canadians will pay for imports would now be the intersection point between the demand curve and ***S+quota*** curve
- the importer's profit = (quota)($P_q - P_w$)
- DWL



6. Global Market in Action - Subsidy on Exports

- **export subsidy:** when the government sponsors the domestic producer of the exported good
 - decreases P, increases Q
 - domestic producer gains, but overproduction in the domestic economy and underproduction in the rest of the world → DWL
- Eg. Consider the wood market
 - government pays lumberjacks a subsidy of \$2/ log
 - costs decrease > supply curve shifts to ***S-sub*** > produce more than Q^* > overproduction > export
 - S: $P = 1.5Q_s + 2$
 - ***S-sub***: $P = 1.5Q_s + 2 - 2$





6. Global Market in Action - Quota, Export Subsidy

Q13: The supply function for the cheese market is $P = 1.5Q_s + 2$, and the demand function is $P = -3Q_d + 5$. If a **quota of 3** is imposed, what's the new **S+quota** function?

- a) $P = 1.5Q_s + 5$
- b) $P = -3Q_d + 8$
- c) $Q_s = 0.67P + 1.67$
- d) $Q_d = 0.67P + 4.67$

Q14: What if a **export subsidy of \$3/ block of cheese** is imposed instead of a quota, what's the new **S-sub** function?

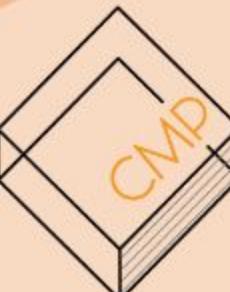
- a) $P = 1.5Q_s - 1$
- b) $P = -3Q_d + 3$
- c) $Q_s = 0.67P - 1.67$
- d) $Q_d = 0.67P - 1.33$

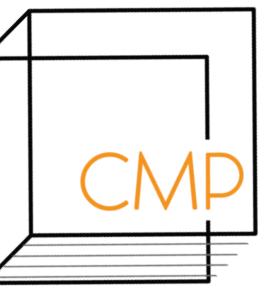


Break Time!



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!

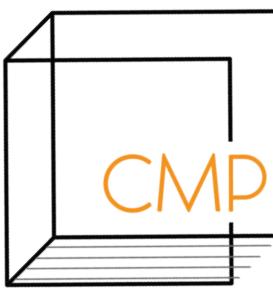




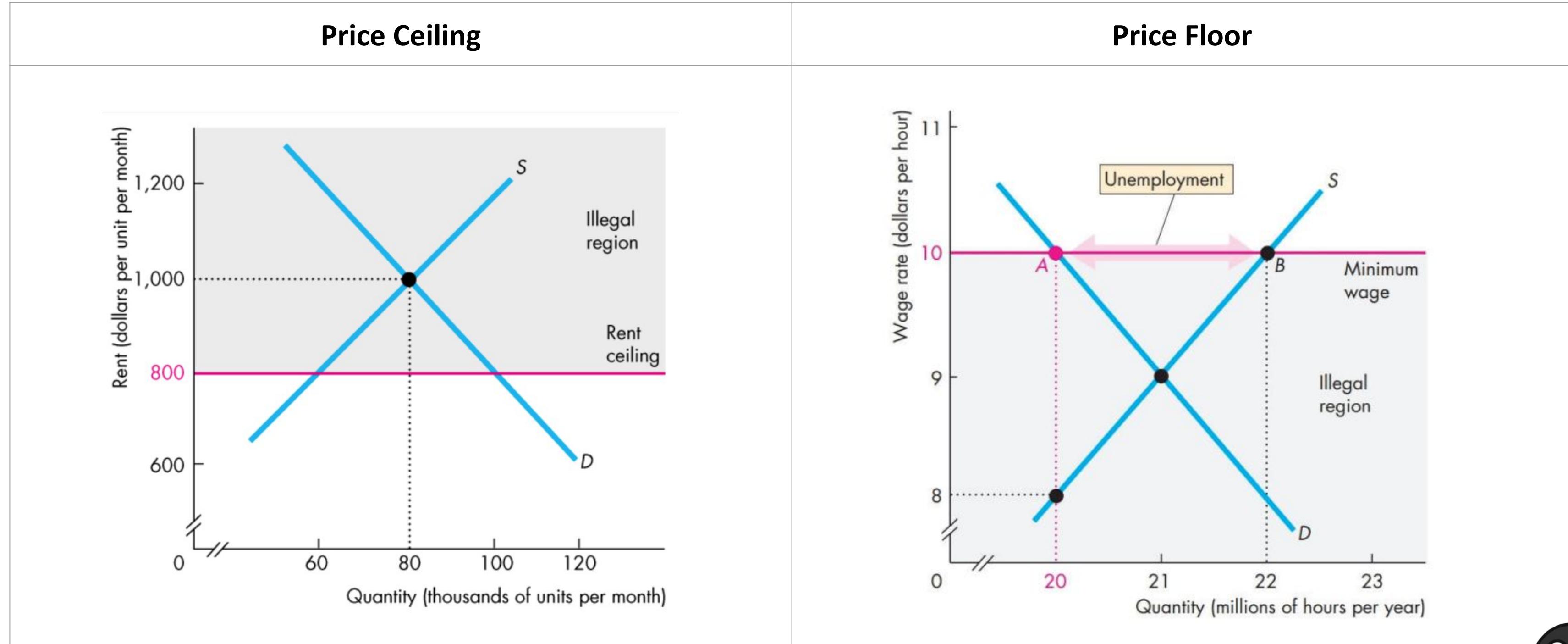
7. Government Actions in Market - Regulations on the Price

	Price Ceiling	Price Floor
Definition	when it's illegal to charge <i>above</i> a certain price	when it's illegal to charge <i>below</i> a certain price
Goal	Decrease price	Increase price
How?	Price ceiling $< P^*$	Price floor $> P^*$
Market Failure	underproduction	underproduction
Consequence	$D > S \rightarrow$ shortages	$S > D \rightarrow$ surplus
Eg.	Rent market	Labour market

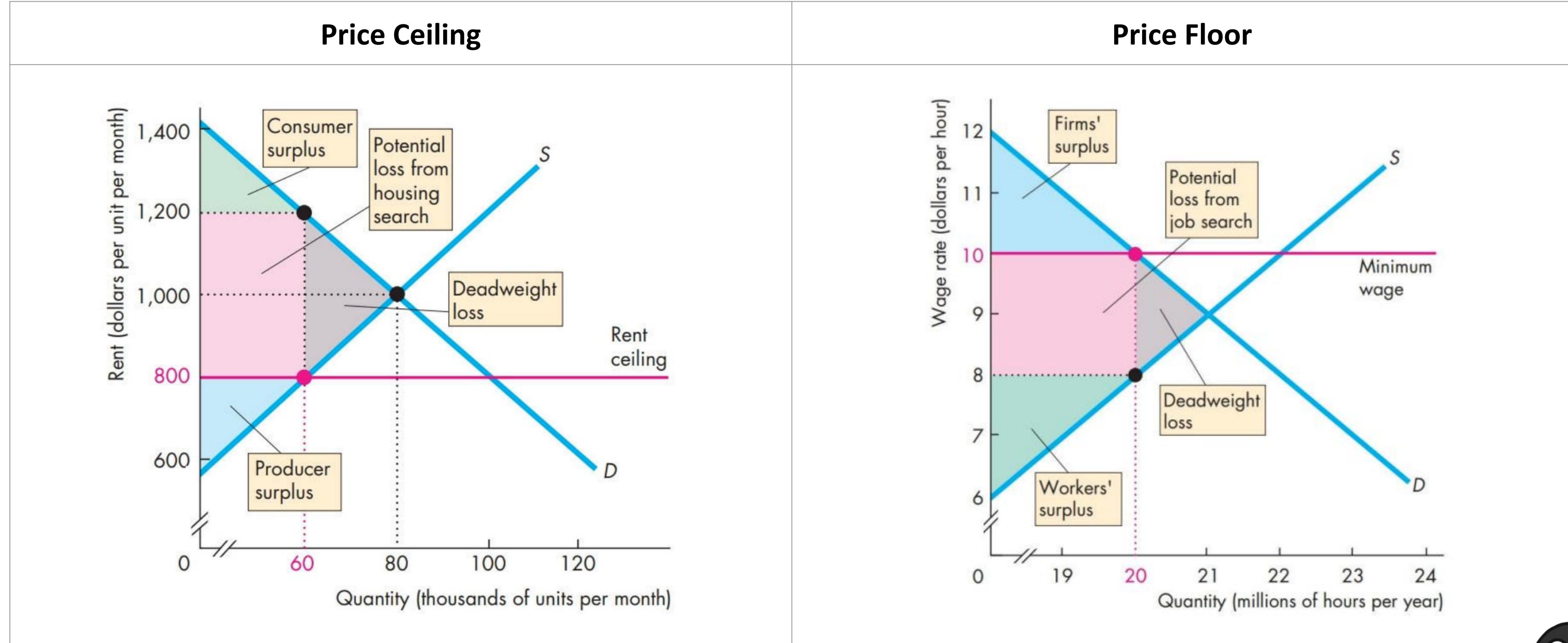


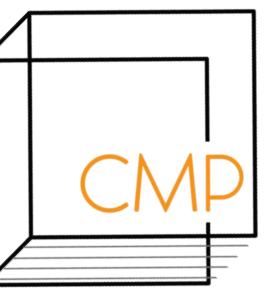


7. Government Actions in Market - Regulations on the Price



7. Government Actions in Market - Regulations on the Price

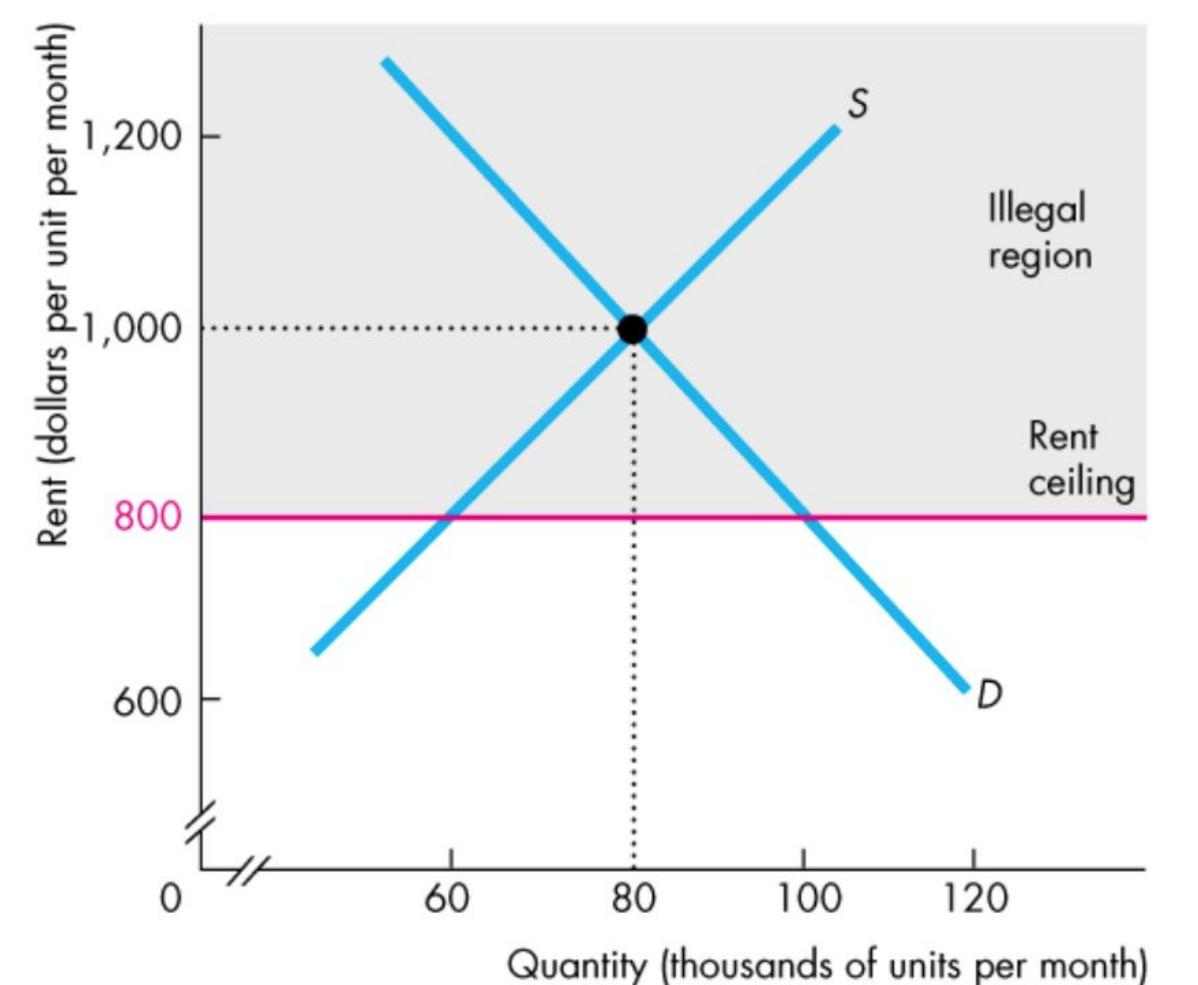


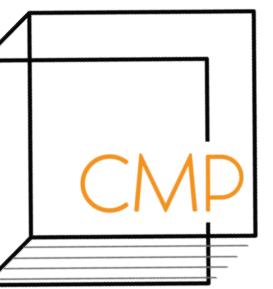


7. Government Actions in Market - Price Ceiling

Penny has always wanted to live alone, but the prices to rent an apartment are too expensive. Recently, she heard that a rent ceiling will be implemented and she was overjoyed at the news, thinking she'll finally be able to find and afford a home of her own.

Q15: Is Penny right? Would it be easier to find an apartment after the rent ceiling is implemented? Why or why not? (*Hint: Compare Q_d and Q_s at the rent ceiling price*)



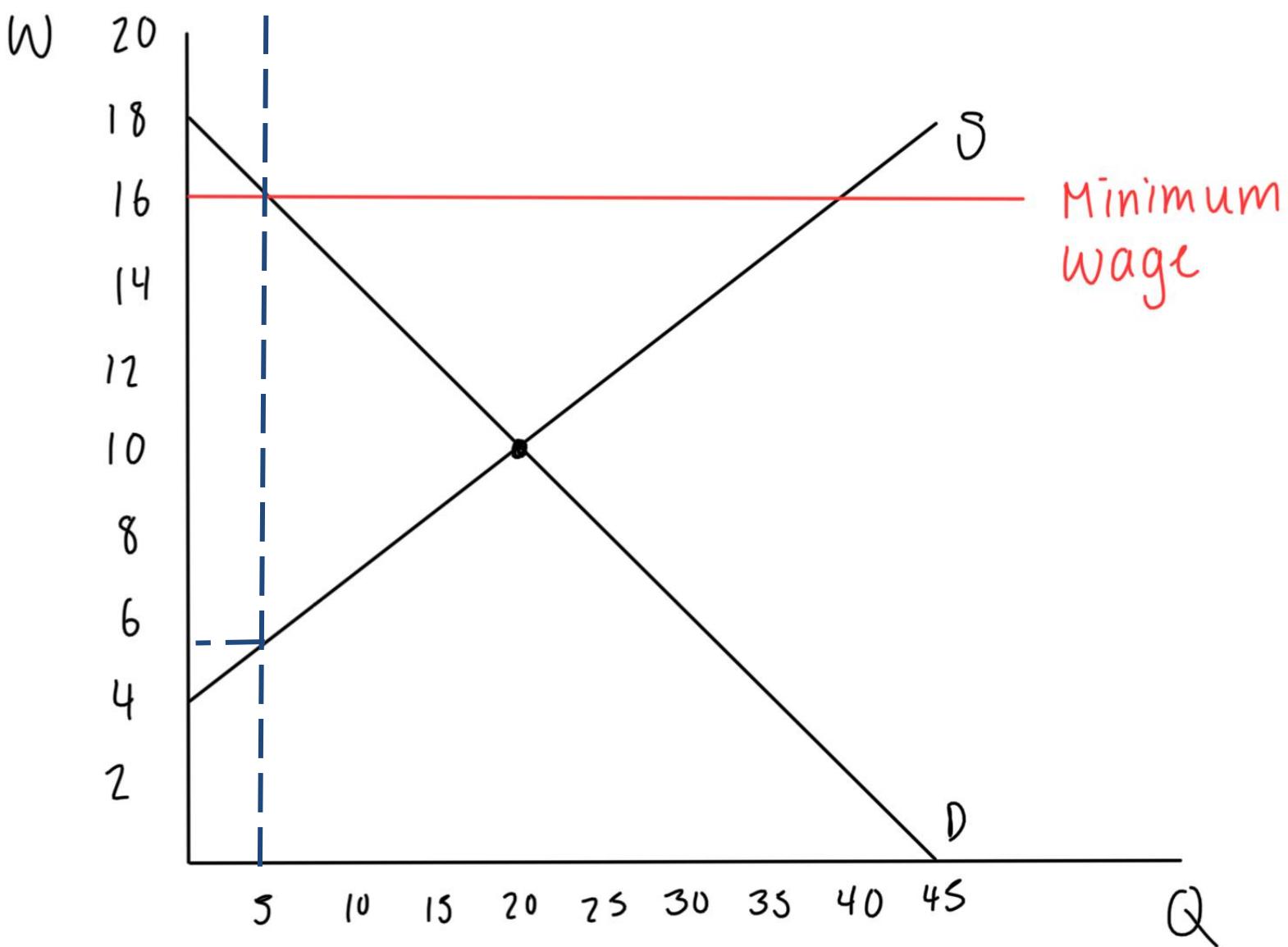


7. Government Actions in Market - Price Floor

The demand function in a labour market is $W = -0.4Q_d + 18$, and the supply function is $W = 0.3Q_s + 4$. If the government implements a minimum wage of \$16/hr, answer the following questions:

