Microeconomics for small screens

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Abbreviations *micro*

AC	Average cost
AR	Average revenue
AT	Average tax
ATC	Average total cost
AVC	Average variable cost
Ce	Cross-price elasticity of D
D	Demand
e	Price elasticity of demand
Ie	Income elasticity of D
LR	Long-run
MC	Marginal cost
MR	Marginal revenue
MT	Marginal tax
MU	Marginal utility
P	Price
PPF	Production possibilities frontier
Q	Quantity

qd	Quantity demanded
S	Supply
Se	Price elasticity of supply
SR	Short-run
Su	Subsidy
T	Tax
TC	Total cost
TR	Total revenue
TU	Total utility

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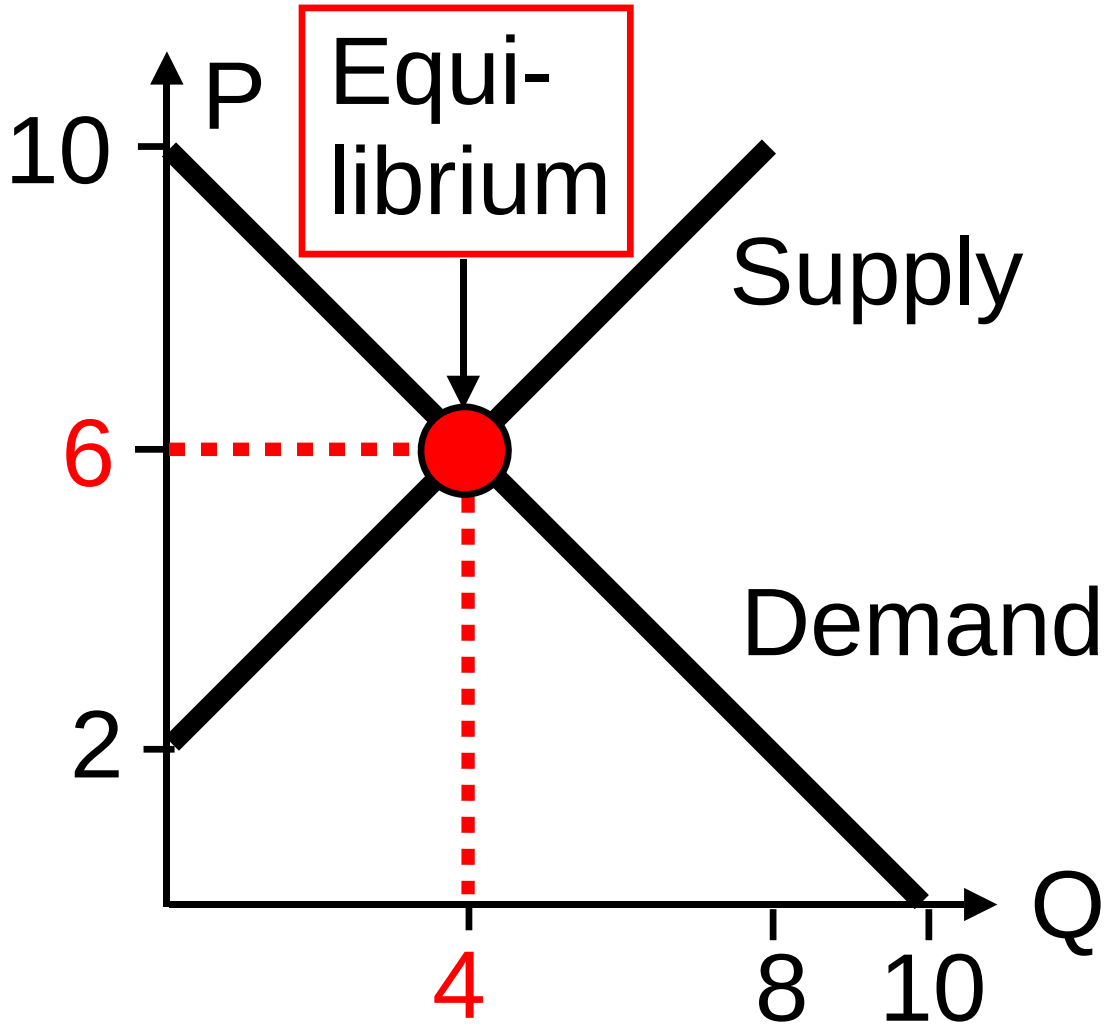
1.1 Market equilibrium



- **Demand** (Q) = 10 - P
  Supply (Q) = P - 2
- **At equilibrium:**
  Demand = Supply; hence:
  10 - P = P - 2
  P = 6 and Q = 4

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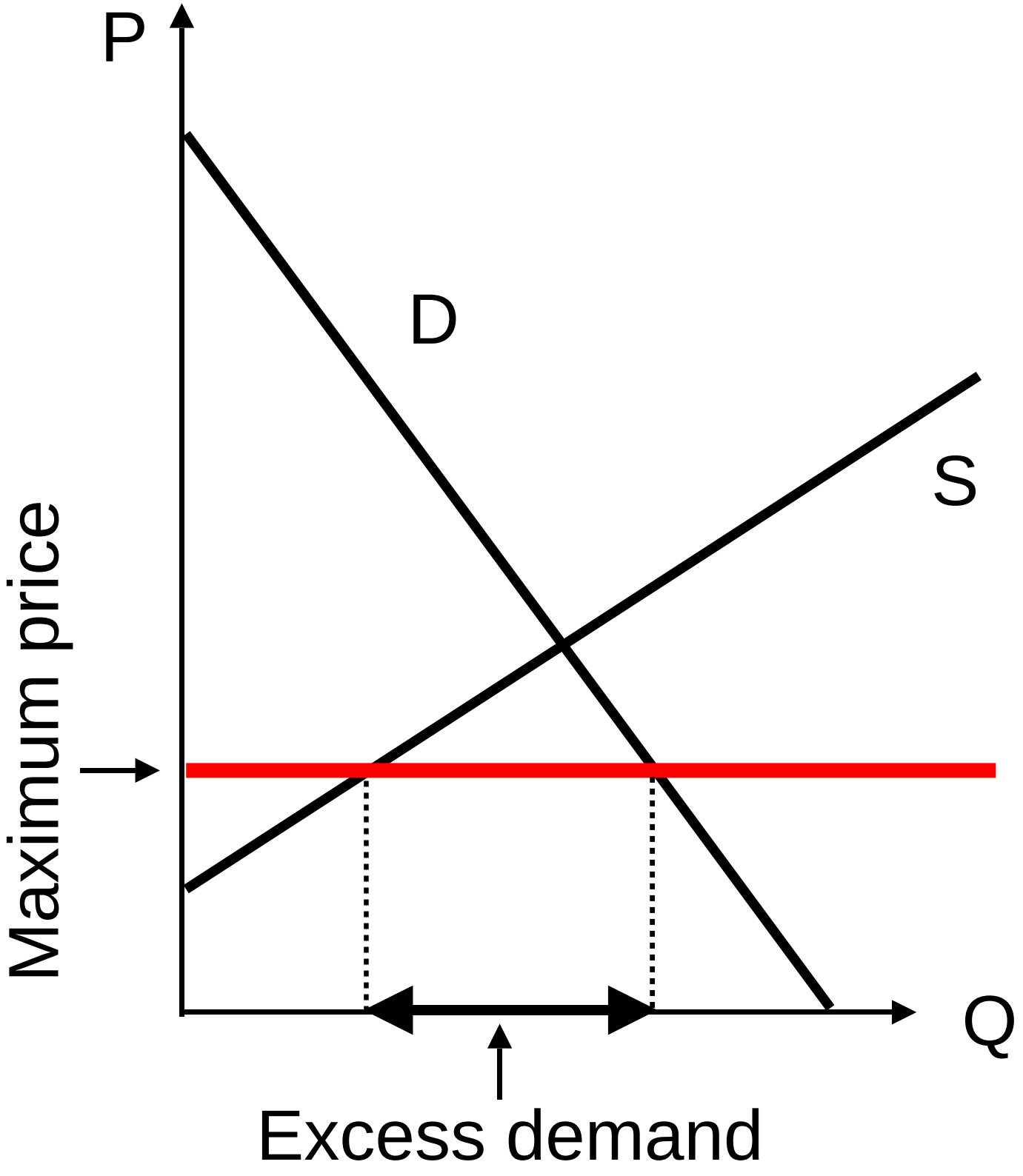
1.2 Market disequilibrium 1 - Maximum price (ceiling)