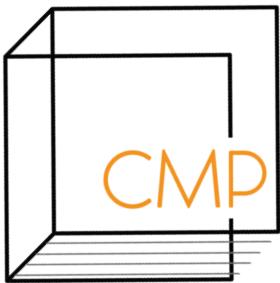
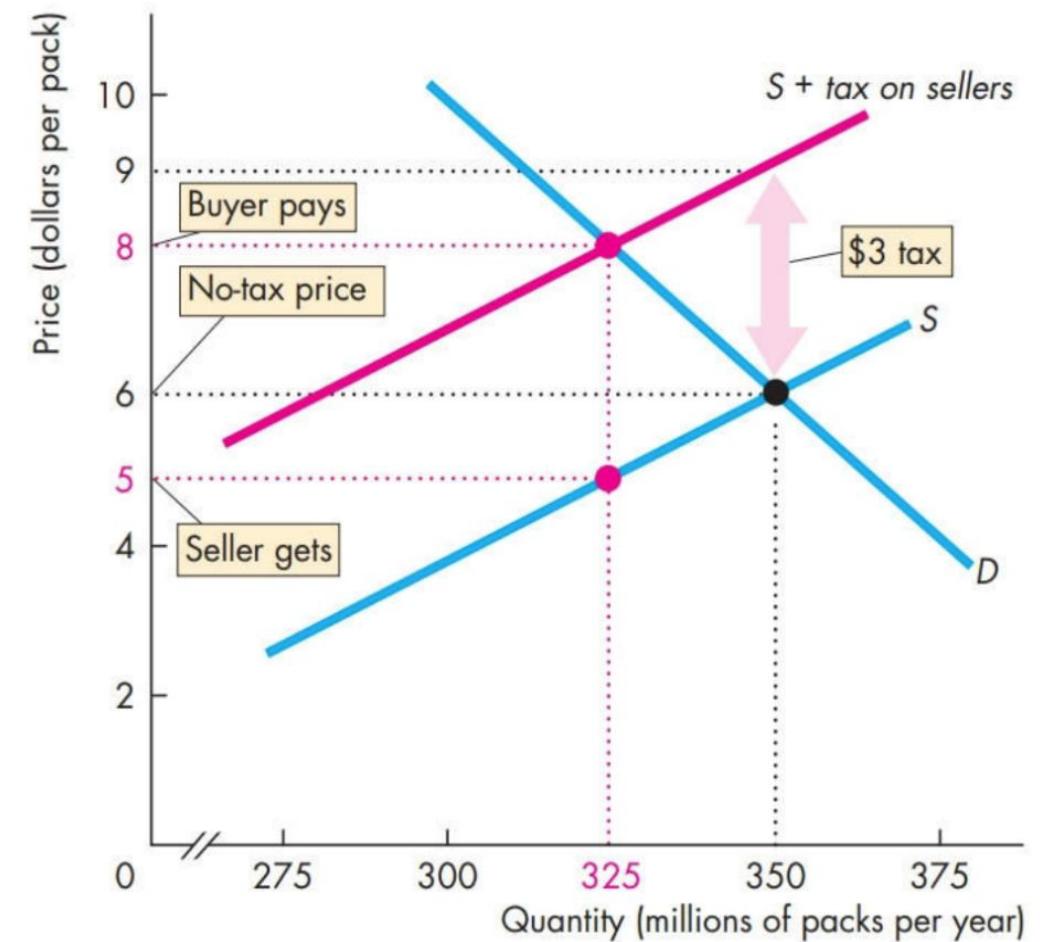
Q16: Who's the supplier and who's the consumer of the labour market?

Q17: Calculate the CS, PS, and DWL.

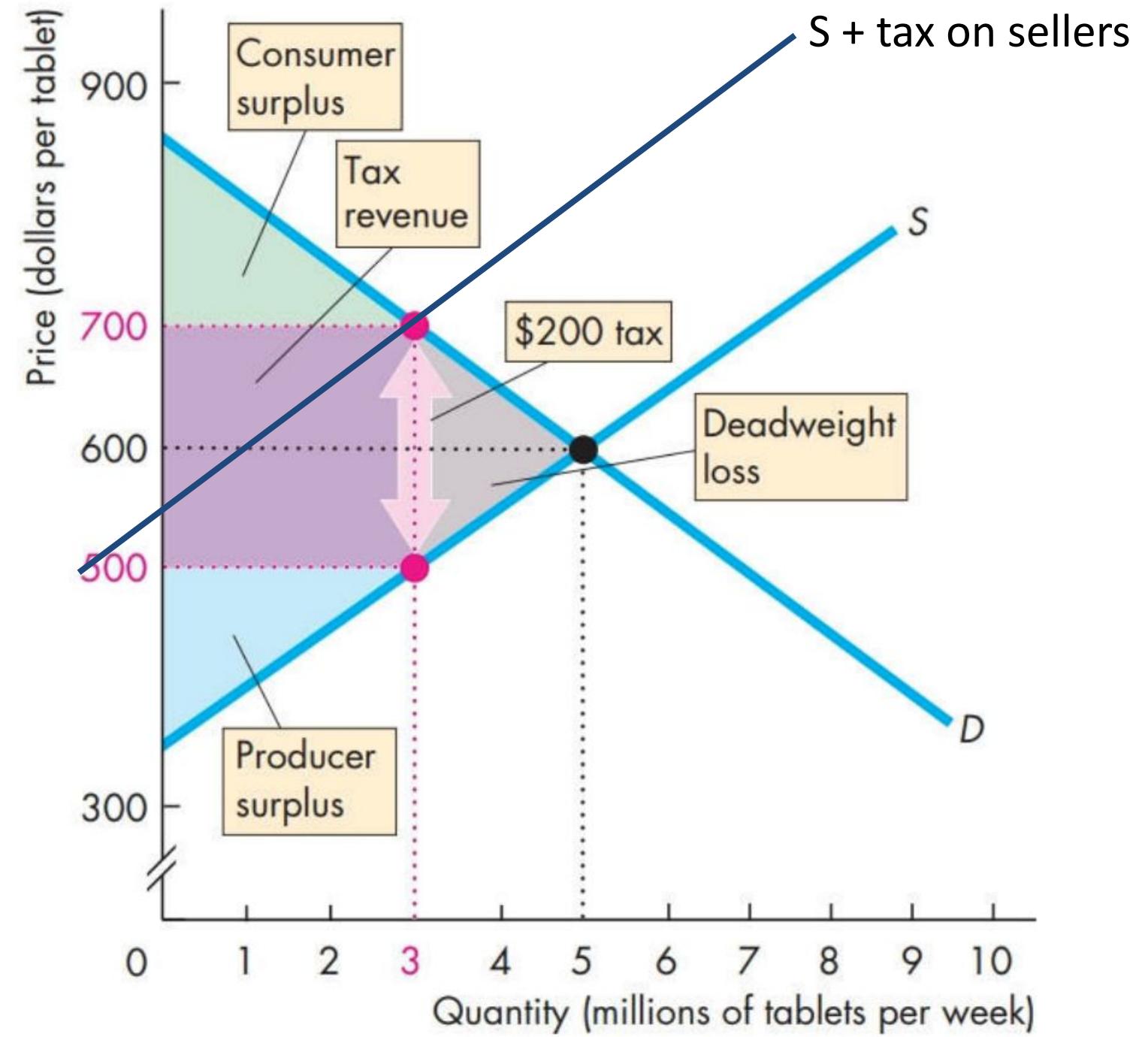


7. Government Actions in Market - Taxes

- **tax incidence:** division of the burden of a tax between the seller and buyer
 - increases P, decreases Q
- if taxes are imposed on the seller...
 - costs rise > supply curve shifts to ***S + tax on sellers***
- if taxes are imposed on the buyer
 - the amount the buyer is willing to pay the seller decreases > demand curve shifts to ***D – tax on buyers***
- No matter who the taxes are imposed on, the result is the same



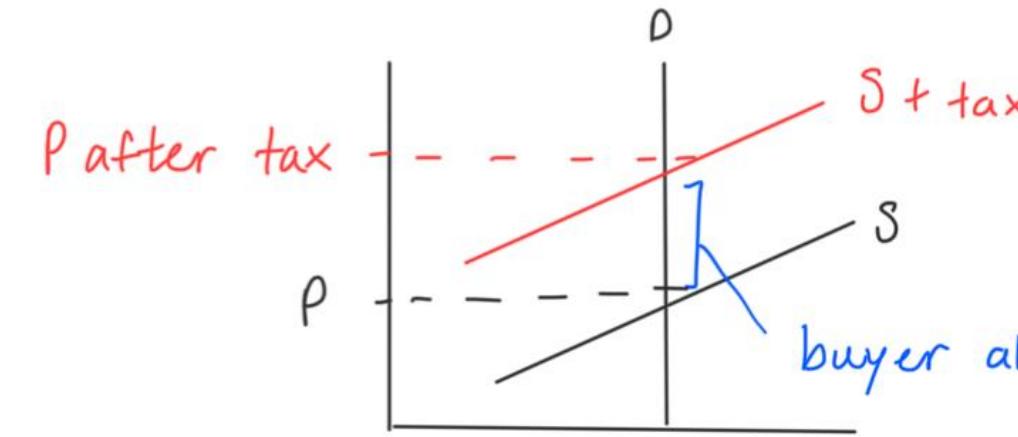
7. Government Actions in Market - Taxes



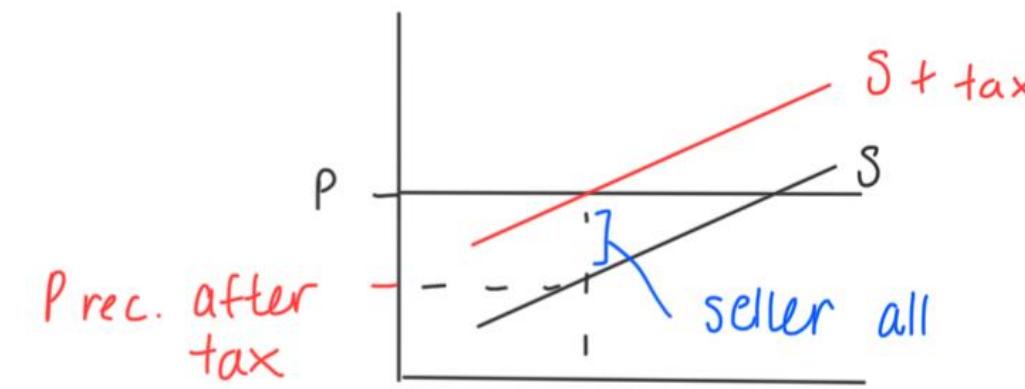
7. Government Actions in Market - Taxes

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

1) Perfectly Inel. D :

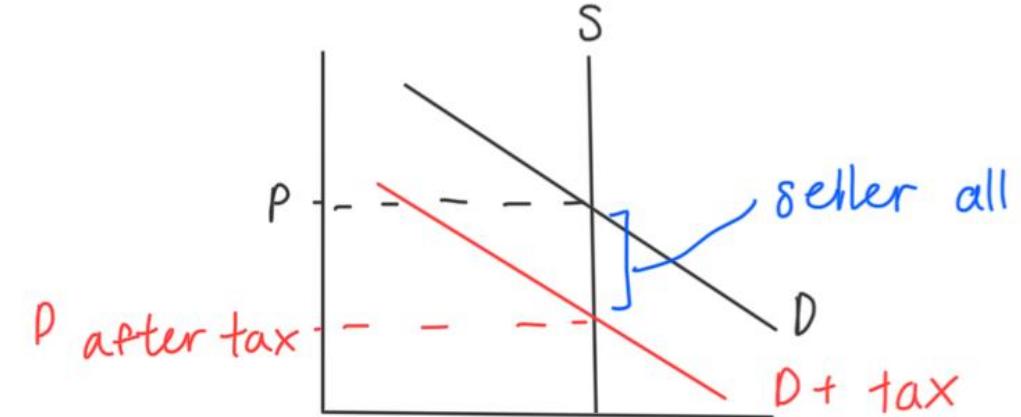


2) Perfectly El. D :

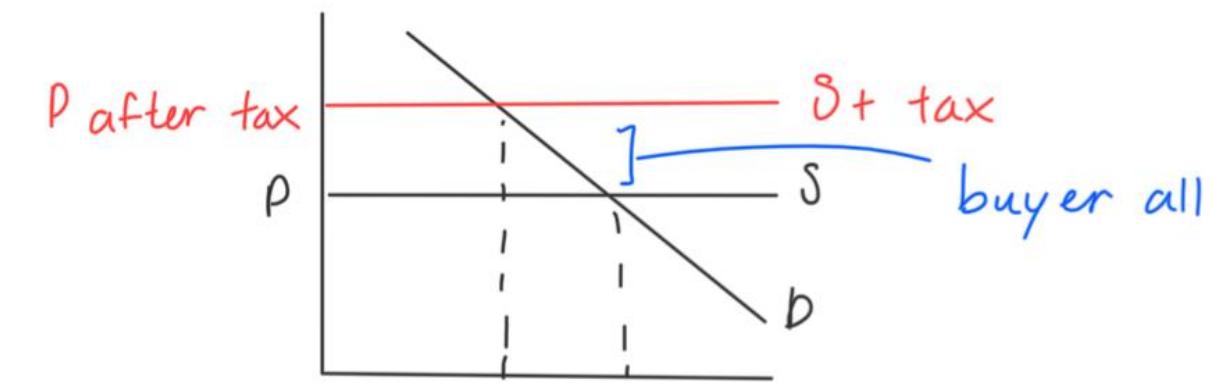


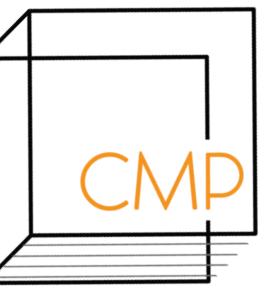
The more inelastic es is, the higher the seller's share of taxes

3) Perfectly Inel. S:



4) Perfectly El. S :





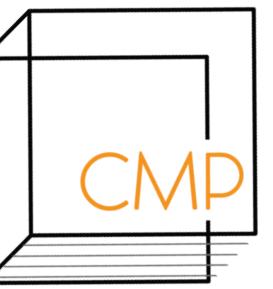
7. Government Actions in Market - Taxes, Production Quota, Subsidy

Q18: Goods like alcohol, cigarette and gas typically have inelastic demand. If a tax is imposed on them, who would pay more of the tax?

- a) buyer
- b) seller
- c) both will pay equal share
- d) government

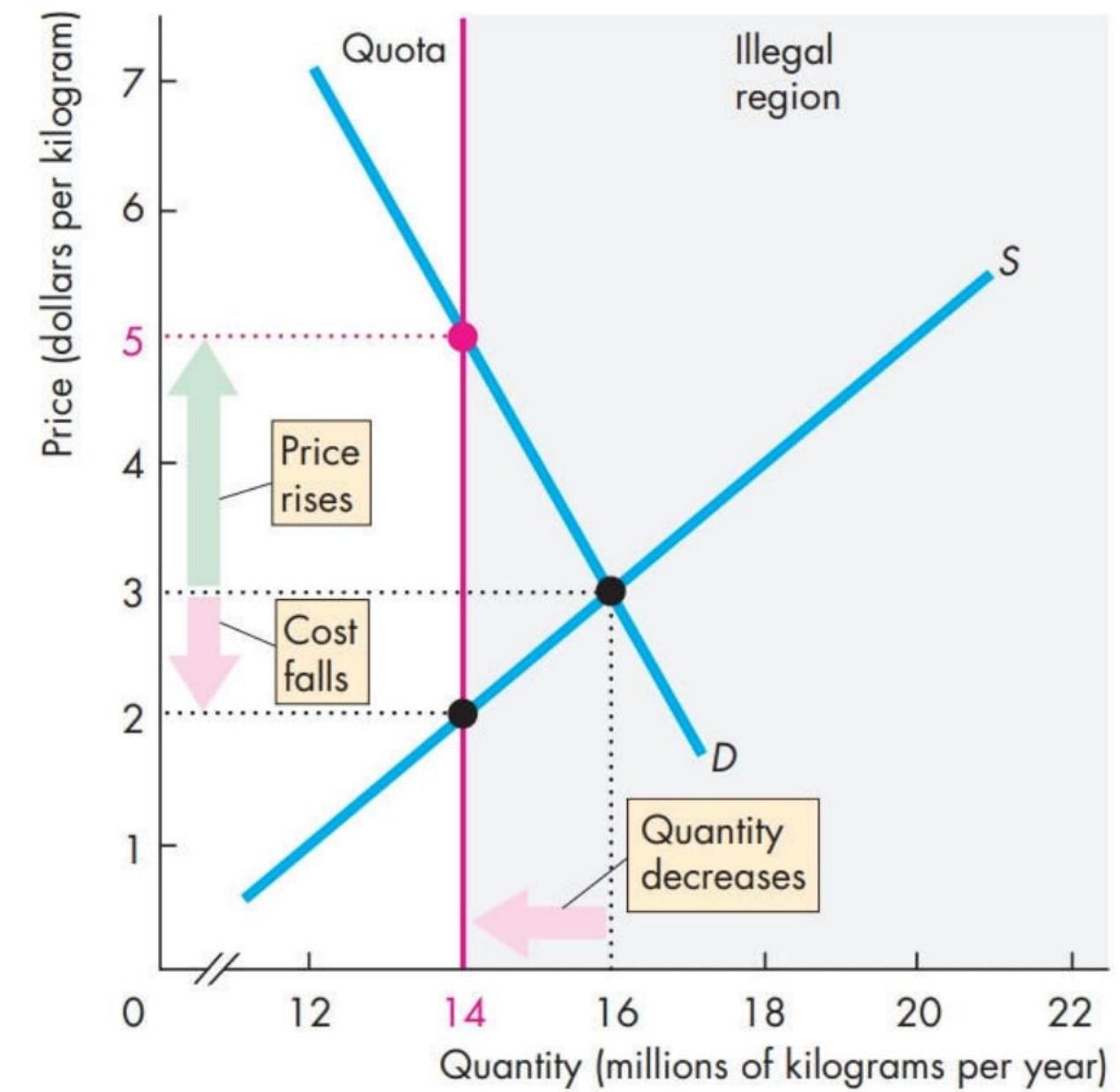
Q19: Why do we add the tax amount to the supply function, but subtract the tax amount from the demand function?

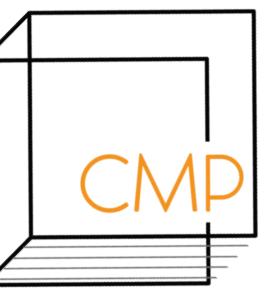




7. Government Actions in Market - Production Quota

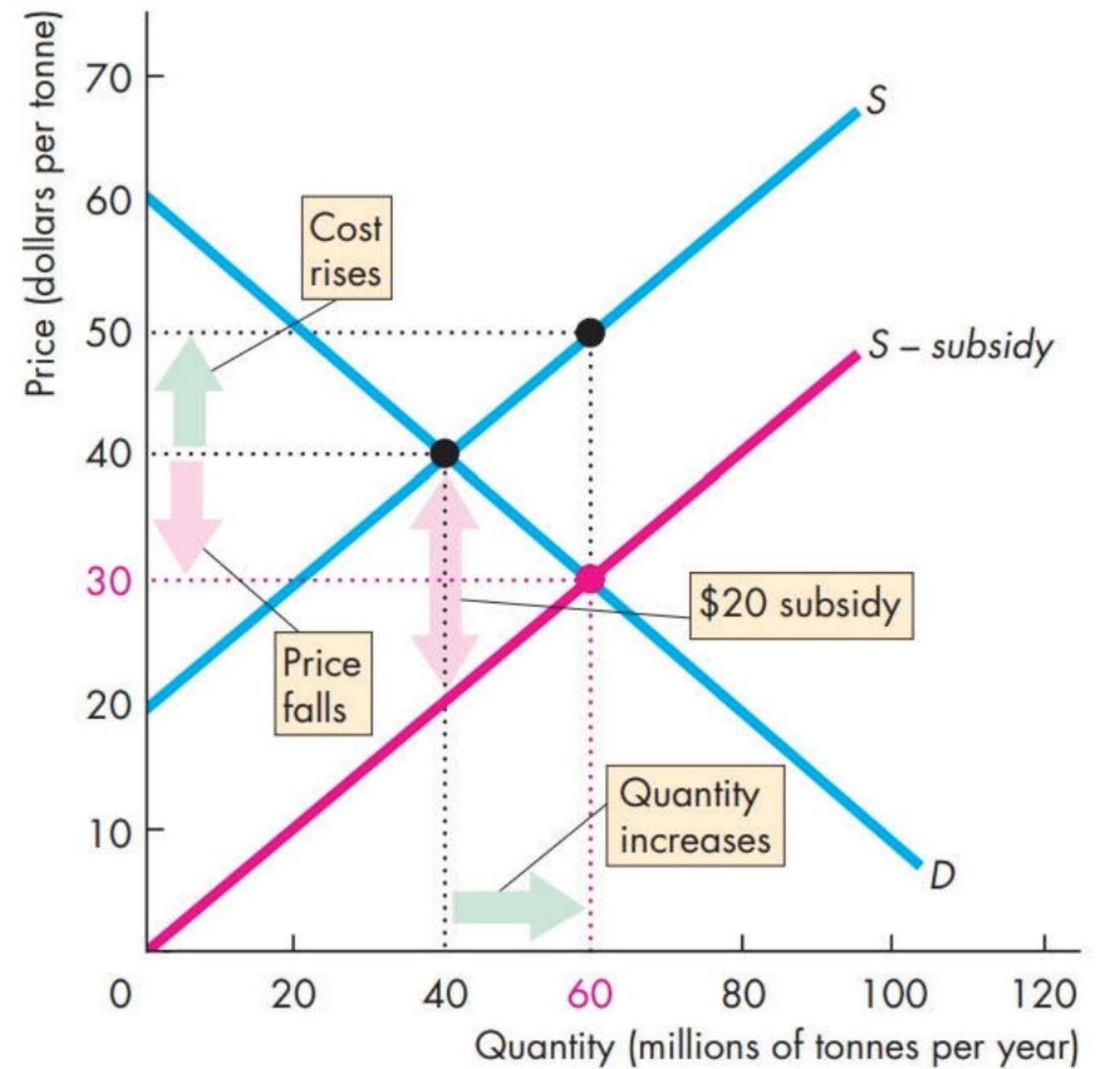
- **production quota:** limits how much can be produced
 - underproduction
 - increases P, decreases Q
 - eg. cigarette market
- effective only when the production quota $< Q^*$

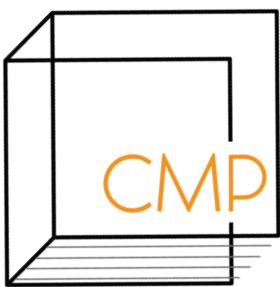




7. Government Actions in Market - Subsidy

- **subsidy:** when the government encourages production by sponsoring the producers
 - decreases P, increases Q
 - overproduction
- costs decrease > supply curve shifts to ***S – subsidy***
 - like a “negative tax”
- producers receive more money than before

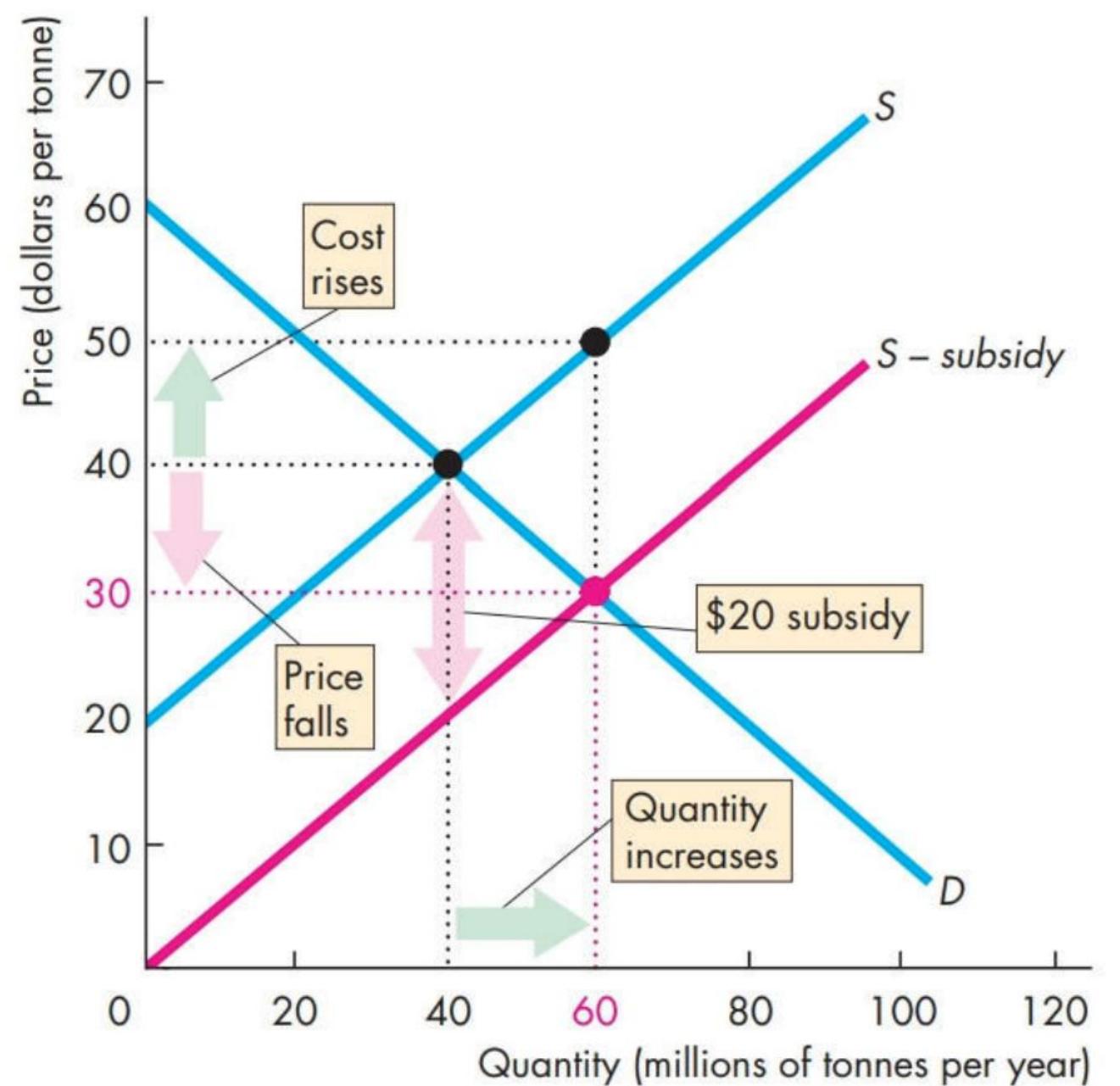


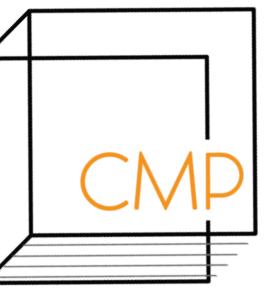


7. Government Actions in Market - Subsidy

Q20: Are producers better off as a result of a subsidy? Why or why not?

(Hint: Compare how much money they receive before and after the subsidy)

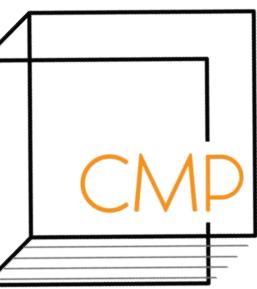




8. Output & Costs

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





8. Output & Costs - SR Product Curves

- since other inputs are fixed in the SR, can only increase labour to increase output

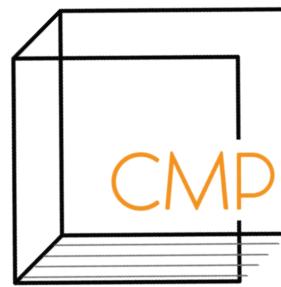
- Product Curves**

- total product (TP)**: how much output is produced in total
- marginal product (MP)**: how much output changes when there's 1 additional unit of labour
- average product (AP)**: $\frac{\text{TP}}{\text{\# units of labour}}$

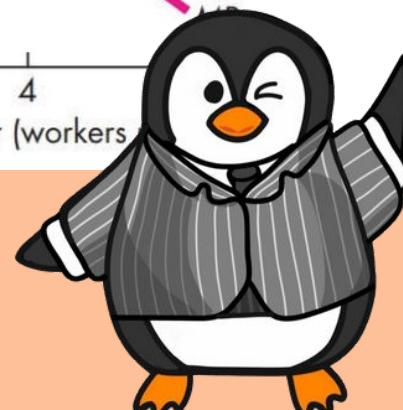
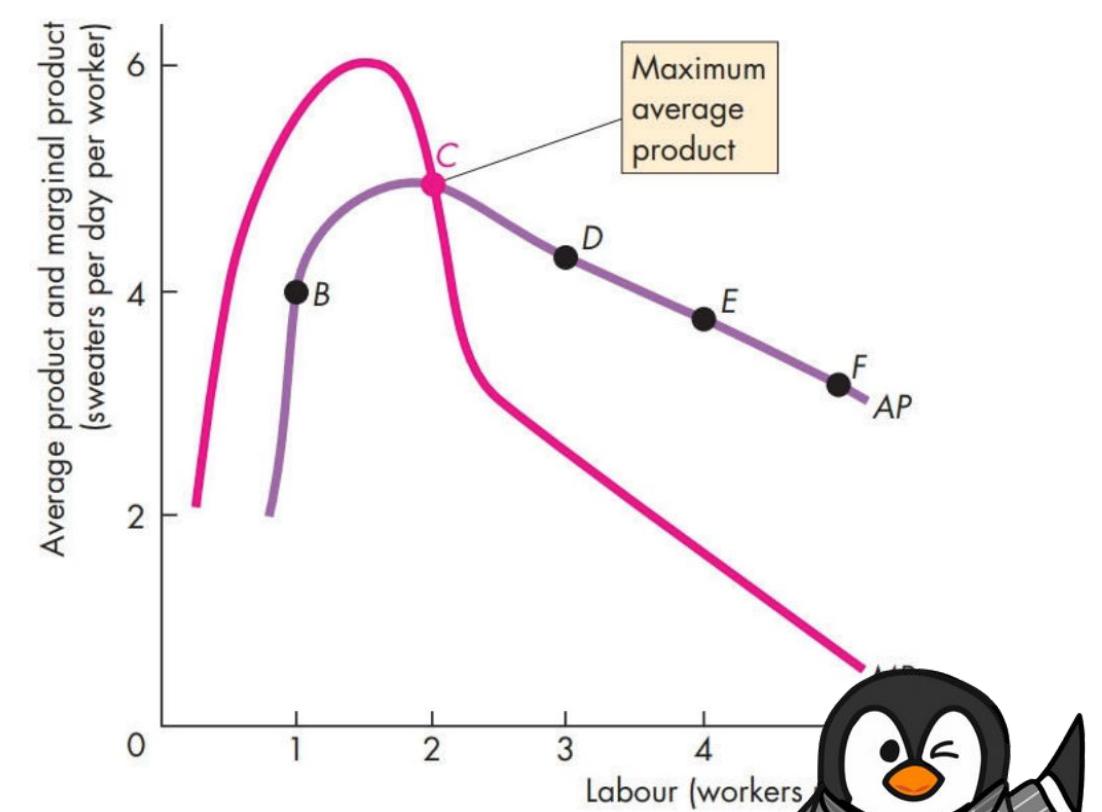
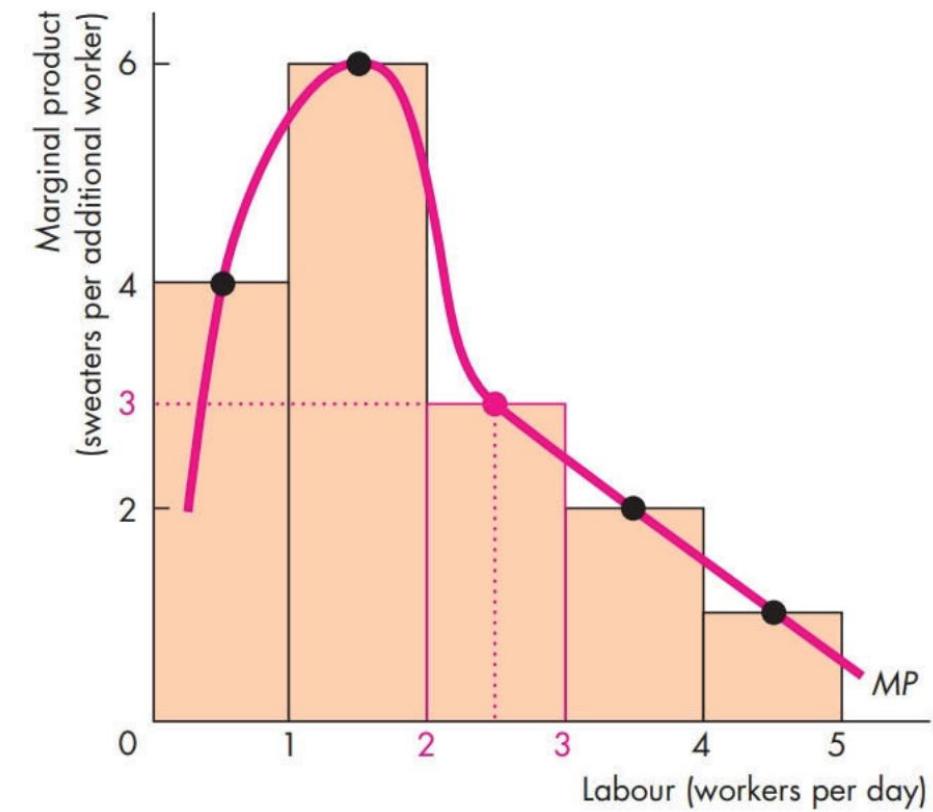
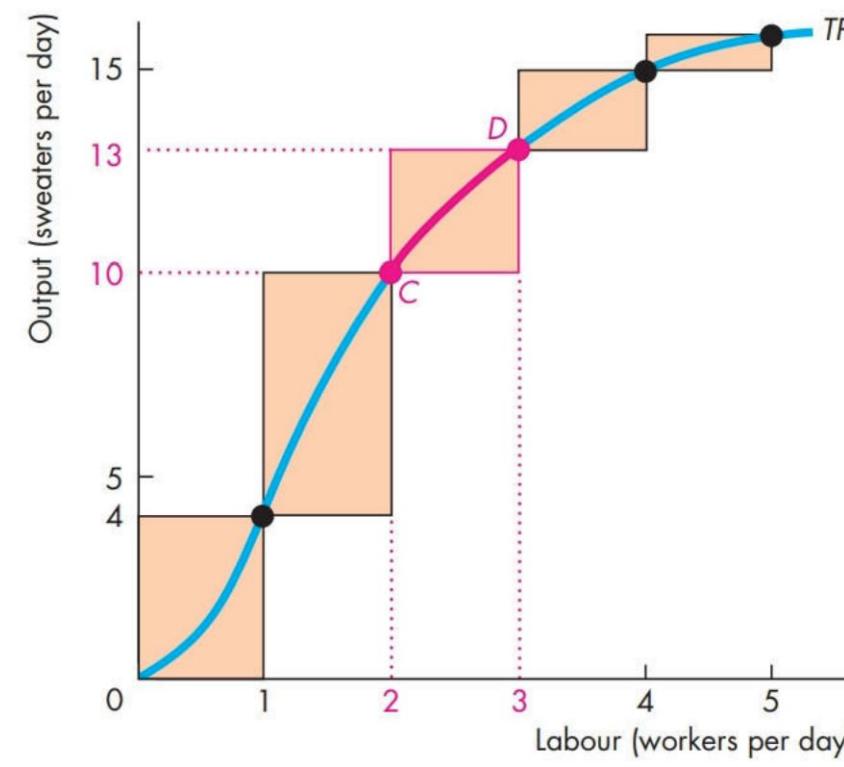
	Labour (workers per day)	Total product (sweaters per day)	Marginal product (sweaters per additional worker)	Average product (sweaters per worker)
A	0	0 4	
B	1	4 6	4.00
C	2	10 3	5.00
D	3	13 2	4.33
E	4	15 1	3.75
F	5	16		3.20

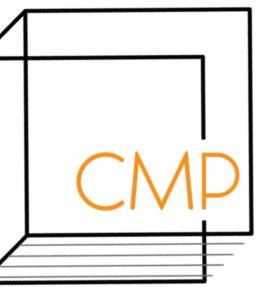


8. Output & Costs - TC, TFC, TVC Curves



TP	MP	AP
<ul style="list-style-type: none"> TP originally increases quickly, but it eventually slows down 	<ul style="list-style-type: none"> 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"> when MP > AP → AP increases when MP < AP → AP decreases when MP = AP → AP is at maximum





8. Output & Costs

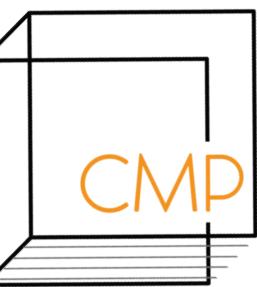
Q21: In the short run, ____ can vary:

- a) number or size of machines
- b) number of factories
- c) number of workers
- d) none of the above