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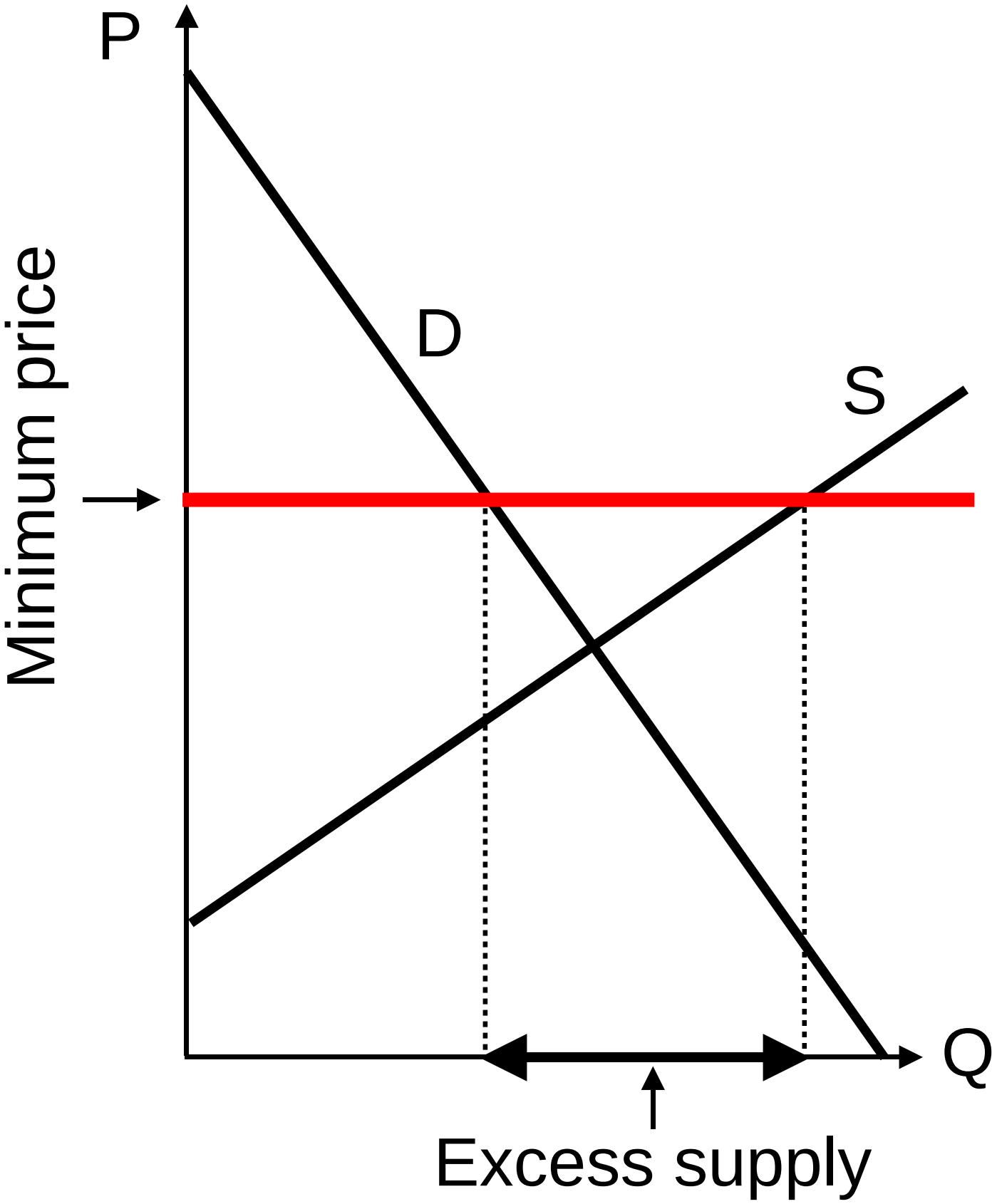
1.3 Market disequilibrium 2 - Minimum price (floor)



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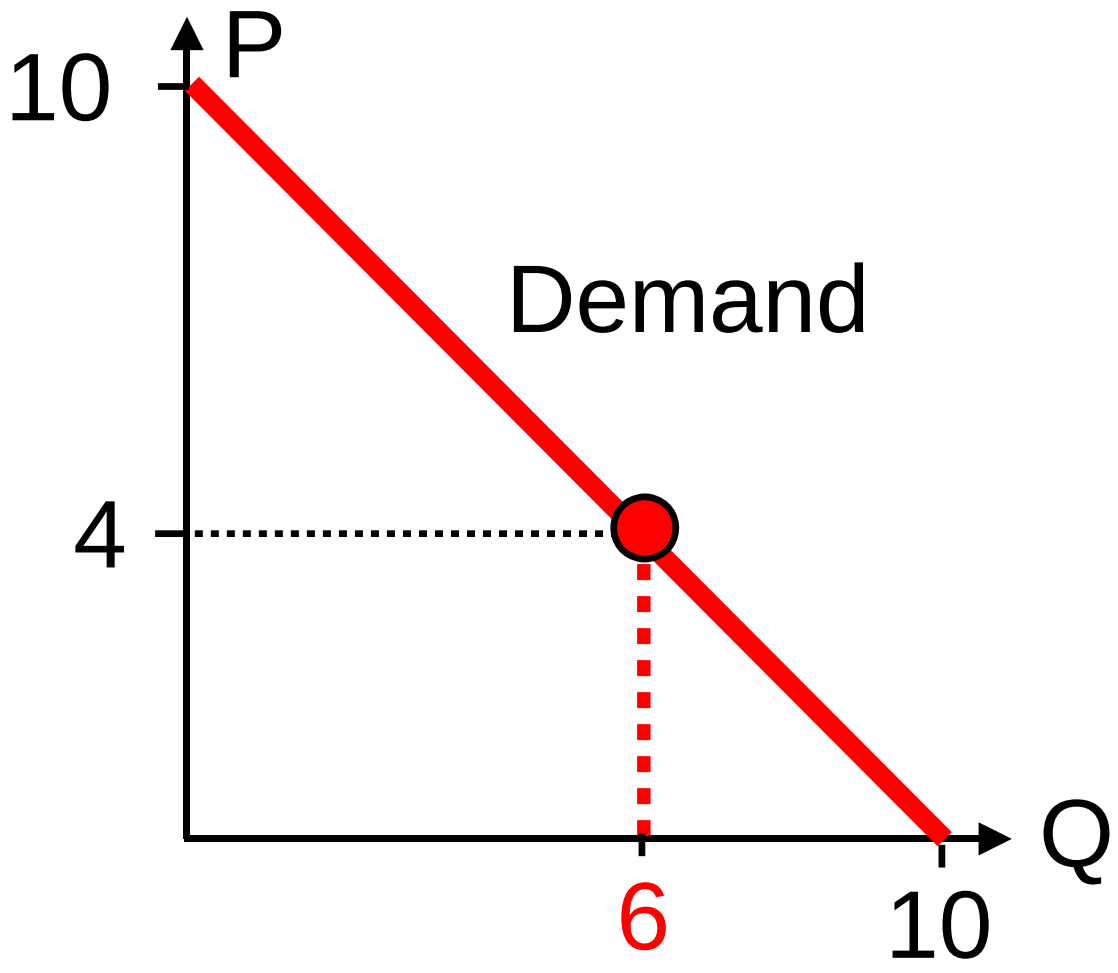
1.4 Demand and quantity demanded



- **Demand** refers to the curve and displays the relationship between prices and quantities demanded.
- **Quantity demanded** refers to a point on the curve.
  Example: If P = 4, then Q = 6;
  6 is the quantity demanded.