Q22: Decreasing marginal returns occurs at:

- a) output level of zero
- b) high levels of output
- c) low levels of output
- d) when $MP > AP$



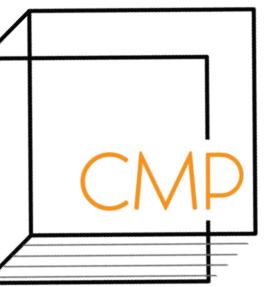


8. Output & Costs - SR Cost Curves

- increasing labour increases costs
- **7 Cost curves**
 - **Total Cost (TC)**: All costs
 - **Total Fixed Cost (TVC)**: cost of fixed inputs, FC is fixed
 - **Total Variable Cost (TVC)**: cost of variable inputs, VC changes when output changes
 - $TC = TFC + TVC$
 - **Average Total Cost (ATC)**: TC / Q
 - **Average Total Fixed Cost (AFC)**: TFC / Q
 - **Average Total Variable Cost (AVC)**: TVC / Q
 - $ATC = AFC + AVC$
 - **Marginal Cost (MC)**: increase in TC when TP increases by 1

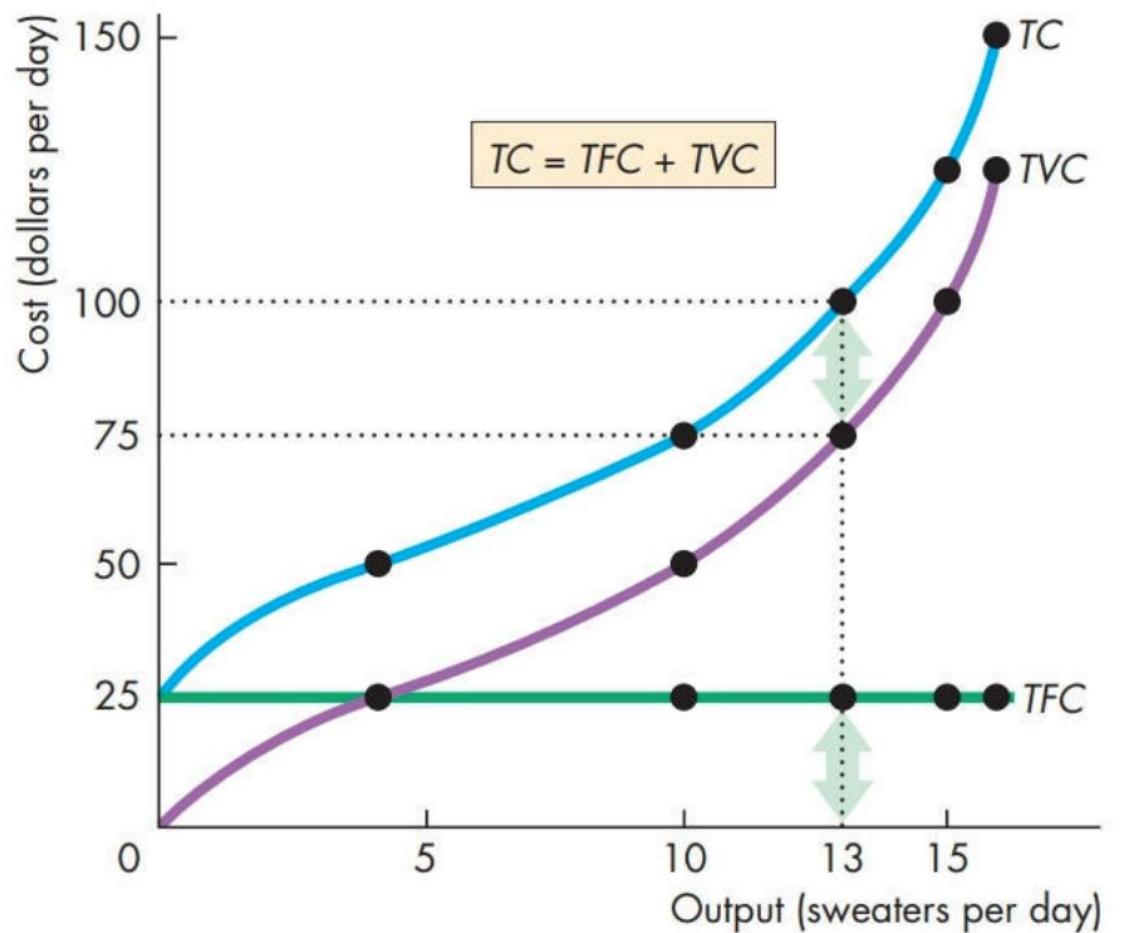
	Labour (workers per day)	Output (sweaters per day)	Total fixed cost (TFC)	Total variable cost (TVC)	Total cost (TC)
	(dollars per day)				
A	0	0	25	0	25
B	1	4	25	25	50
C	2	10	25	50	75
D	3	13	25	75	100
E	4	15	25	100	125
F	5	16	25	125	150

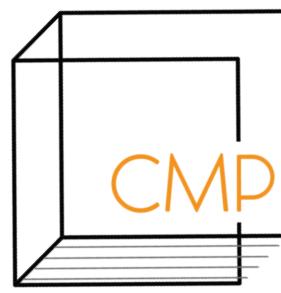




8. Output & Costs - TC, TFC, TVC Curves

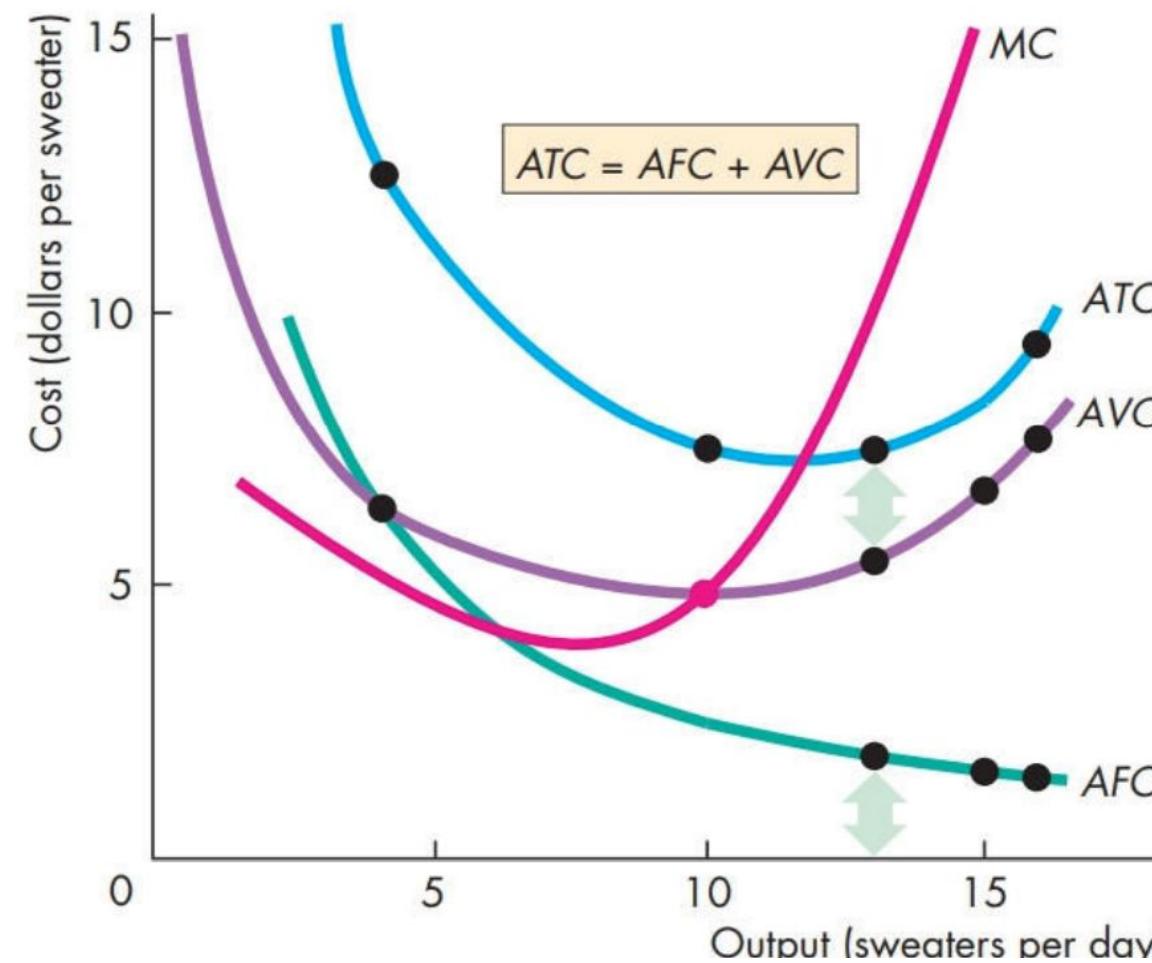
TFC	TVC	TC
<ul style="list-style-type: none"> horizontal, straight line constant because fixed input is fixed 	<ul style="list-style-type: none"> at low levels of output, TVC is flat because MC are decreasing at high levels of output, TVC is steep because MC are increasing 	<ul style="list-style-type: none"> simply a TVC curve that's shifted up the distance between TC and TVC is TFV





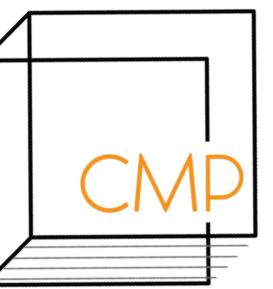
8. Output & Costs - ATC, AFC, AVC, MC Curves

AFC	AVC	ATC	MC
<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, and it 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 \rightarrow AVC/ATC is decreasing
- MC is above AVC/ATC \rightarrow AVC/ATC is increasing
- MC = AVC/ATC \rightarrow AVC/ATC is at minimum





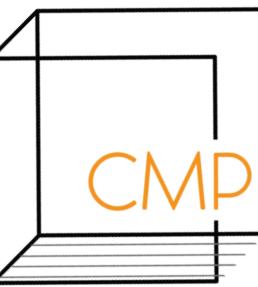
8. Output & Costs - Cost Curves

Q23: When $MC = AVC$,

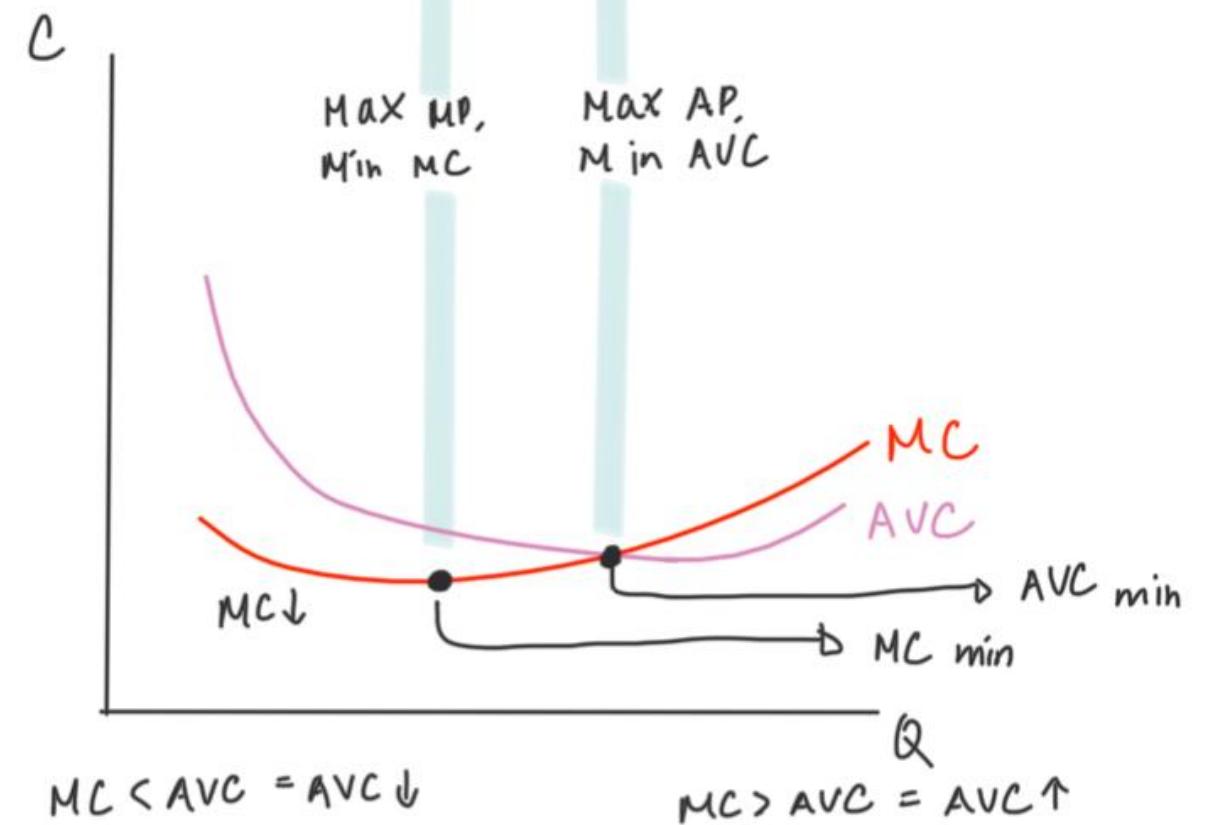
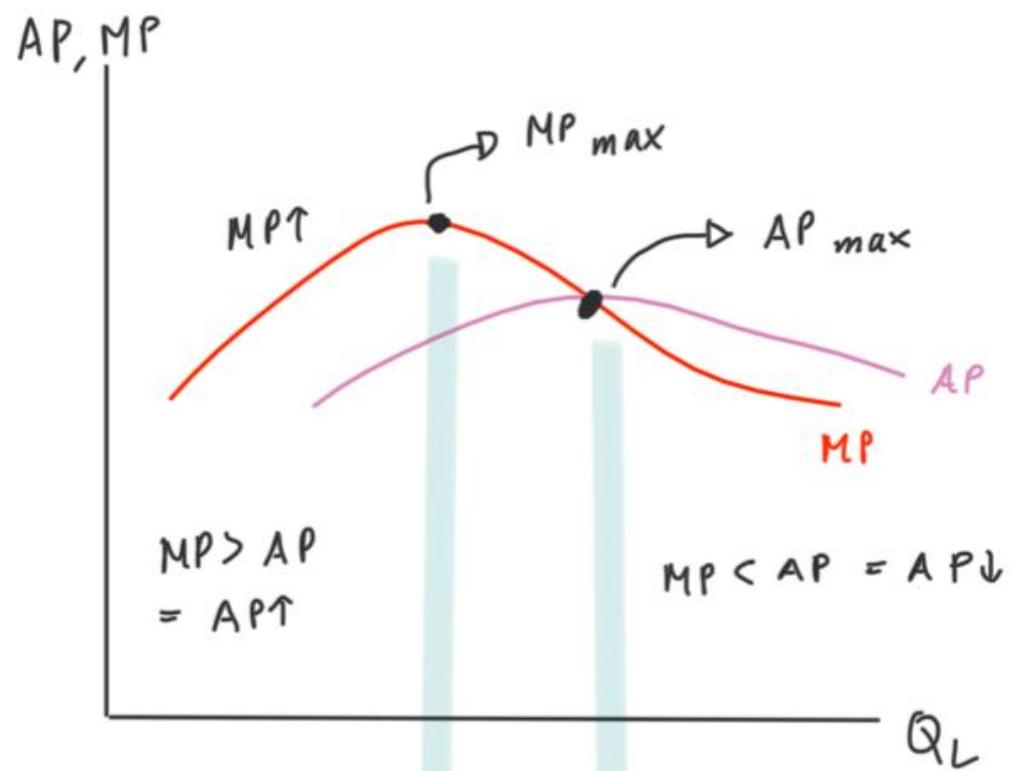
- a) AVC is at maximum
- b) AVC is at minimum
- c) ATC is at maximum
- d) ATC is at minimum



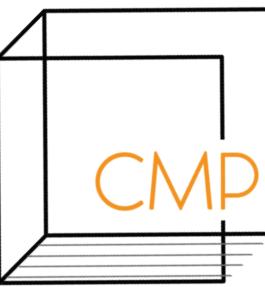
8. Output & Costs - MP/AP vs. MC/AC Curves