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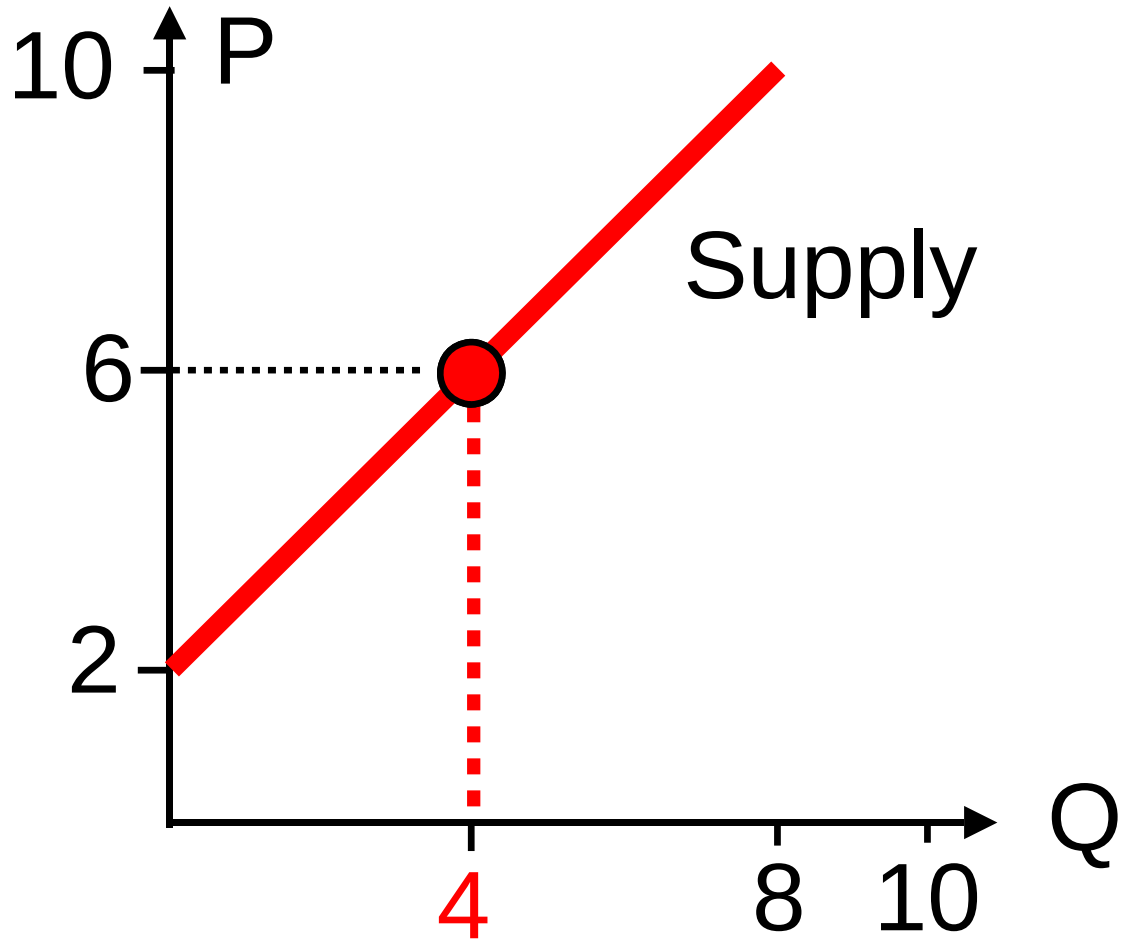
1.5 Supply and quantity supplied



- **Supply** refers to the curve and displays the relationship between prices and quantities supplied.
- **Quantity supplied** refers to a point on the curve.
  Example: If P = 6, then Q = 4;
  4 is the quantity supplied.

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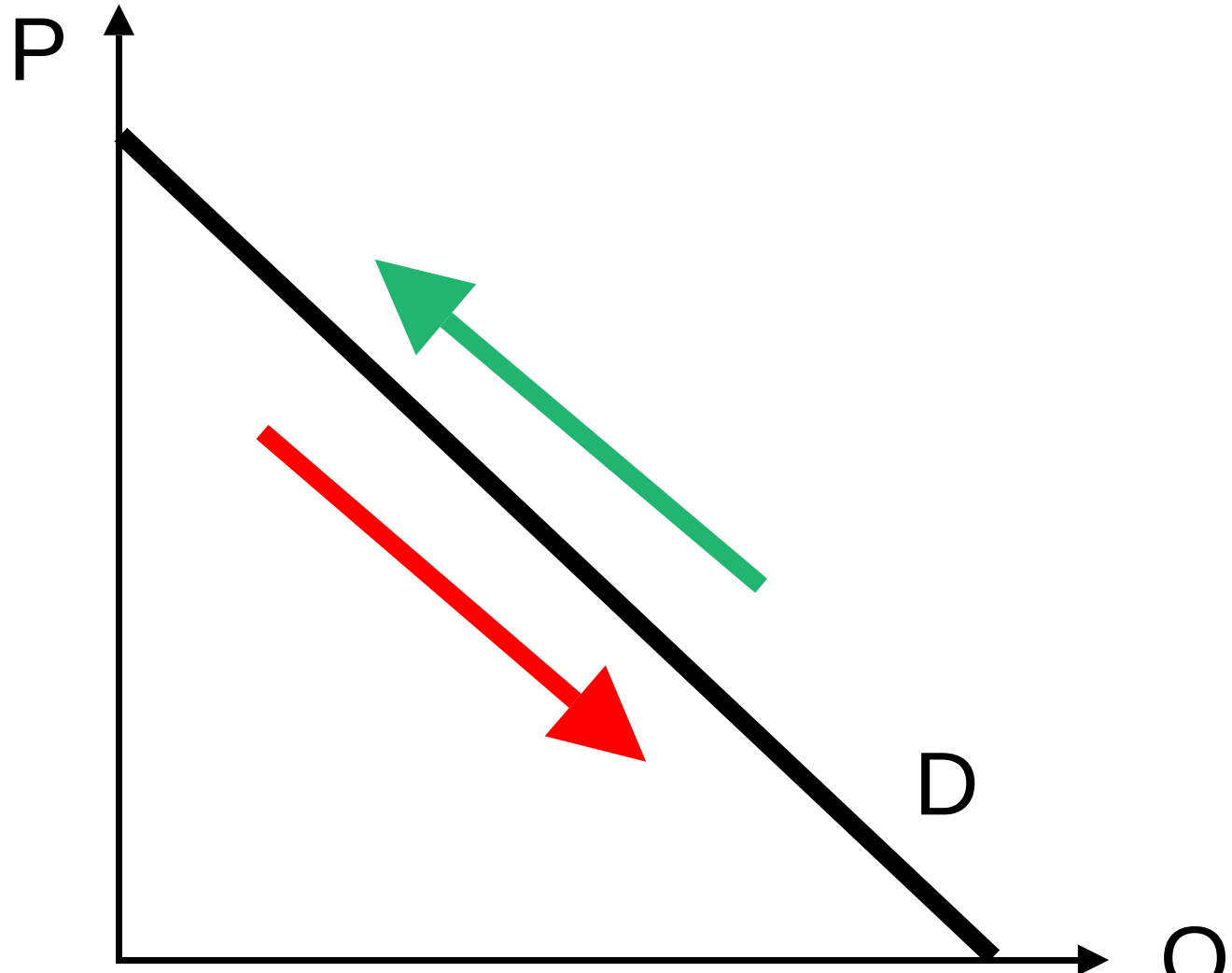
1.6 Movements along the demand curve



P **increases**, quantity demanded **decreases**

P **decreases**, quantity demanded **increases**

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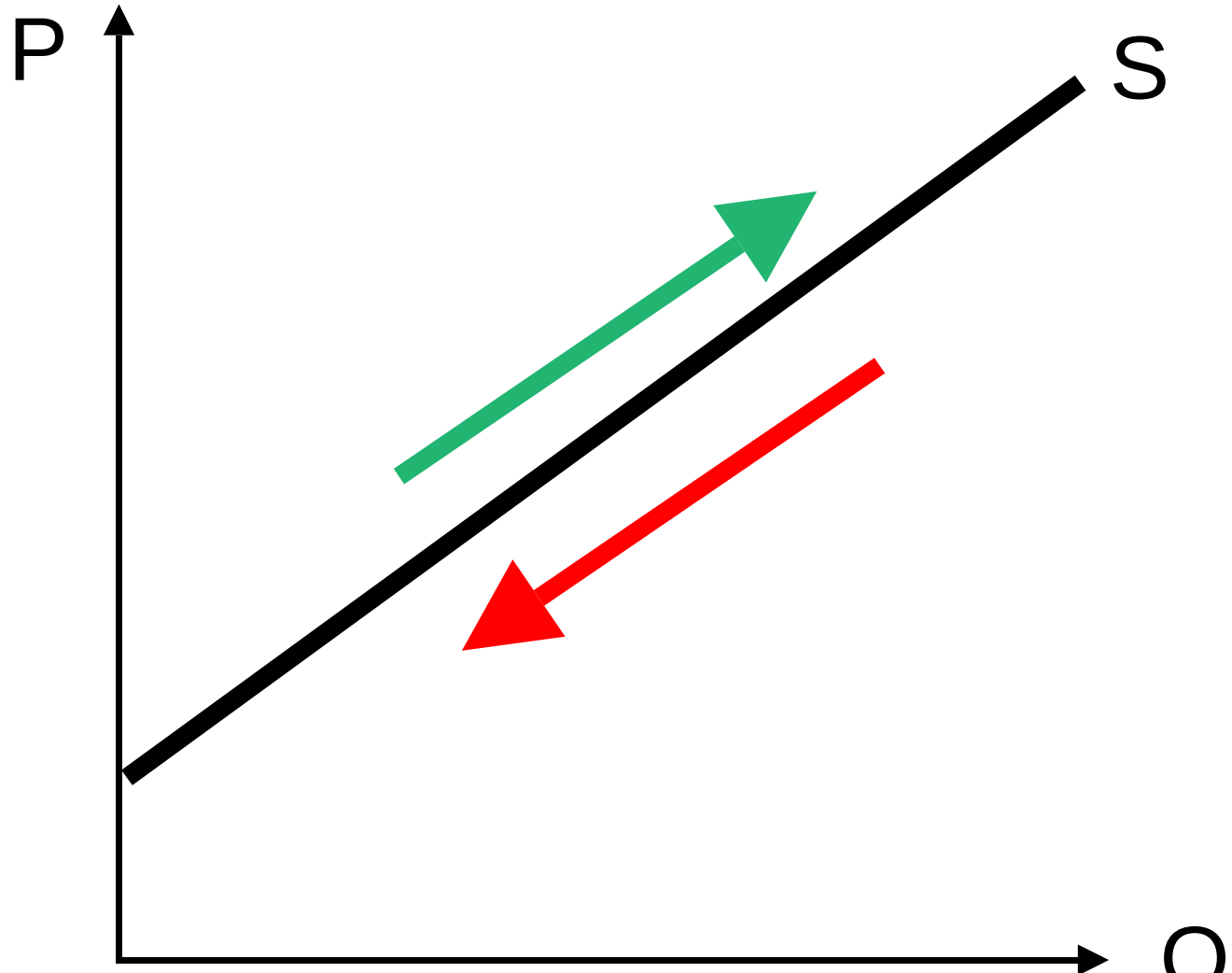
1.7 Movements along the supply curve



P and quantity supplied **increase**

P and quantity supplied **decrease**

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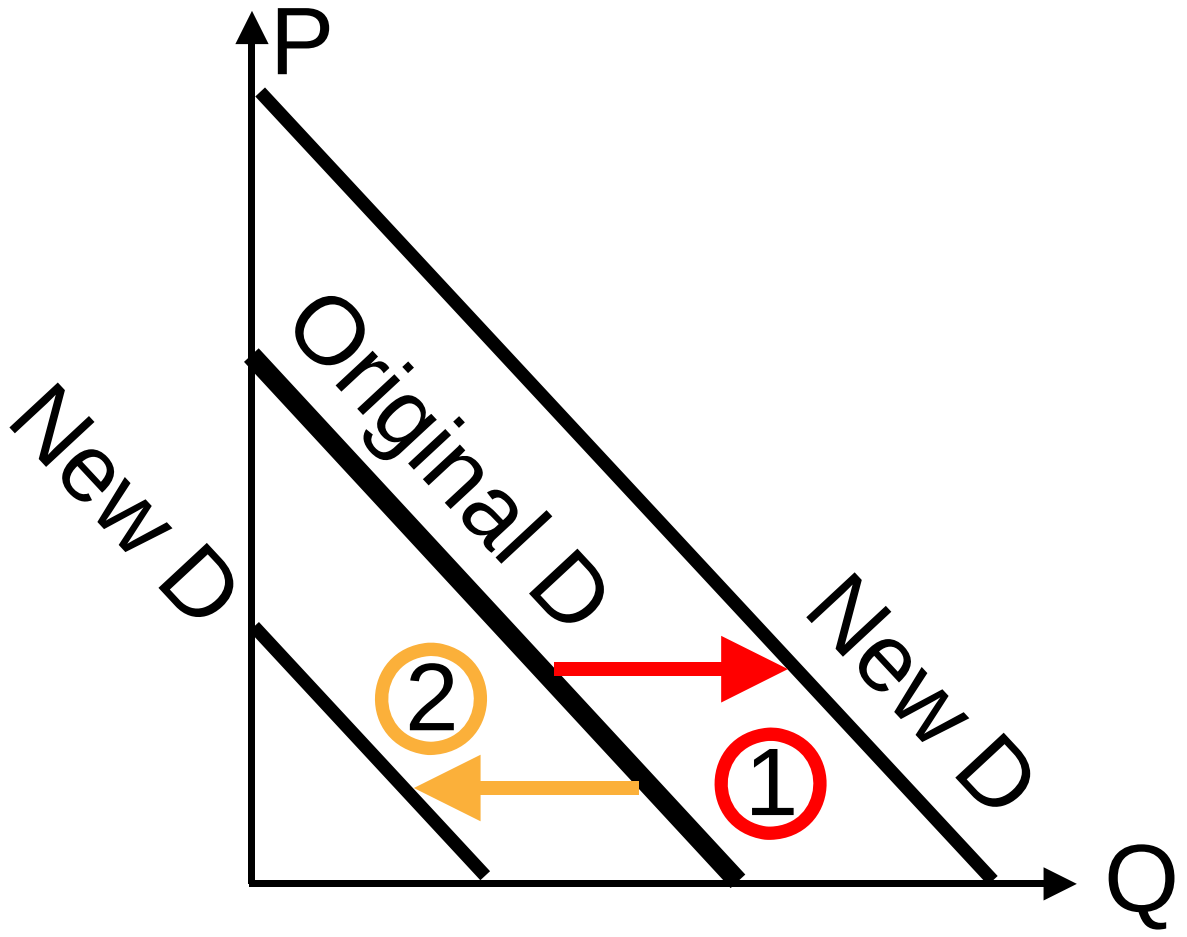
1.8 Shifts in demand



① **Increase** in D (outward shift)

② **Decrease** in D (inward shift)