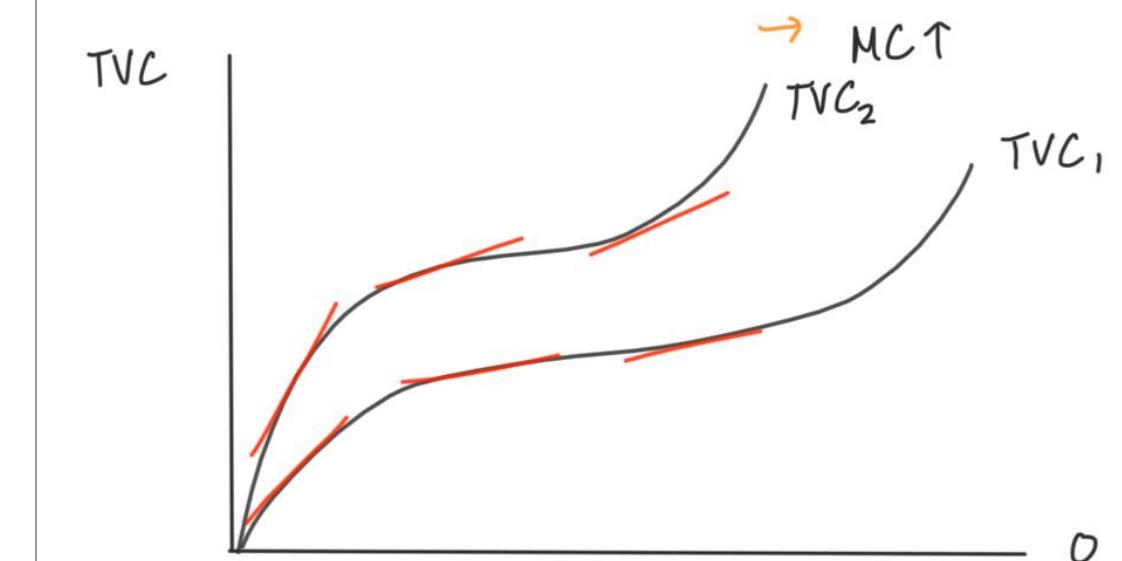
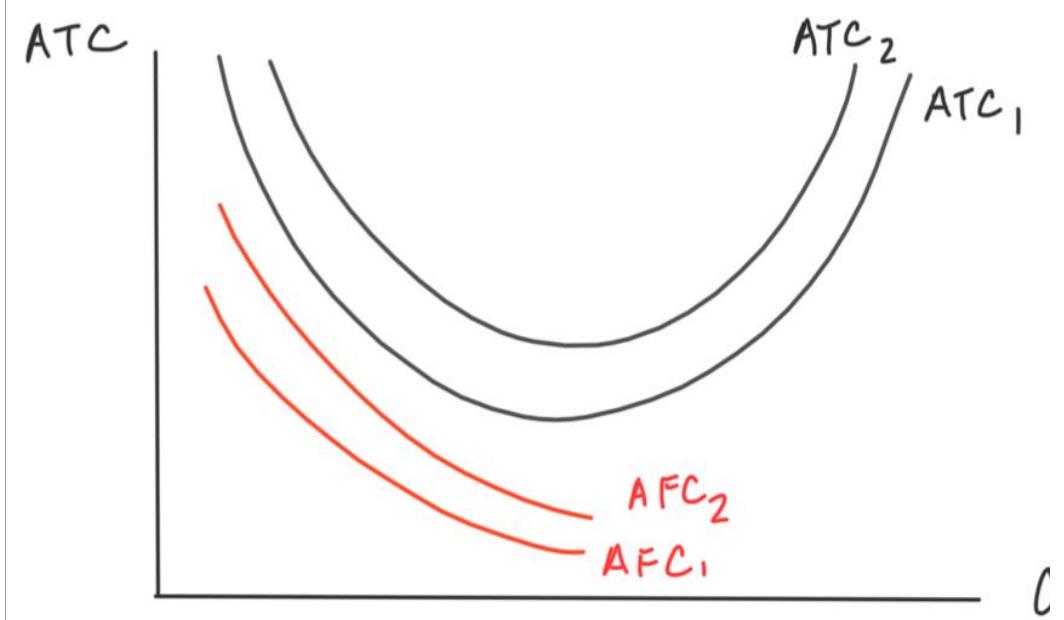
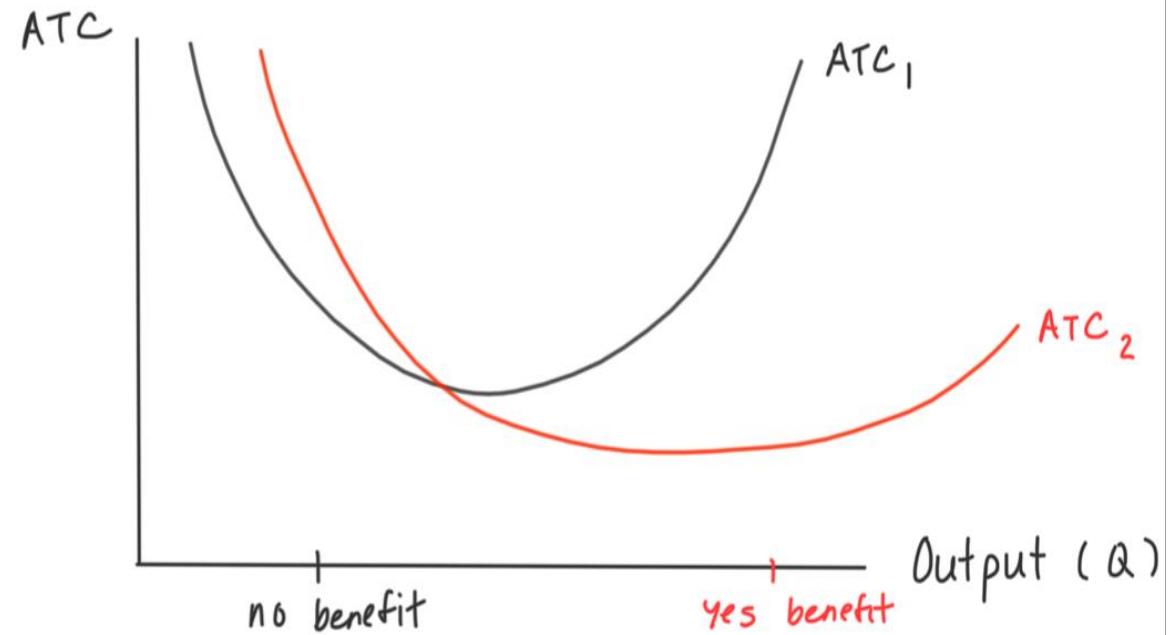
- MP is at max \rightarrow MC is at min
- AP is at max \rightarrow AVC is at min

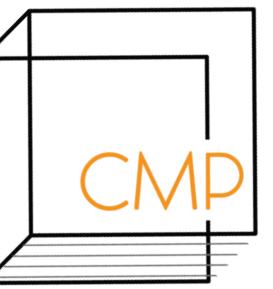


8. Output & Costs - Shifts in Cost Curves



Technological Advances	Price of Fixed Factors	Price of Variable Factors
<ul style="list-style-type: none"> capital cost rises $>$ AFC rises but AVC drops at low level of output, ATC is high at high level of output, ATC is low 	<ul style="list-style-type: none"> price of fixed factors rises $>$ TFC rises $>$ AFC rises $>$ ATC rises TVC, AVC, MC = same 	<ul style="list-style-type: none"> price of variable factors rises $>$ TVC rises $>$ AVC rises $>$ ATC rises steeper tangents means higher MC





8. Output & Costs - Cost Curves

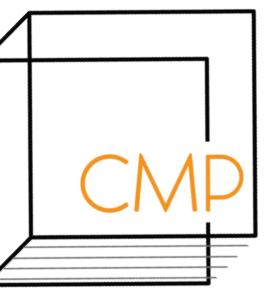
Q24: When MP is rising,

- a) AP is at maximum
- b) $MP < AP$
- c) MC is decreasing
- d) AVC is rising

Q25: When a technology change that improves productivity occurs, which is FALSE?

- a) AFC increases but AVC decreases
- b) capital costs rises
- c) It's more beneficial to produce high output levels because ATC is lower there
- d) It's more beneficial to produce low output levels because ATC is lower there





8. Output & Costs - LR

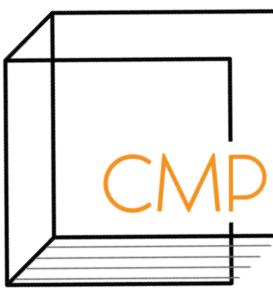
- all inputs and all costs are variable
- **marginal product of capital:** the increase in output when capital increases by 1 unit (labour constant)
 - **Diminishing marginal returns to capital:** MP increases quickly at first, but it eventually slows down as we keep increasing the plant size
- each plant has their own cost curve

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

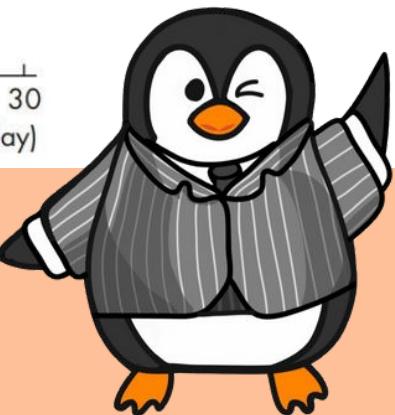
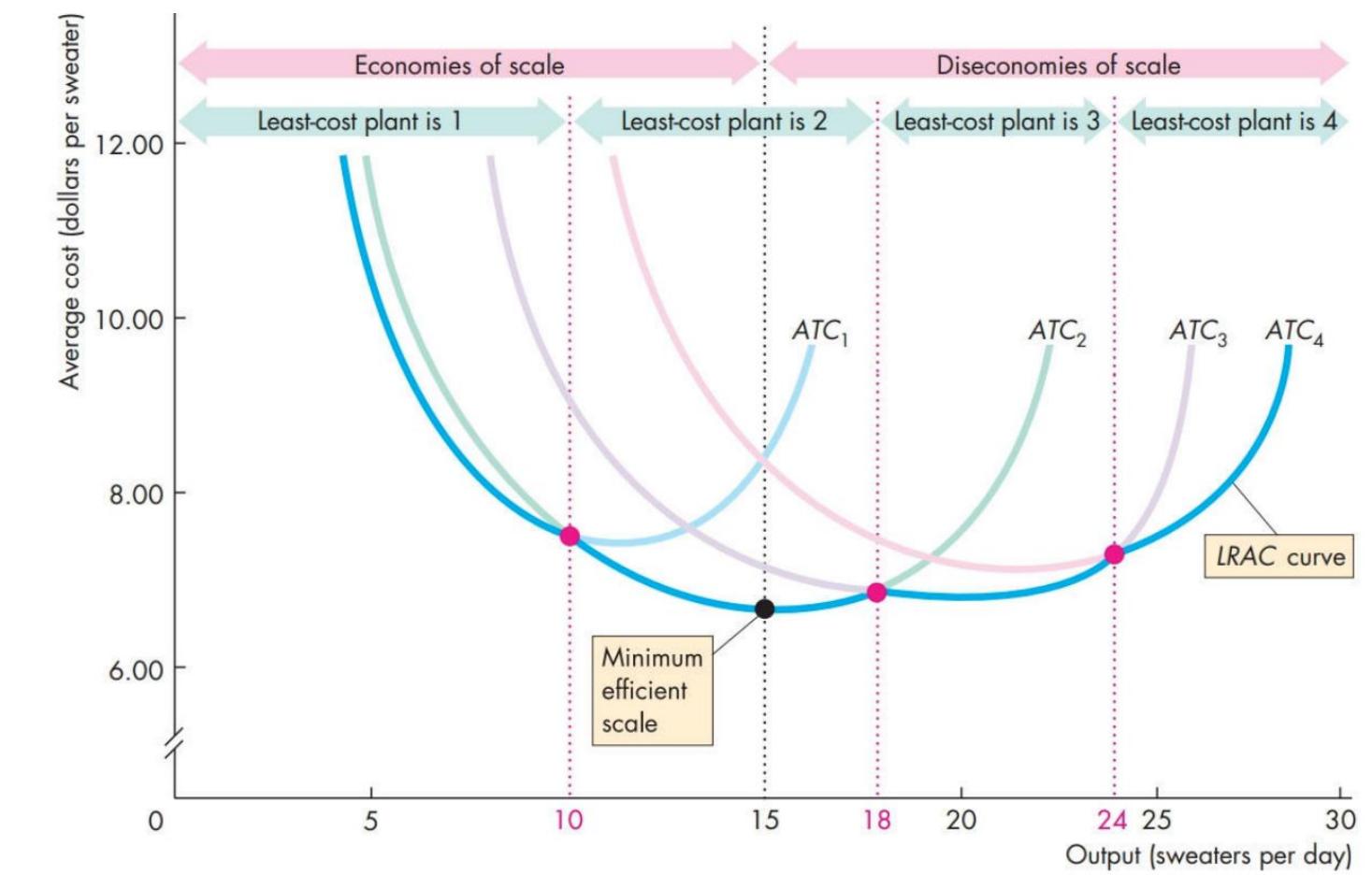
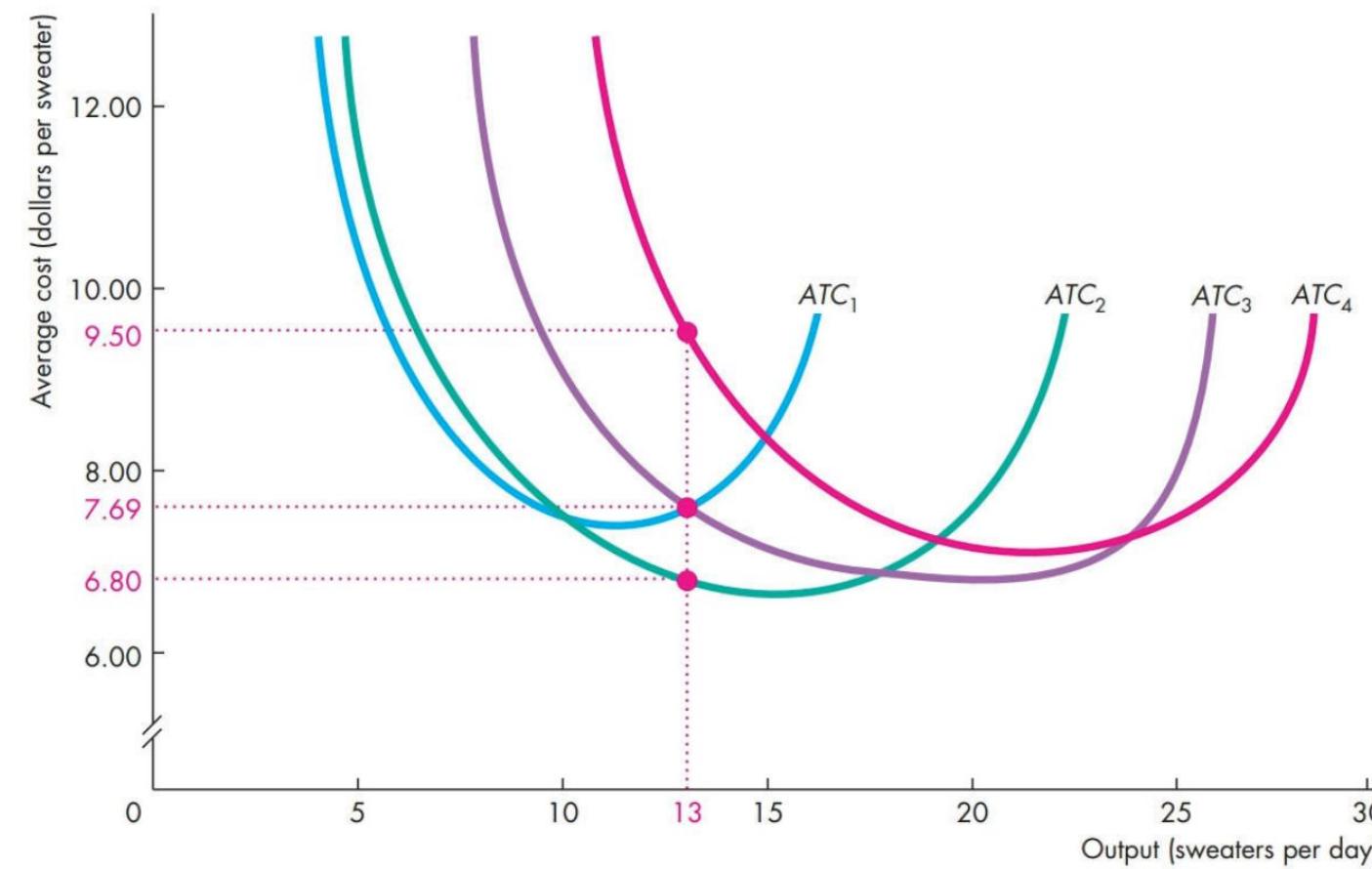
A red circle highlights the value '3' in the 'Plant 2' column under 'Labor'. A red arrow points from the bottom right towards the 'Plant 2' column. A blue arrow points downwards from the 'Plant 2' column towards the 'Knitting machines' row.

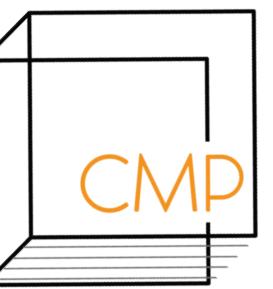




8. Output & Costs - LRAC

- **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





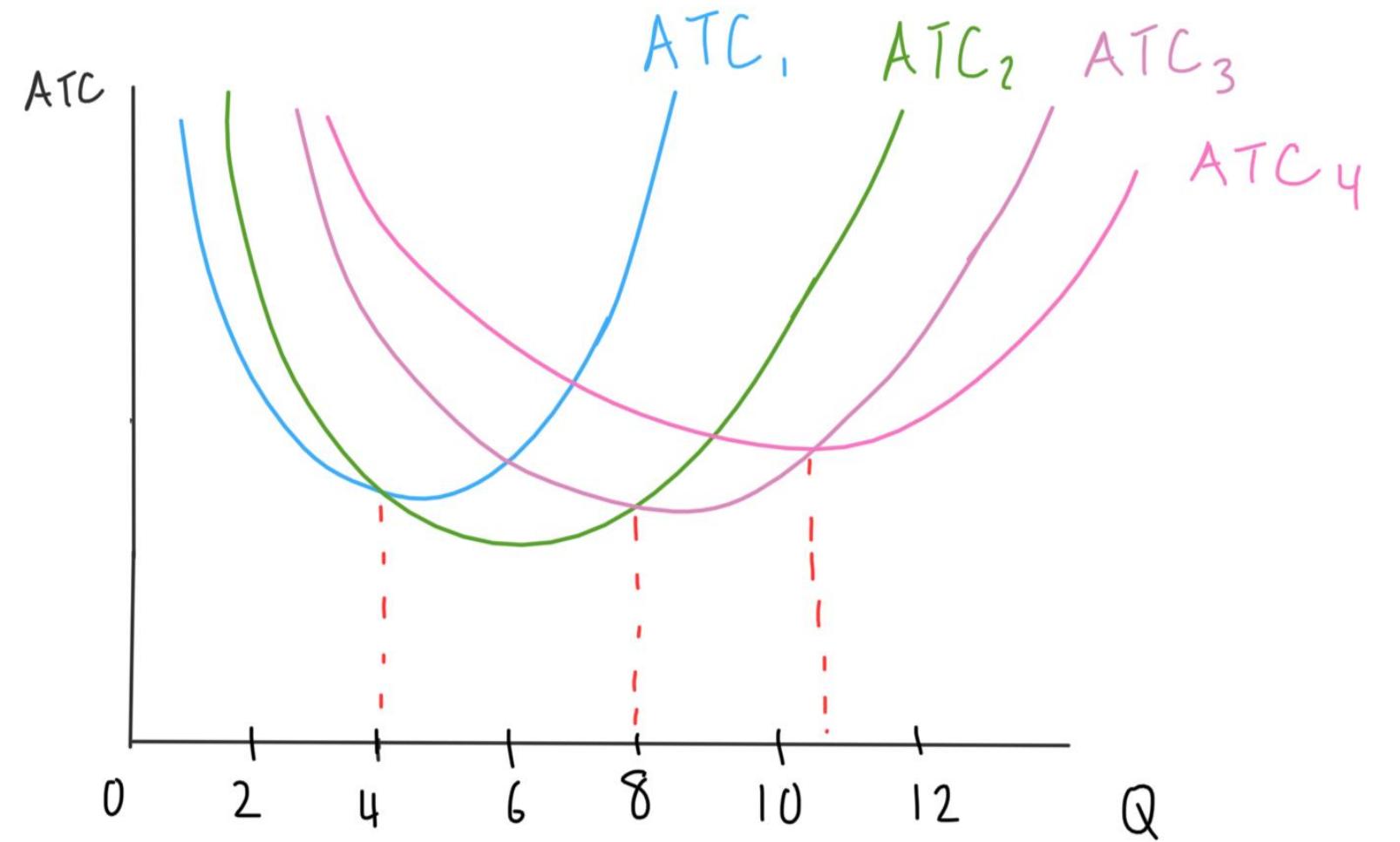
8. Output & Costs - Cost Curves

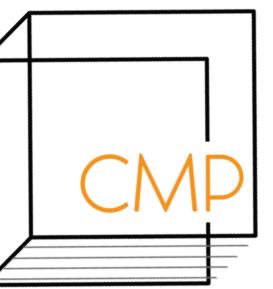
Q26: At an output level of 10 units, which plant would achieve the lowest ATC?

- a) Plant 1
- b) Plant 2
- c) Plant 3
- d) Plant 4

Q27: At the output level of 6, there is,

- a) economies of scale
- b) diseconomies of scale
- c) constant economies of scale
- d) minimum efficient scale

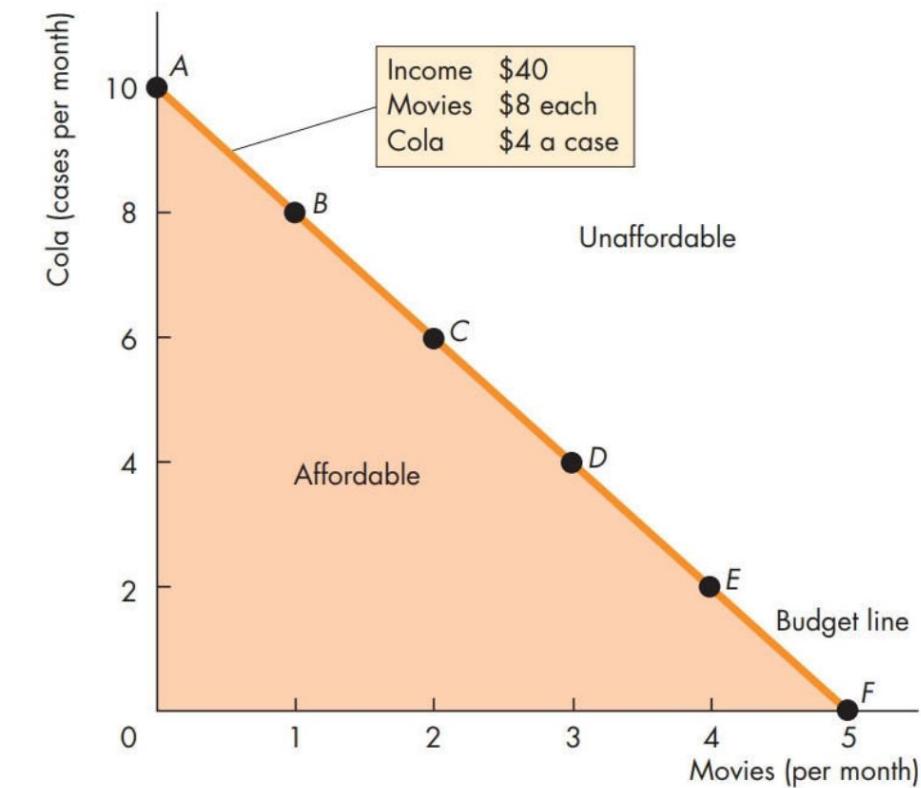




9. Utility & Demand - Consumption Possibilities

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

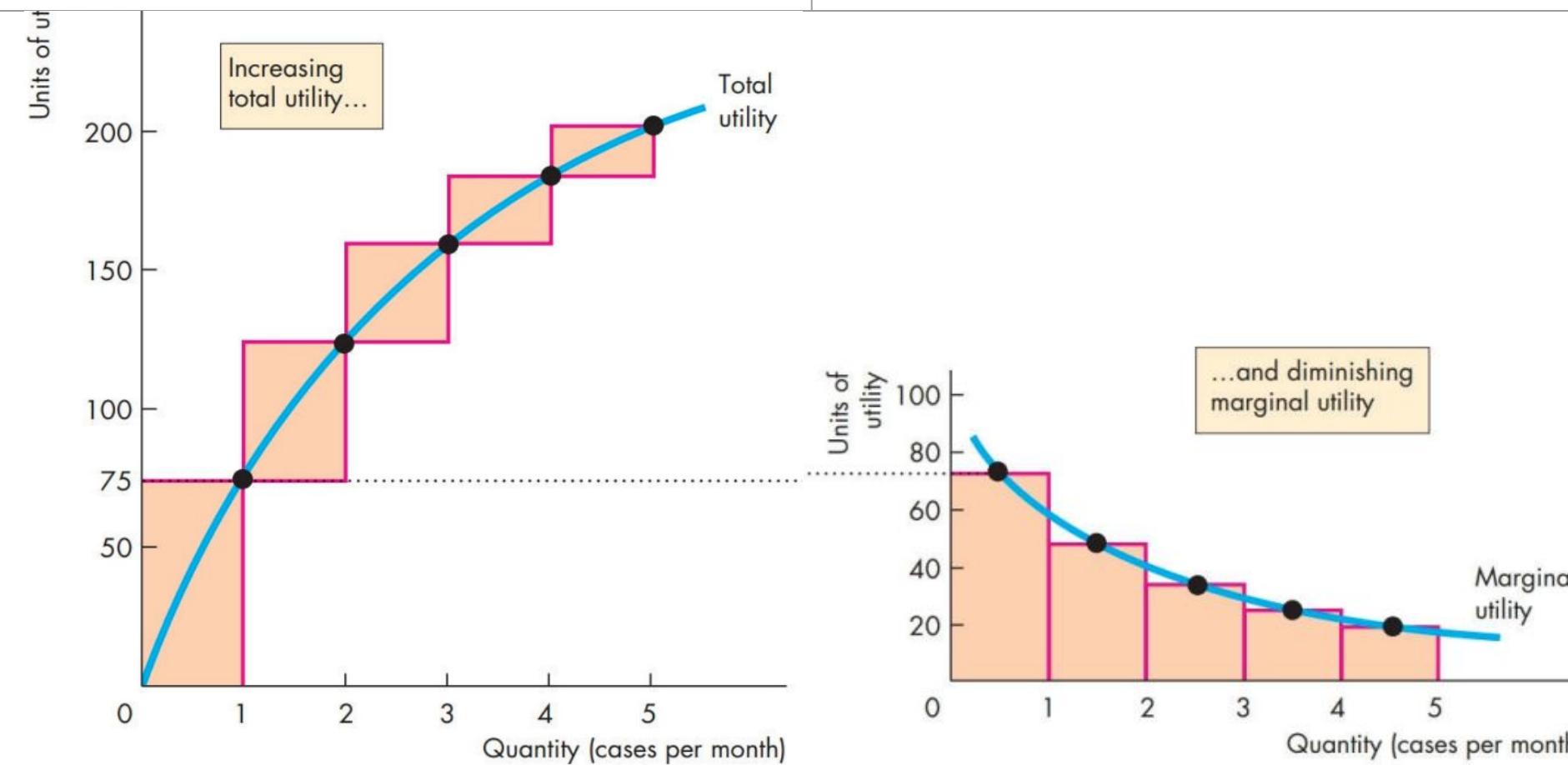
Possibility	Quantity	Movies		Cola	
		Expenditure (dollars)	Cases	Expenditure (dollars)	Cases
A	0	0	10	40	
B	1	8	8	32	
C	2	16	6	24	
D	3	24	4	16	
E	4	32	2	8	
F	5	40	0	0	

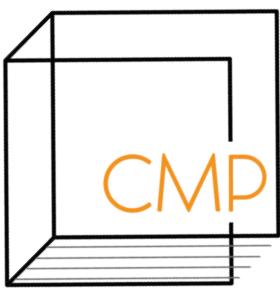


9. Utility & Demand - Utility

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

Total Utility (TU)	Marginal Utility (MU)
<ul style="list-style-type: none"> ● increases as consumption increases ● at levels of consumption, TU increases by less each time 	<ul style="list-style-type: none"> ● how much TU changes when 1 more unit of a good is consumed ● diminishing marginal utility: MU decreases as consumption increases

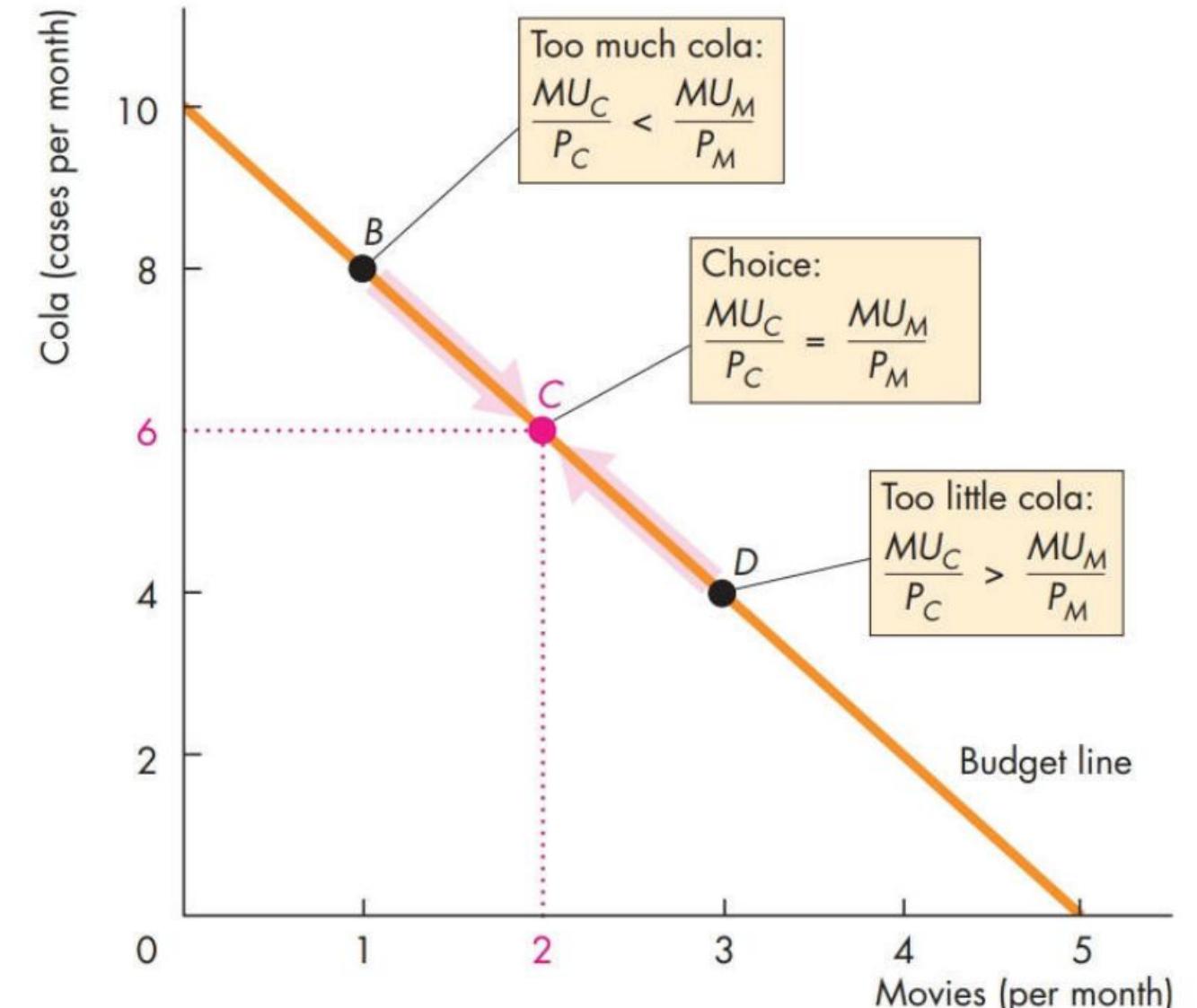


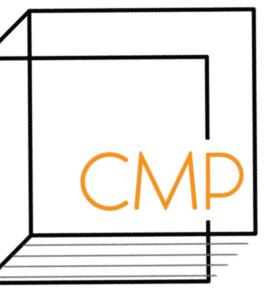


9. Utility & Demand - Utility-Maximizing Choice

Steps:

1. Find the Just-Affordable Combinations (shown by the consumer's budget line)
2. Find the TU for each Just-Affordable Combination
3. Find the consumer EQM
 - **consumer EQM:** when the consumer allocated their income in a way that maximizes their total utility
 - **marginal utility per dollar:** how much TU increases 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
 - $\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$



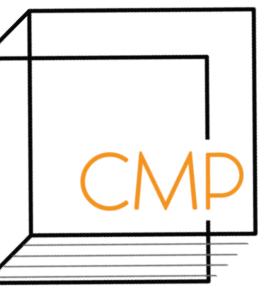


9. Utility & Demand - Utility-Maximizing Choice

Q28: Given the table, fill in the column, MUy/\$. Which combination of bubble tea and yogurt maximizes utility and how do you know?

	Bubble Tea (\$10)			Yoghurt (\$4)		
	Q _b	MU _b	MU _b /\\$	Q _y	MU _y	MU _y /\\$
A	1	70	7	6	2	
B	2	40	4	5	6	
C	3	20	2	4	8	





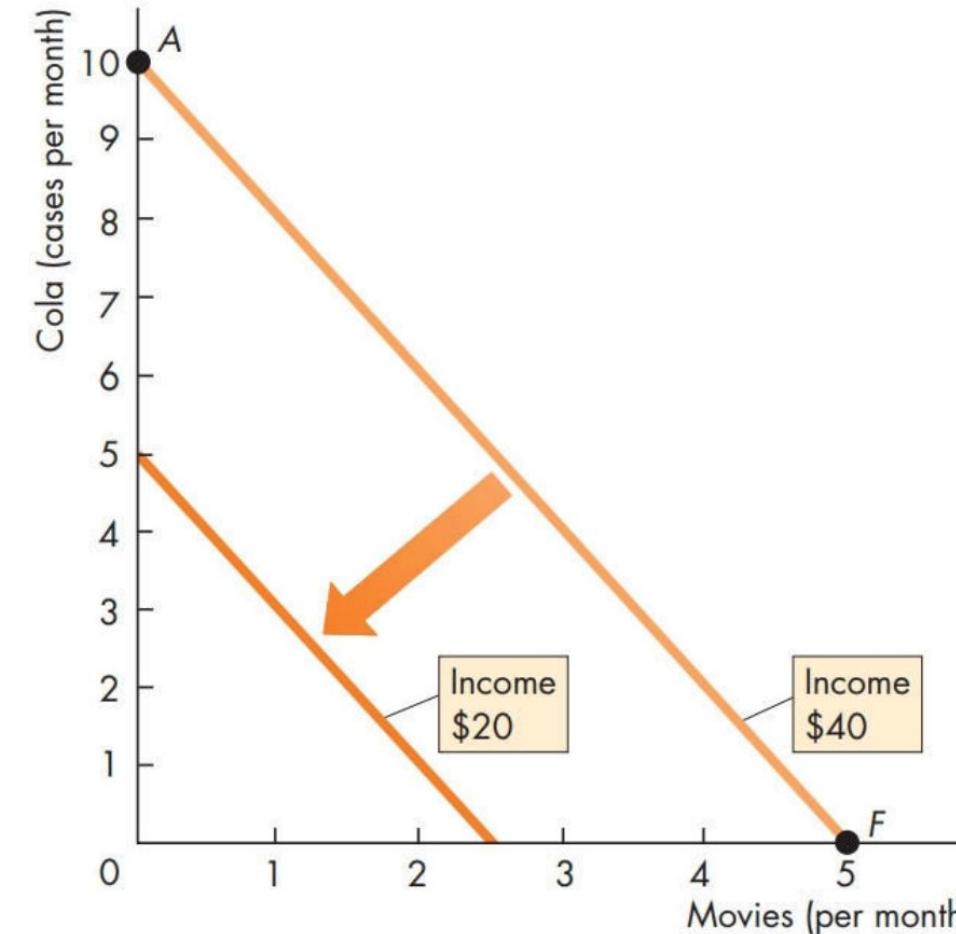
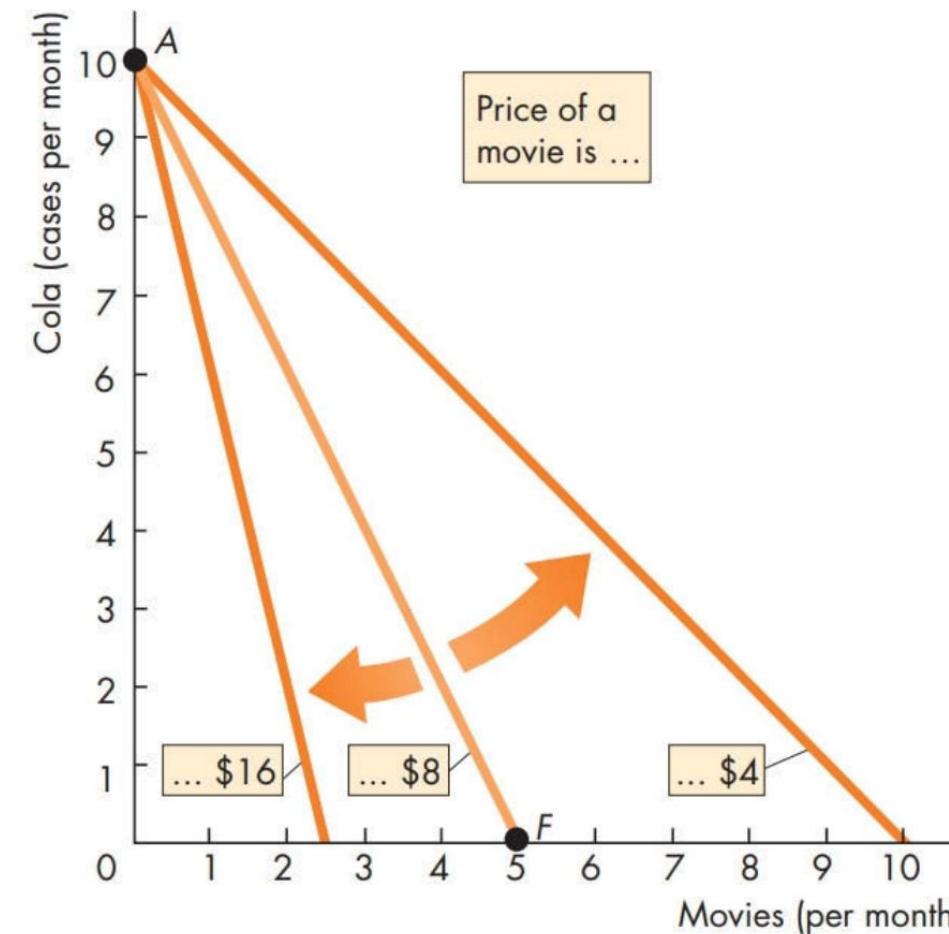
9. Utility & Demand - Real Income, Relative Price