Possible reasons: Changes in

- income
- the prices of **other** goods
- tastes
- the number of consumers

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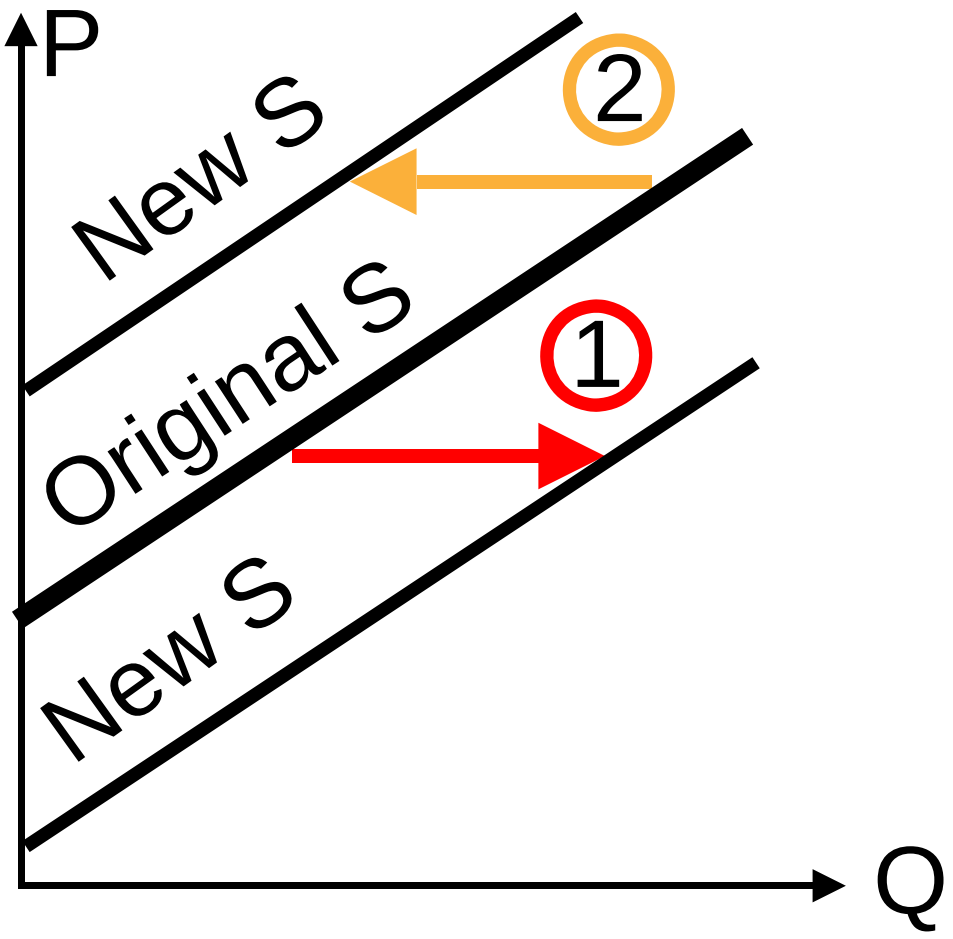
1.9 Shifts in supply



① **Increase** in S (outward shift)

② **Decrease** in S (inward shift)

Possible reasons: Changes in the

- cost of production
- technology
- regulations by the state (taxes)
- number of suppliers

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2.1 Elasticities (types)

Price elasticity of demand	$= \frac{\%\text{ change in qd}}{\%\text{ change in price}}$ (result in absolute values)
Cross-price elasticity of demand	$= \frac{\%\text{ change in qd of good X}}{\%\text{ change in price of good Y}}$
Income elasticity of demand	$= \frac{\%\text{ change in qd}}{\%\text{ change in income}}$
Price elasticity of supply	$= \frac{\%\text{ change in quantity supplied}}{\%\text{ change in price}}$

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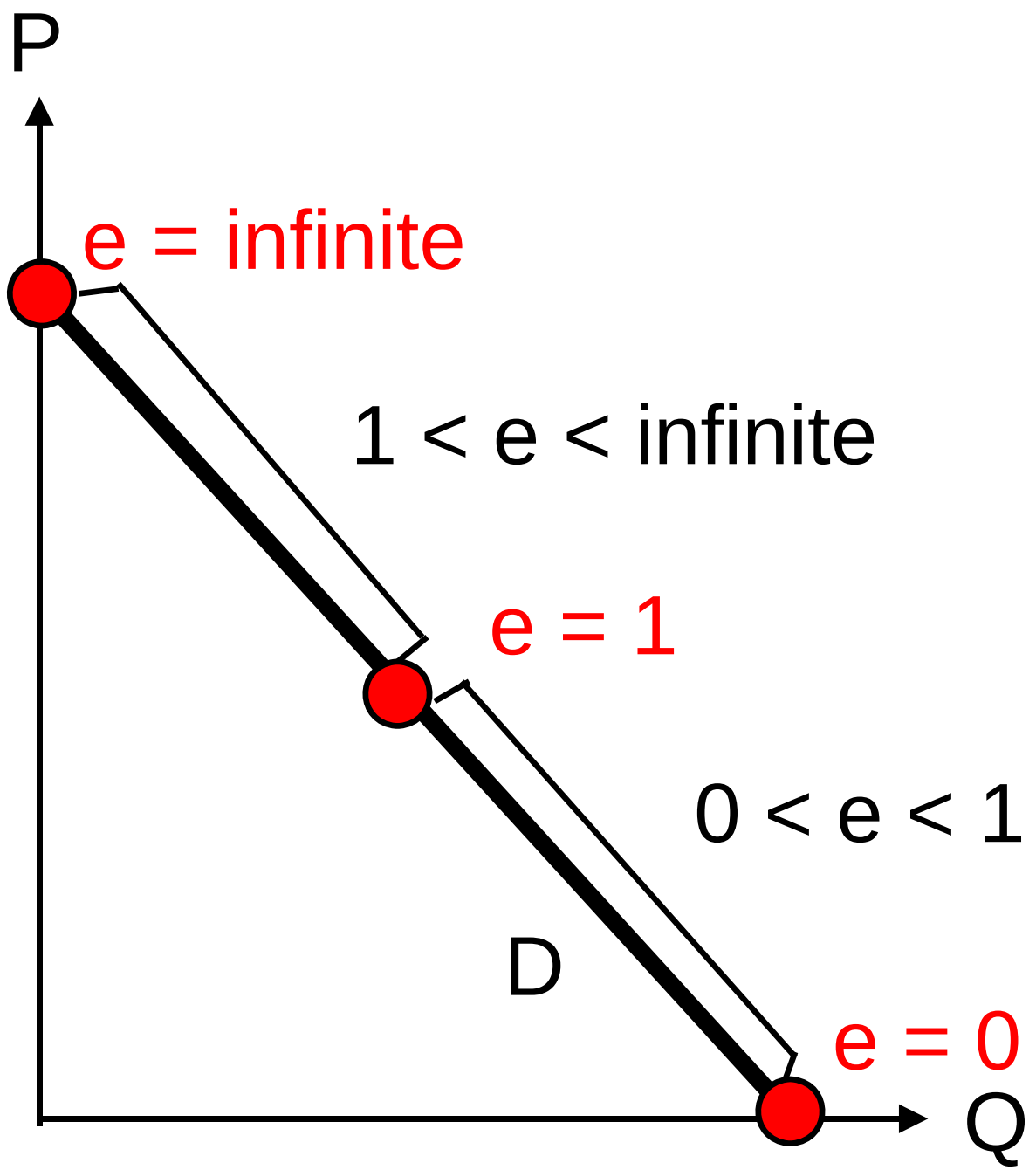
2.2 Price elasticity of demand along a linear demand curve