- **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

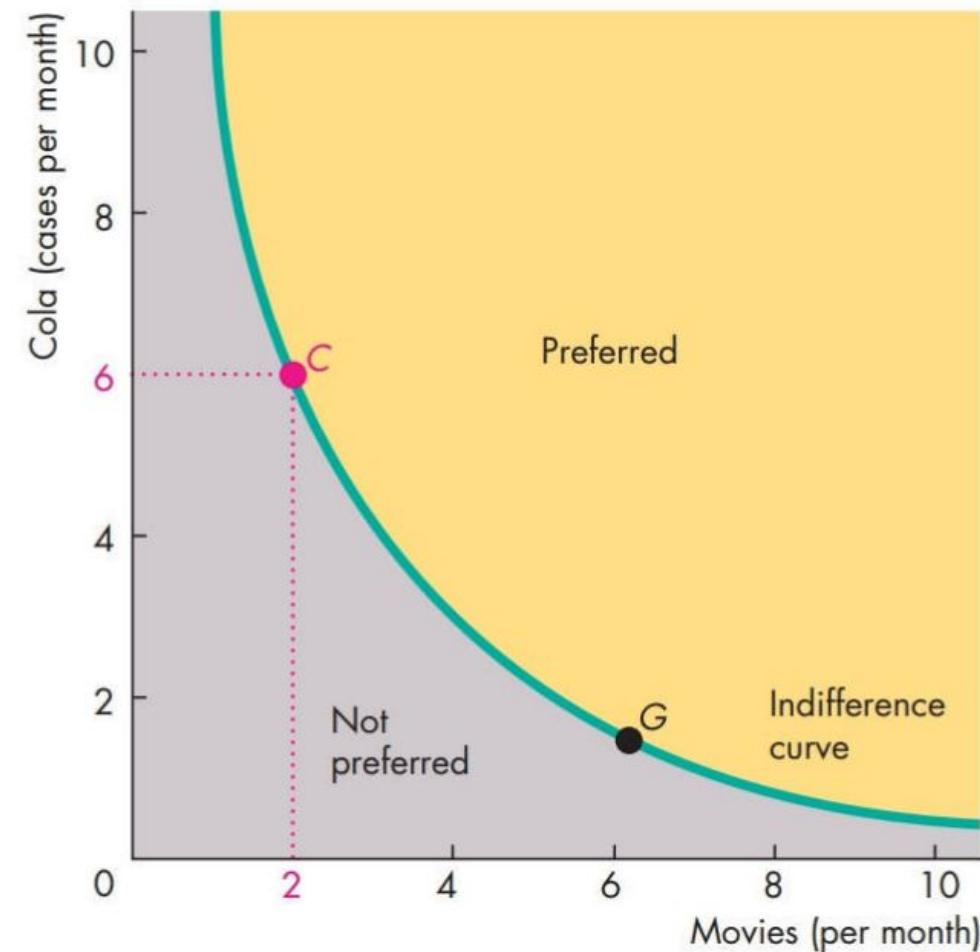
Changes in Prices	Changes in Income
<ul style="list-style-type: none"> Price changes > relative price changes > slope changes Price of the good on the x-axis drops → budget line flattens Price of the good on the x-axis rises → budget line gets steeper 	<ul style="list-style-type: none"> Income changes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



9. Utility & Demand - Preferences and Indifference Curves

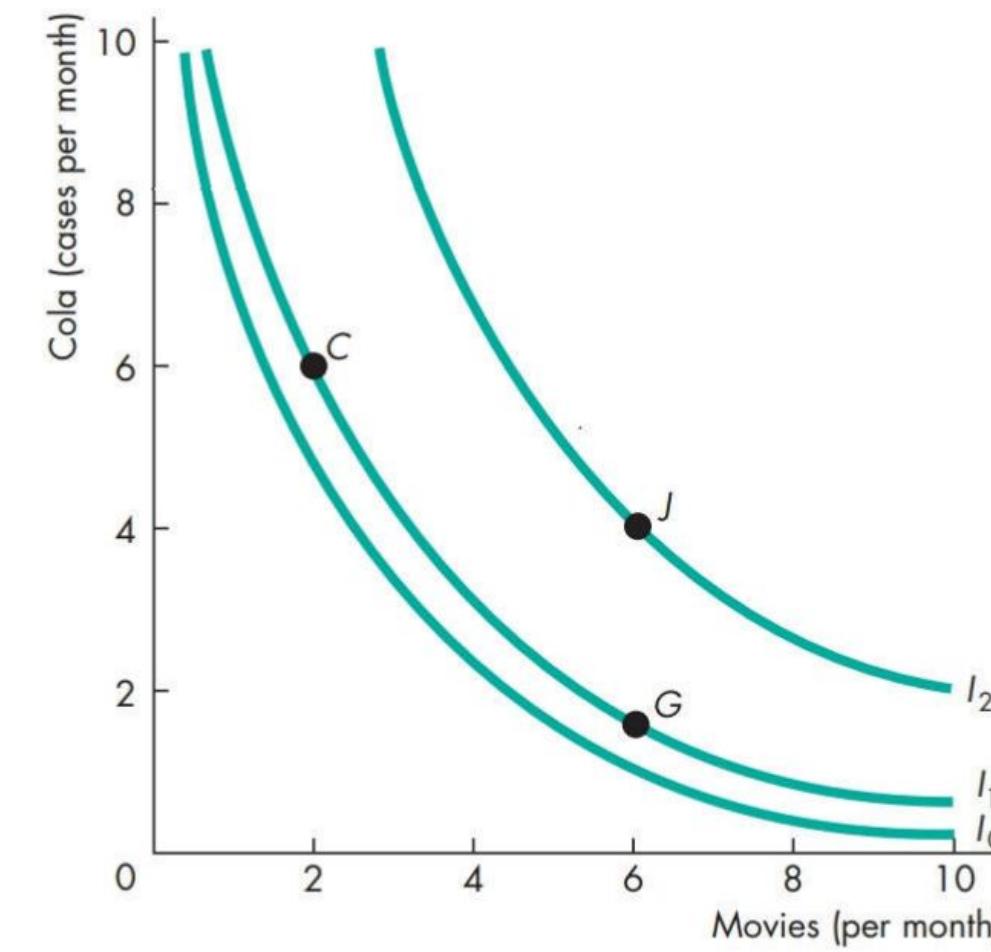
Indifference Curve

- shows the combos of goods where the consumer is indifferent
- order of preference: below indifference curve, indifference curve, above indifference curve



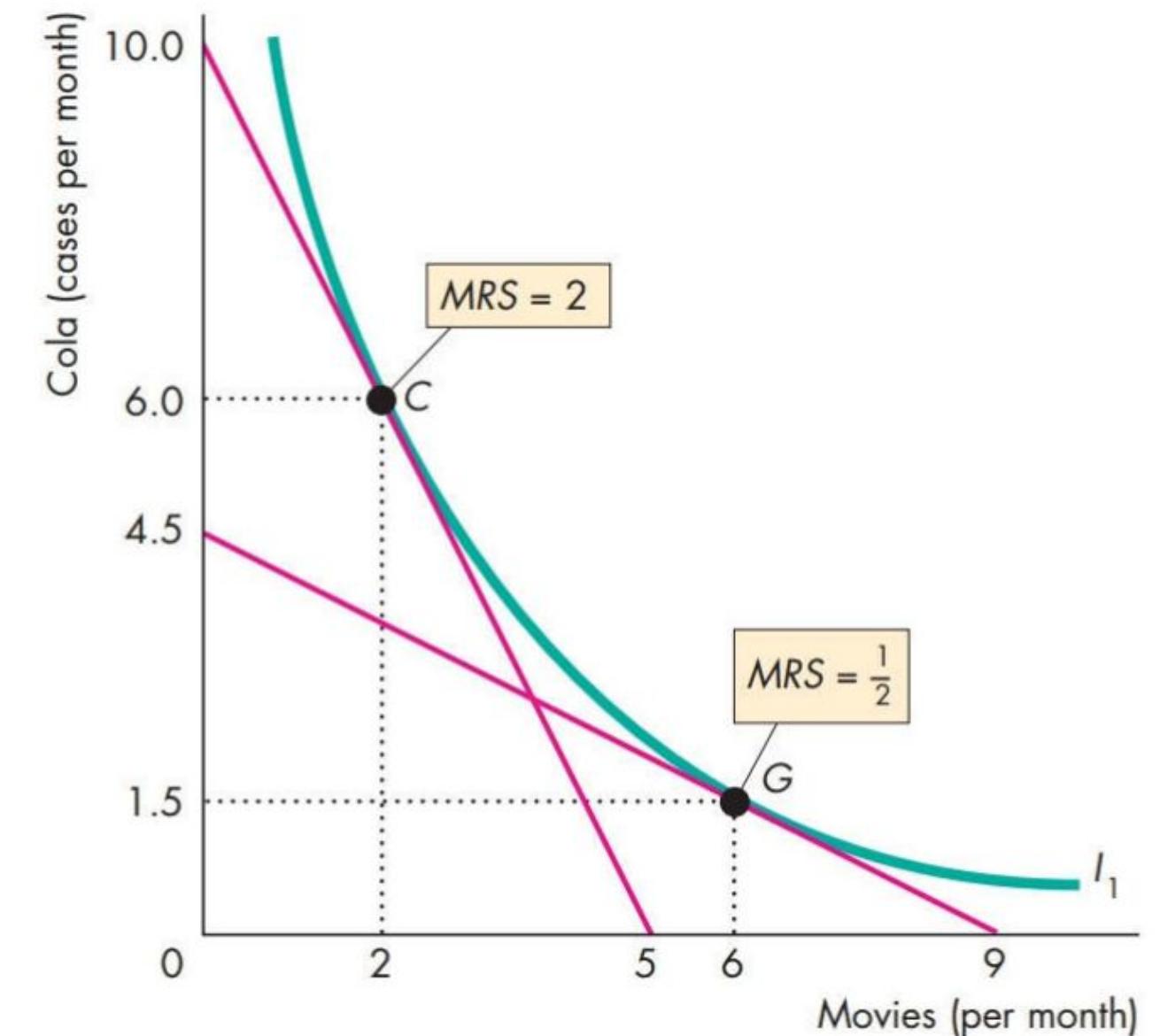
Preference Map

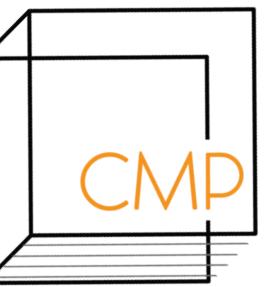
- shows multiple indifference curves
- farther the budget line is from the origin, the more the consumer prefers it



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 - Changes to the Budget Line

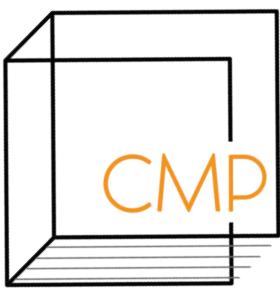
Q29: Consider a graph with budget line where the quantity of bubble tea is on the y-axis and the quantity of yoghurt is on the x-axis. If the consumer's income decreased, the budget line ('s) _____ would _____.

- a. N/A, shift to the right
- b. N/A, shift to the left
- c. slope, flatten
- d. slope, become steeper

Q30: Where on the indifference curve would you expect a high MRS?

- a. when the quantity of the good on the y-axis is 0
- b. In the middle of the indifference curve
- c. on the steeper side of indifference curve
- d. when the quantity of the good on the x-axis is very high

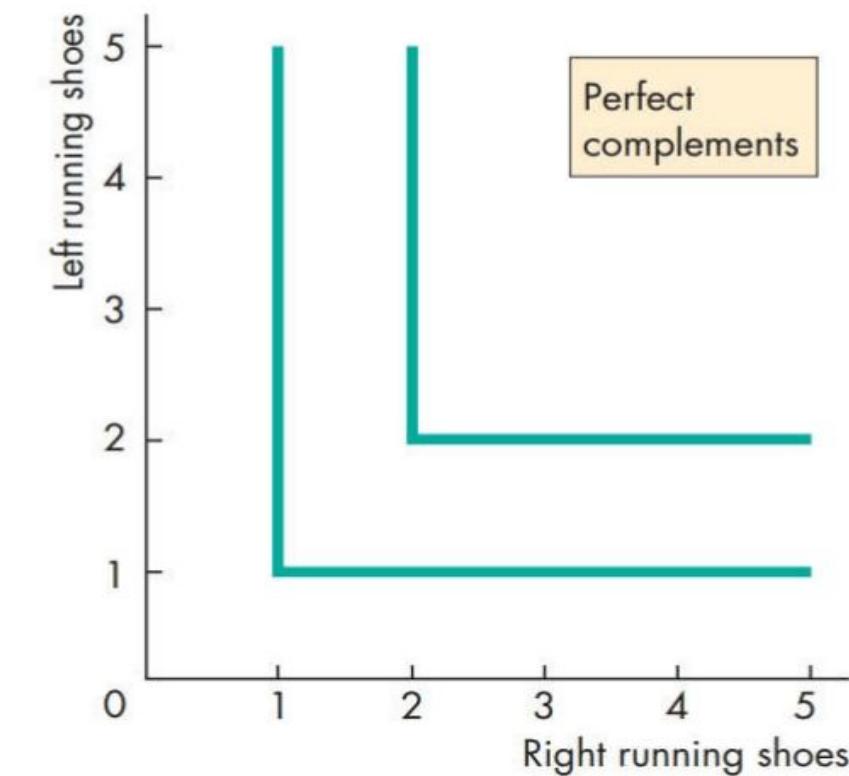
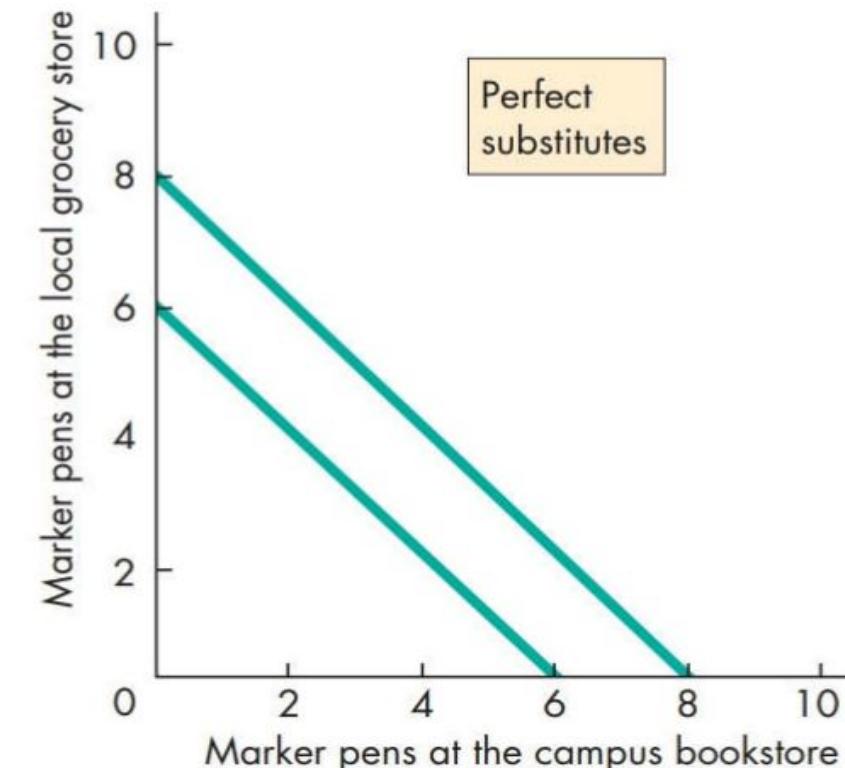
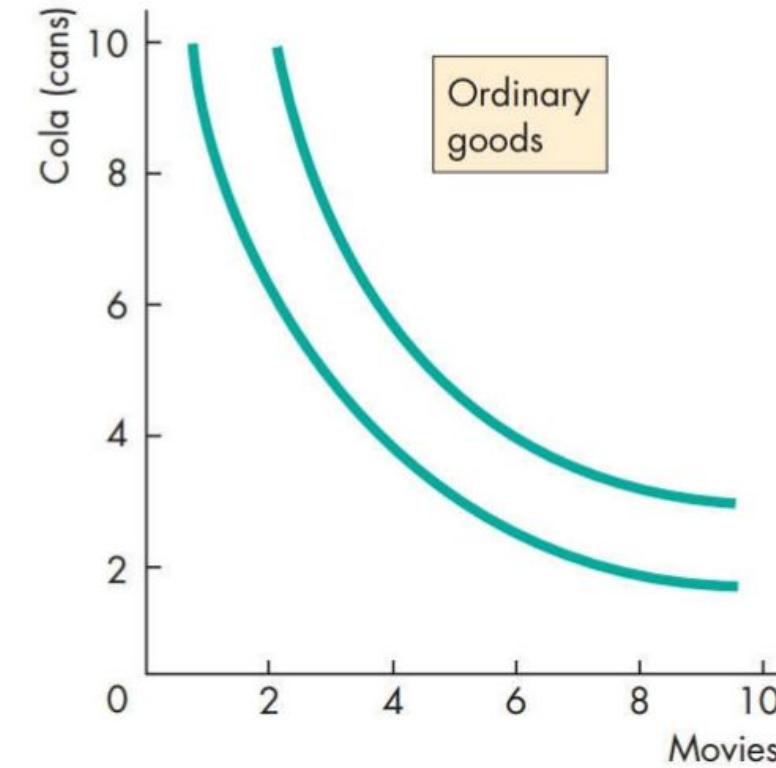