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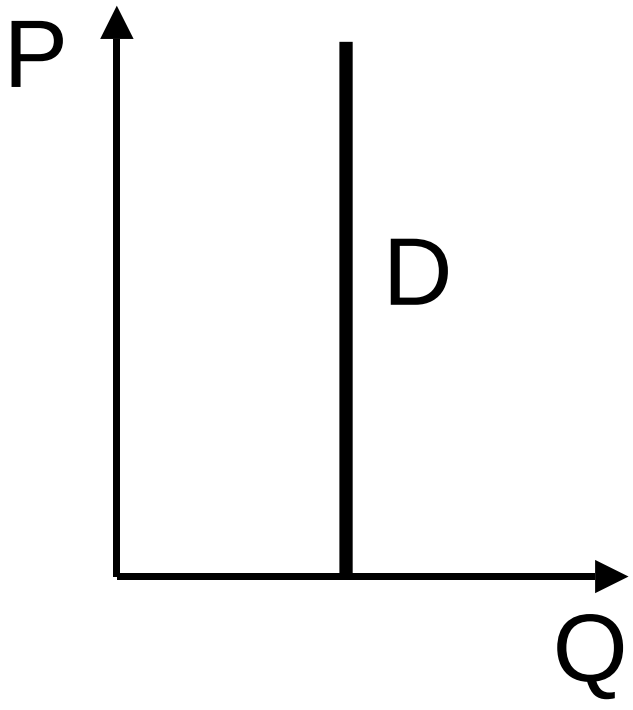
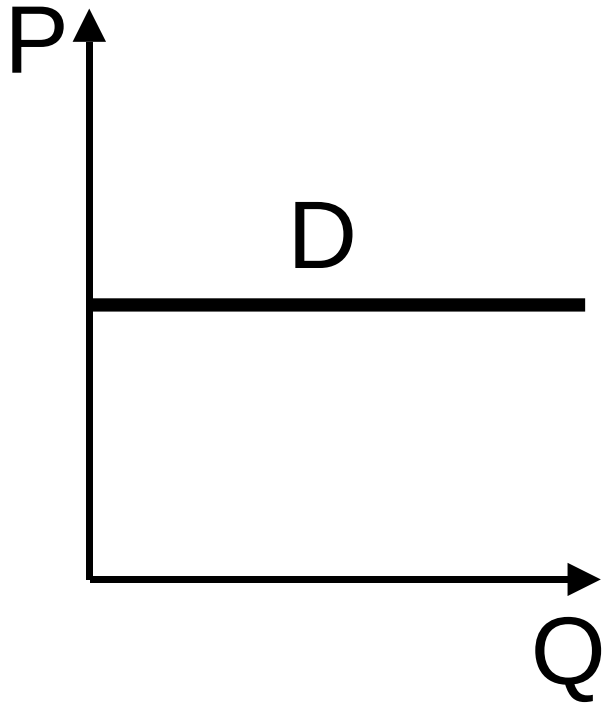
2.3 **Constant** price elasticities of demand

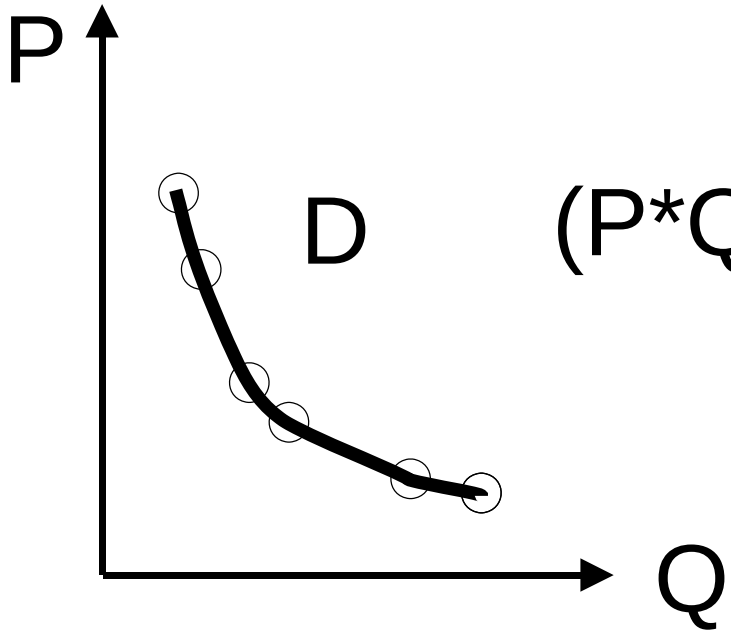
e = 0



e = infinite



e = 1



(P*Q) is constant.

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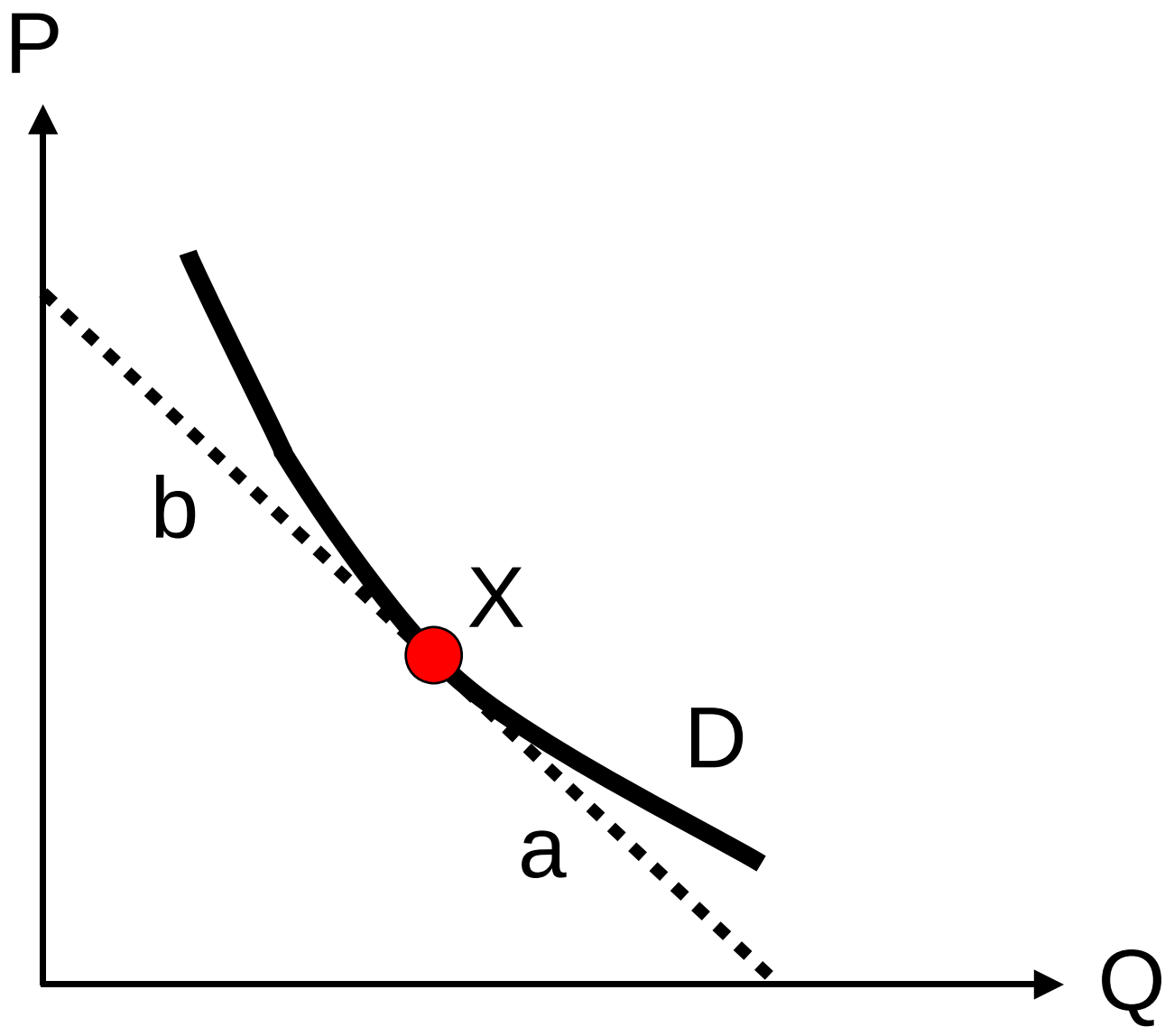
2.4 Price elasticity of demand at the point X of a demand curve



Steps:

1 Tangent at X (----------)

2 e = a/b

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2.5 Price elasticity of demand and total revenue

	Price elasticity of demand		
	e > 1	e = 1	e < 1
Prices rise	**TR-**	**TR0**	**TR+**
Prices fall	**TR+**	**TR0**	**TR-**

TR+ Total revenue rises

TR- Total revenue falls

TR0 Total revenue unchanged

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2.6 Cross-price elasticity of demand

$$= \frac{\%\ \text{change in qd of good X}}{\%\ \text{change in P of good Y}}$$

Ce > 0 → Substitutes

Ce < 0 → Complements

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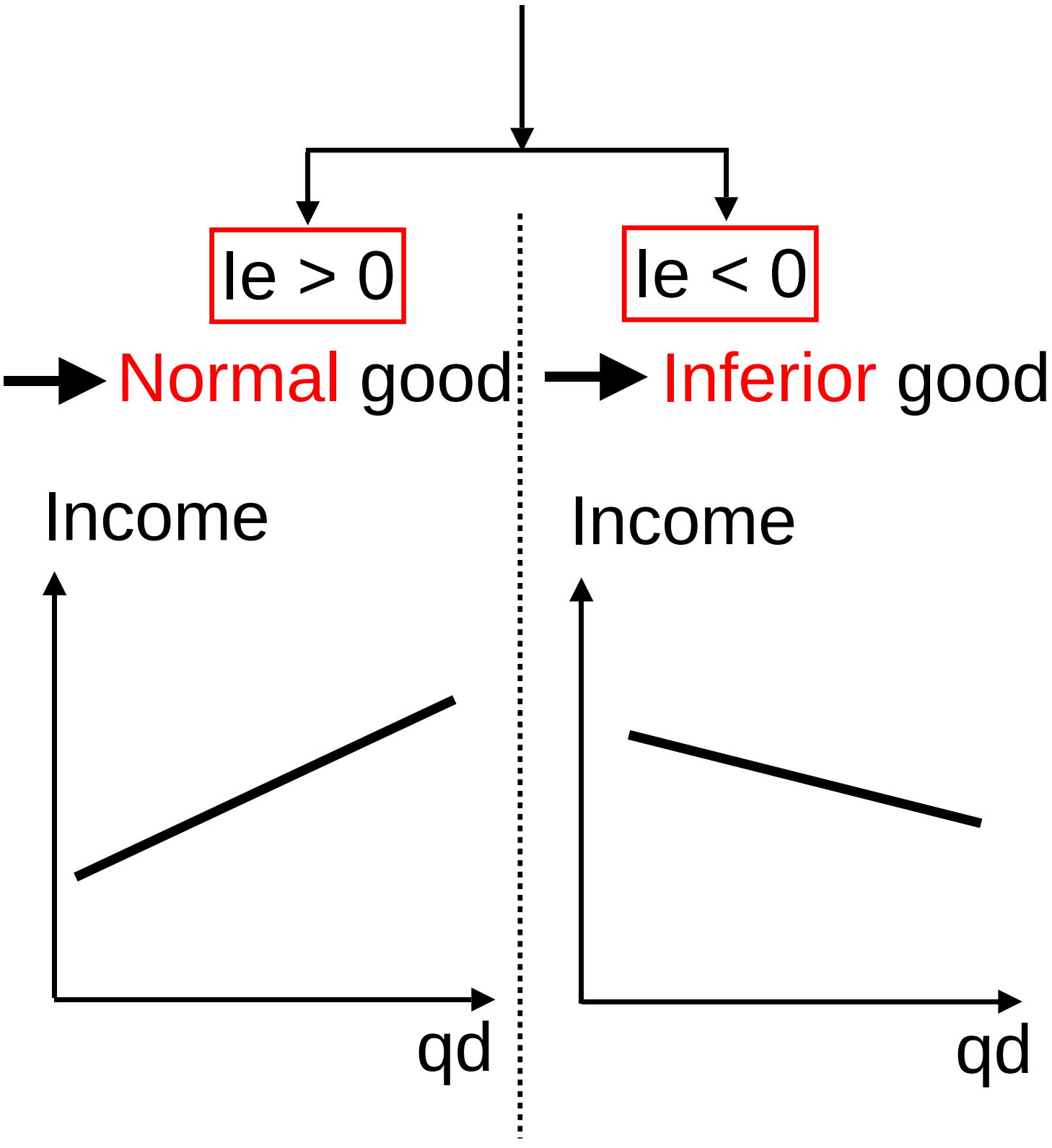
2.7 Income elasticity of demand

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



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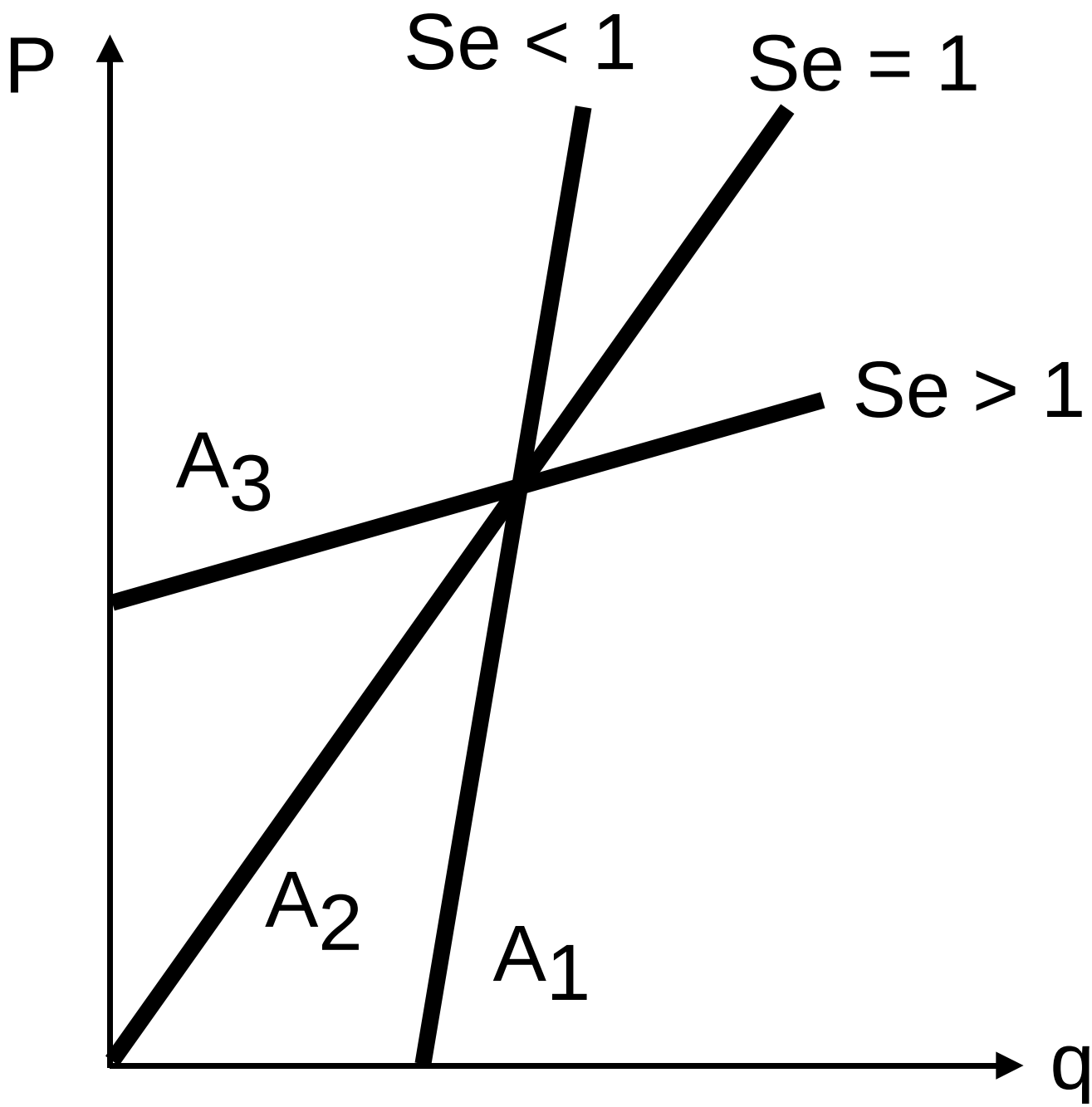
2.8 Price elasticity of supply (cases)

$$Se = \frac{\%\ \text{change in quantity supplied}}{\%\ \text{change in P}}$$



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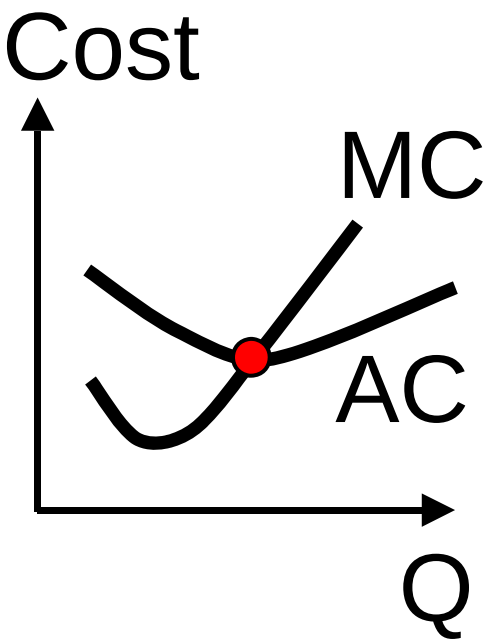
3.1 Costs