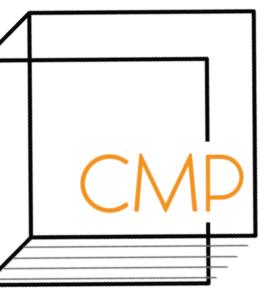


9. Utility & Demand - Degree of Substitutability

- **degree of substitutability:** affects the shape of the indifference curve

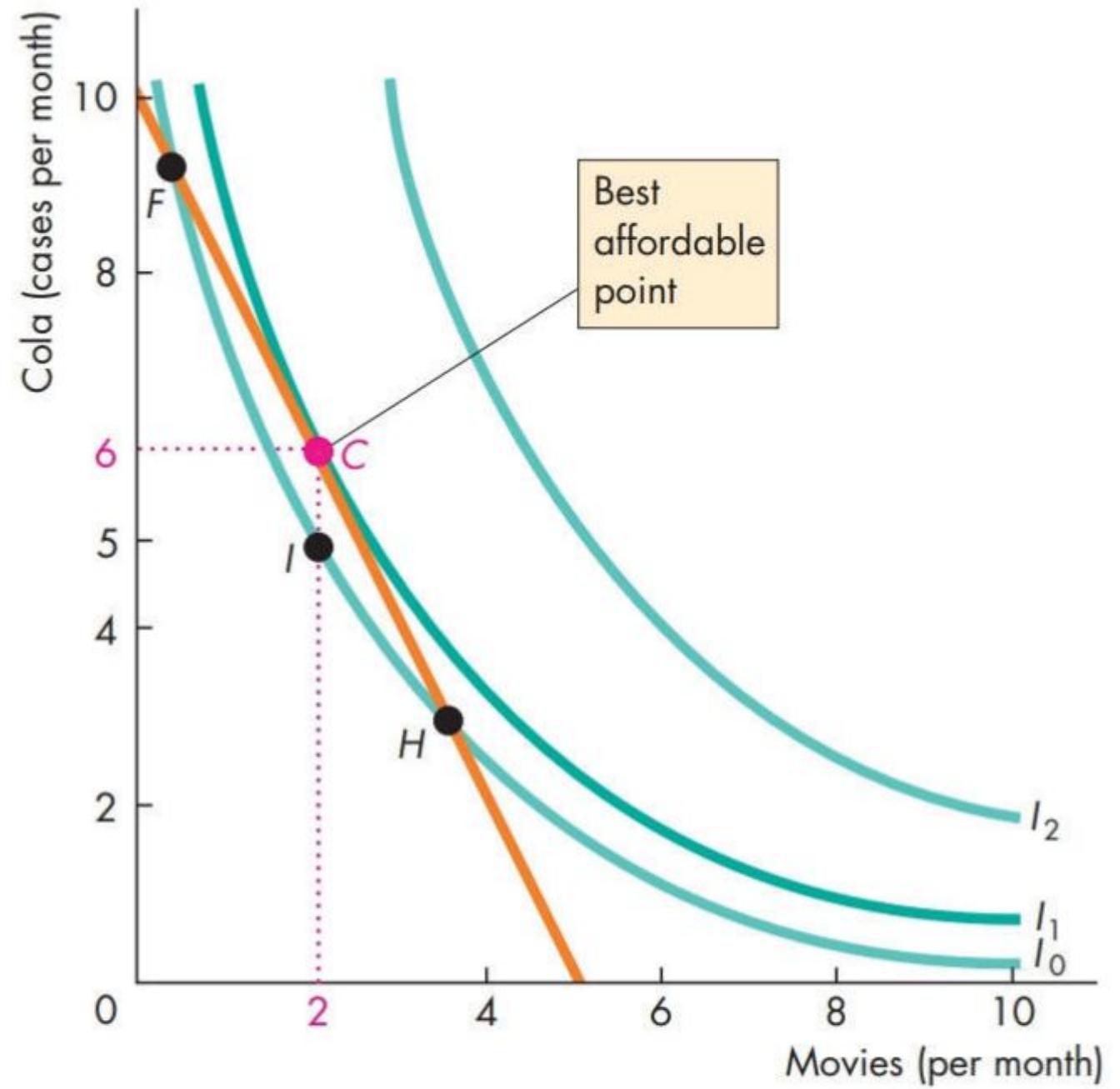
Ordinary Goods	Perfect Substitutes	Complements
<ul style="list-style-type: none"> • goods that can substitute each other to a certain degree • eg. movie and coke 	<ul style="list-style-type: none"> • goods that can very easily substitute for each other • eg. pens from Superstore and pens from Walmart 	<ul style="list-style-type: none"> • goods that complement each other, can't replace each other at all • eg. left and right sneakers

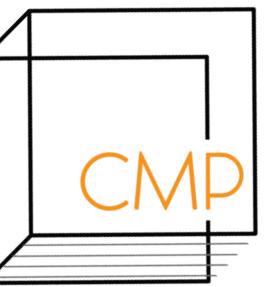




9. Utility & Demand - Best Affordable Choice

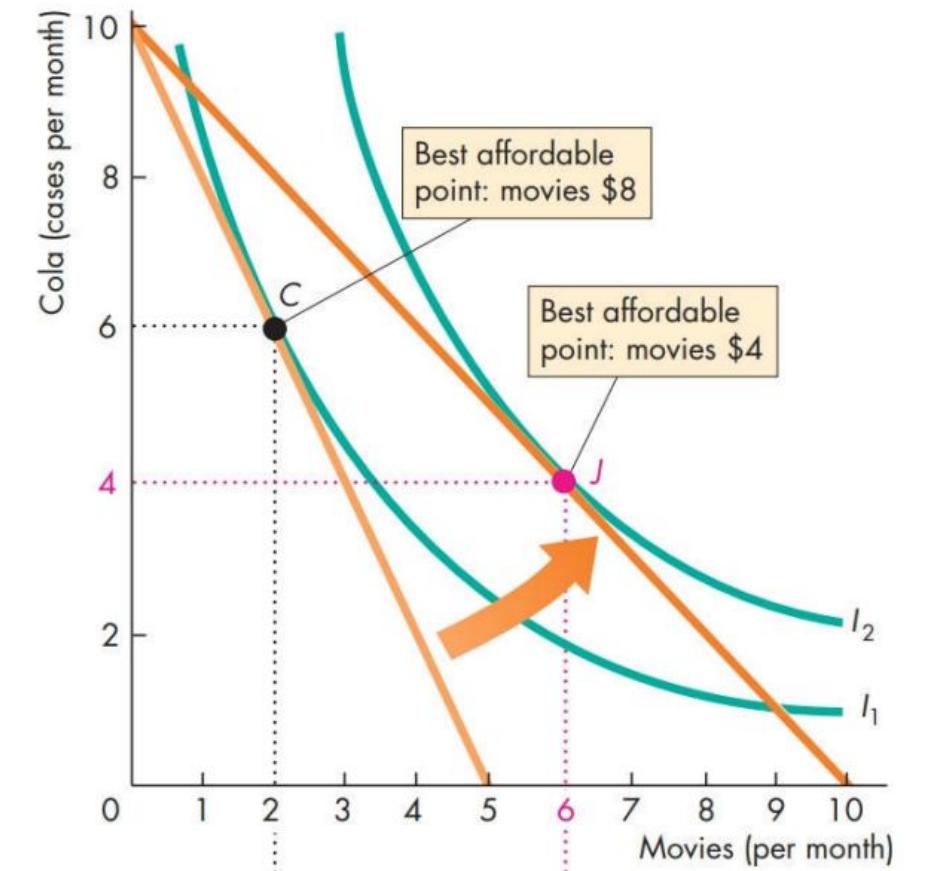
- **Characteristics of the best affordable choice:**
 - On the budget line (spent all of their income)
 - On the highest attainable indifference curve
 - MRS = the relative price of the 2 goods



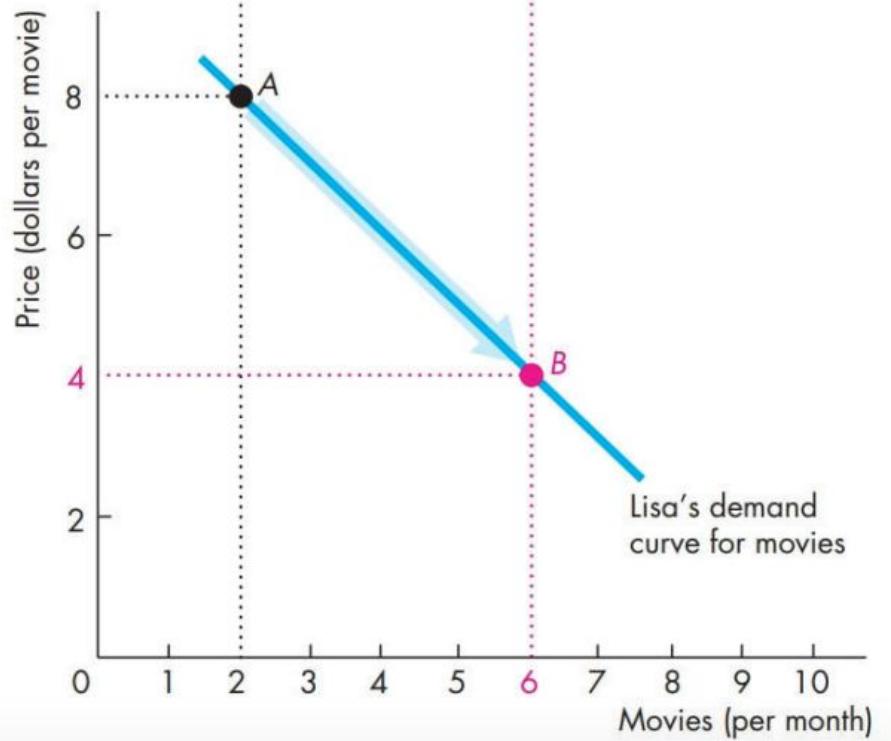


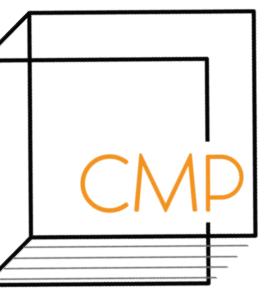
9. Utility & Demand - Price Effect

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



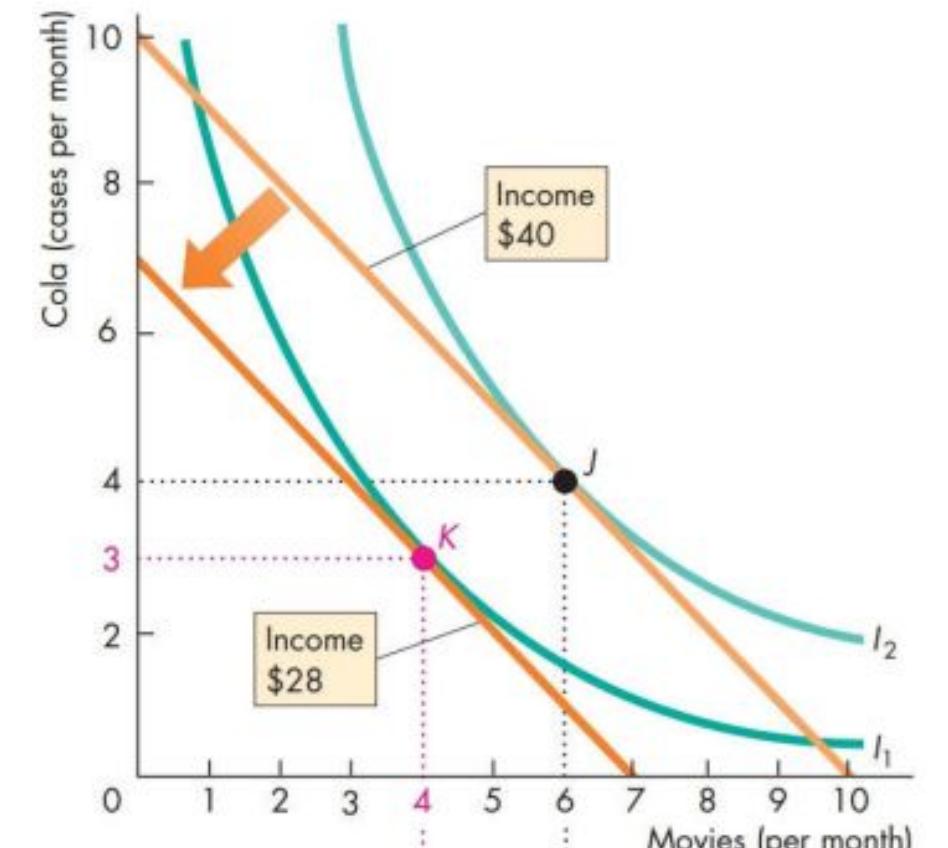
(a) Price effect



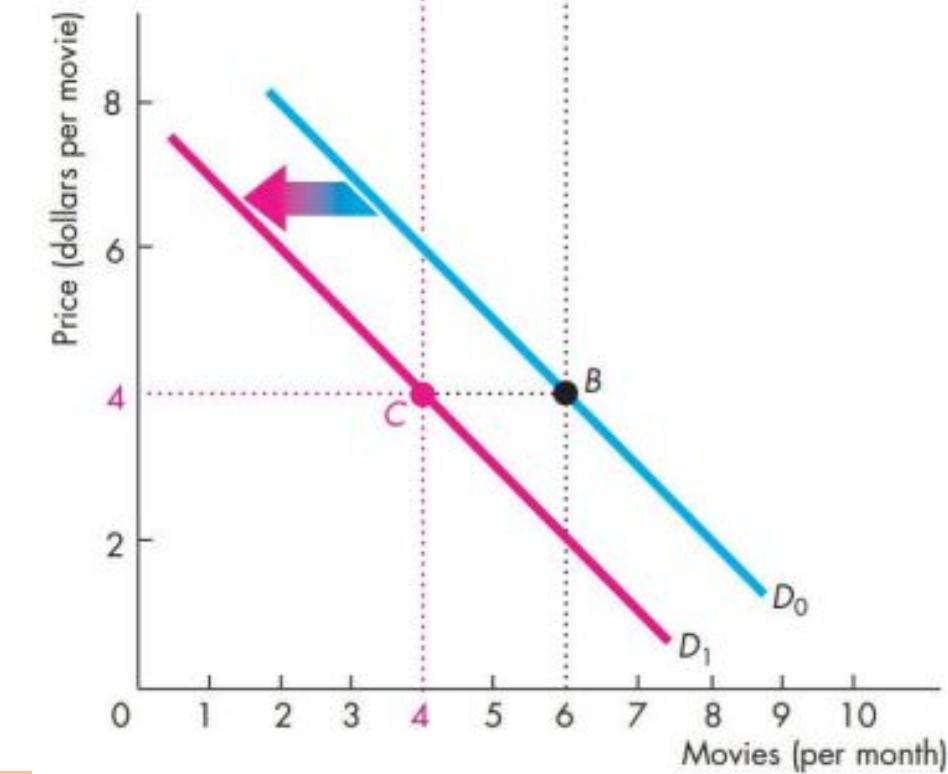


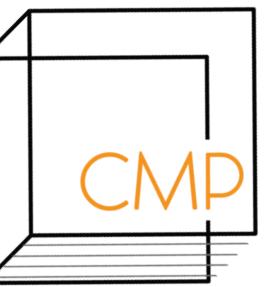
9. Utility & Demand - Income Effect

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



(a) Income effect





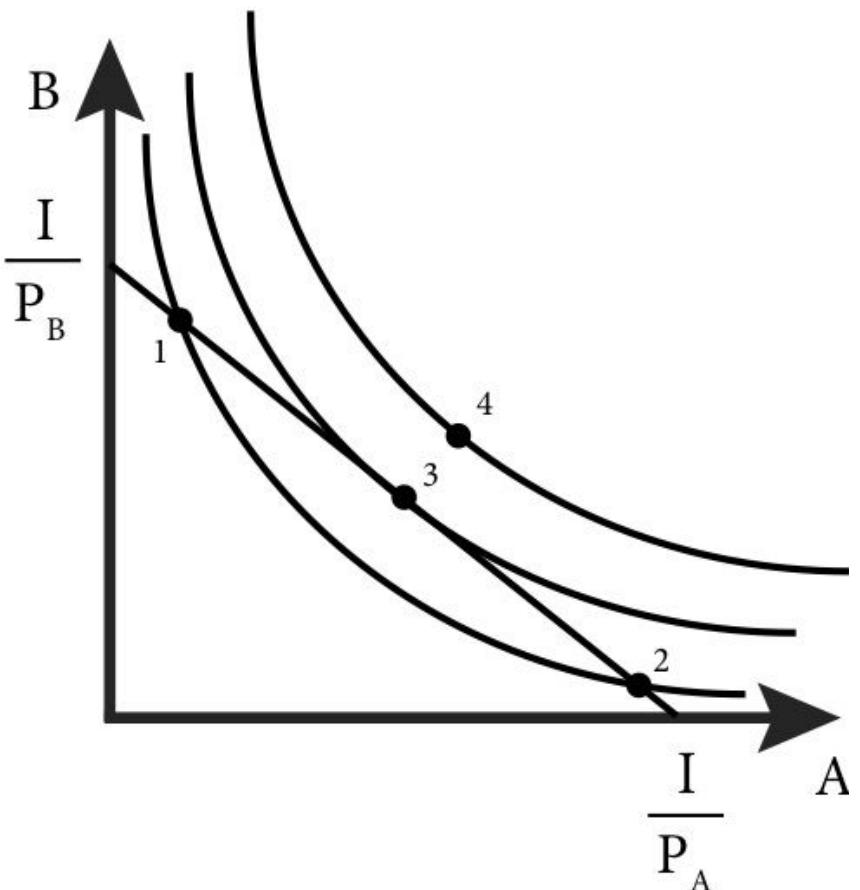
9. Utility & Demand - Price & Income Effect, Best Affordable Choice

Q31: The price effect explains the ____ of the demand curve, while the income effect explains the ____ of the demand curve.

- a. vertical intercept, horizontal intercept
- b. curviness, the vertical intercept
- c. slope, shifts

Q32: Looking at the diagram on the right, where is the best affordable choice?

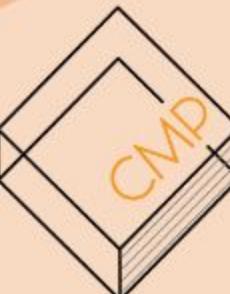
- a. Point 1
- b. Point 2
- c. Point 3
- d. Point 4



Break Time!



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