- Total cost = Fixed + variable cost
  - Fixed cost: Independent of Q
  - Variable cost: Dependent on Q
- Average Cost = $\frac{TC}{Q}$
- Marginal Cost = $\frac{\text{Change in TC}}{\text{Change in Q}}$

  or Marginal Cost = (TC)’

- Relation between AC and MC



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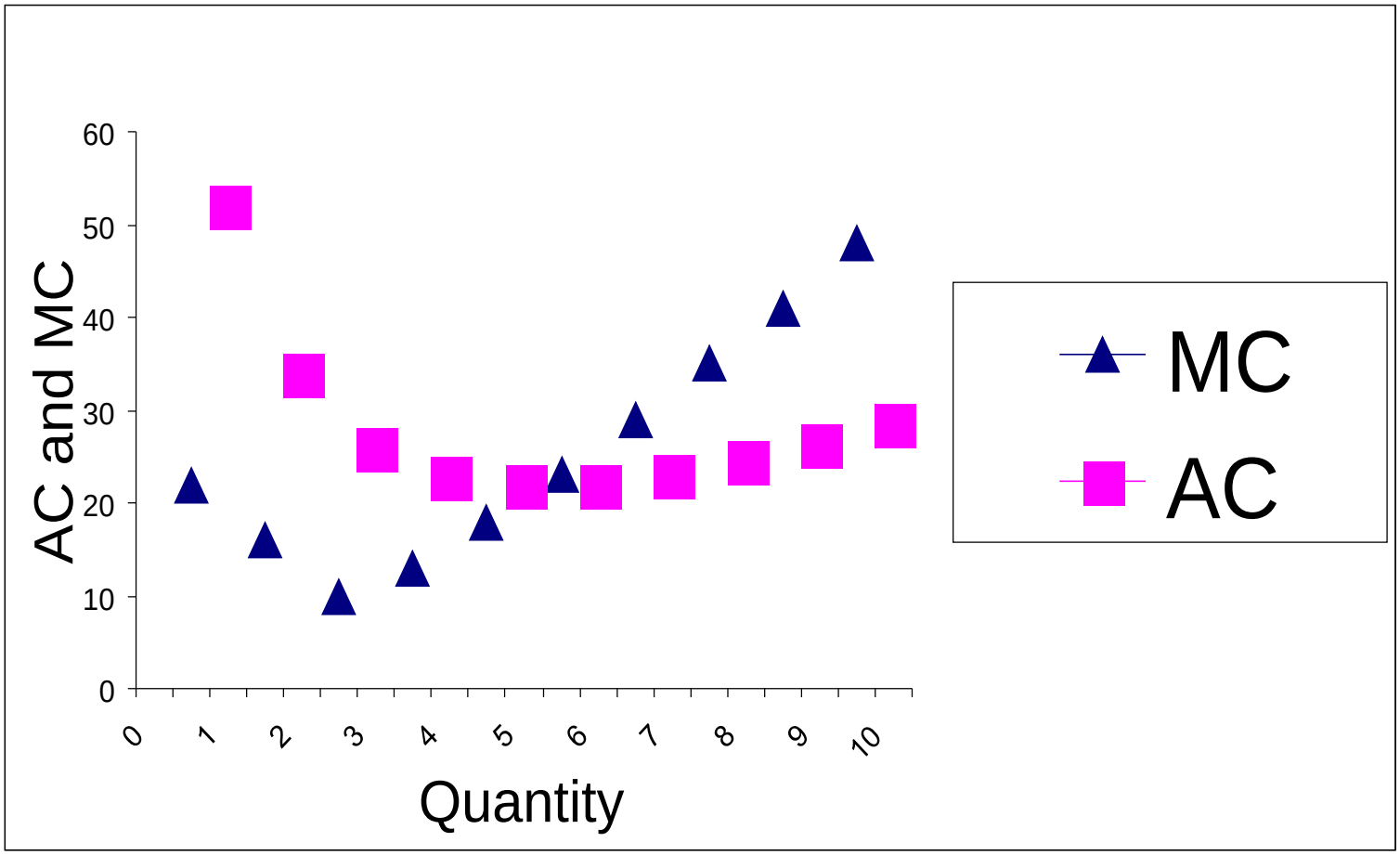
3.2 Relations between marginal cost and average cost



1 If MC < AC, then AC falls
2 If MC > AC, then AC rises
3 The marginal cost curve cuts the average cost curve at its minimum.

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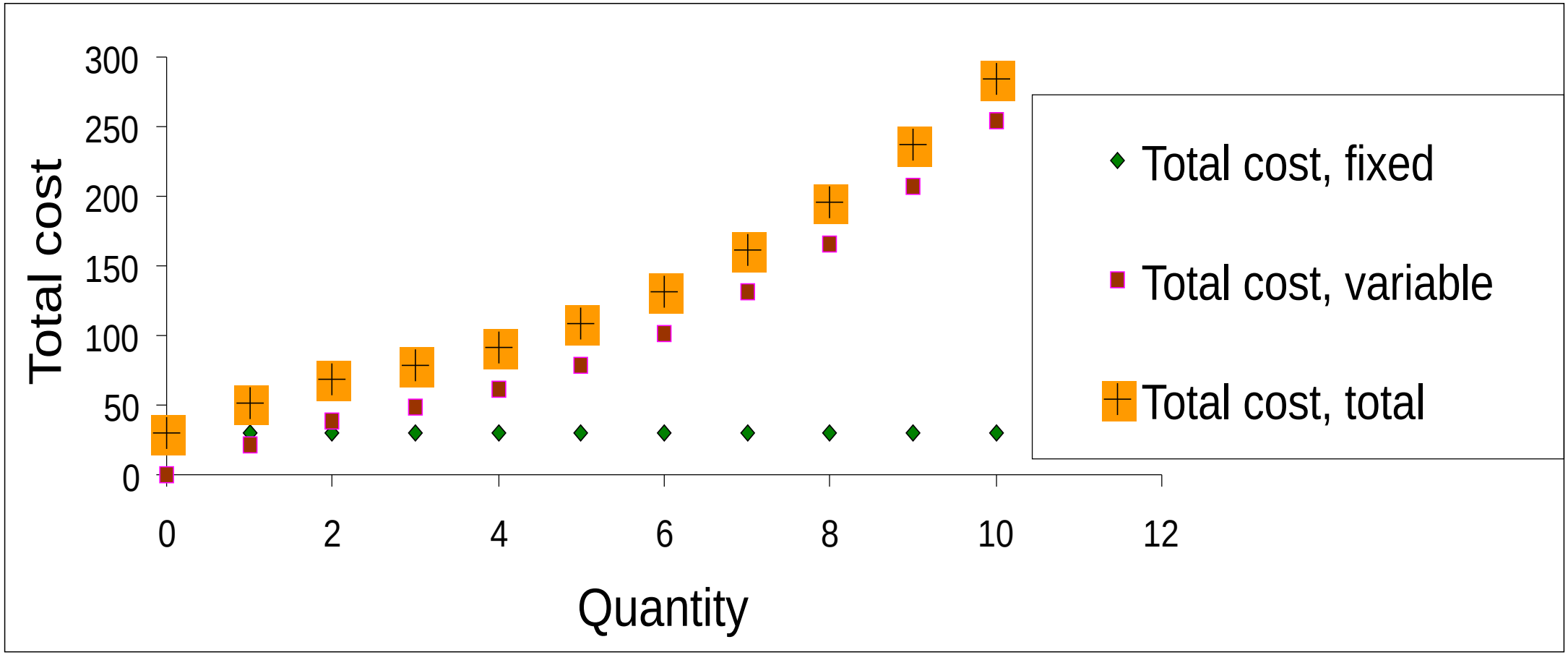
3.3 Total cost (short-run)



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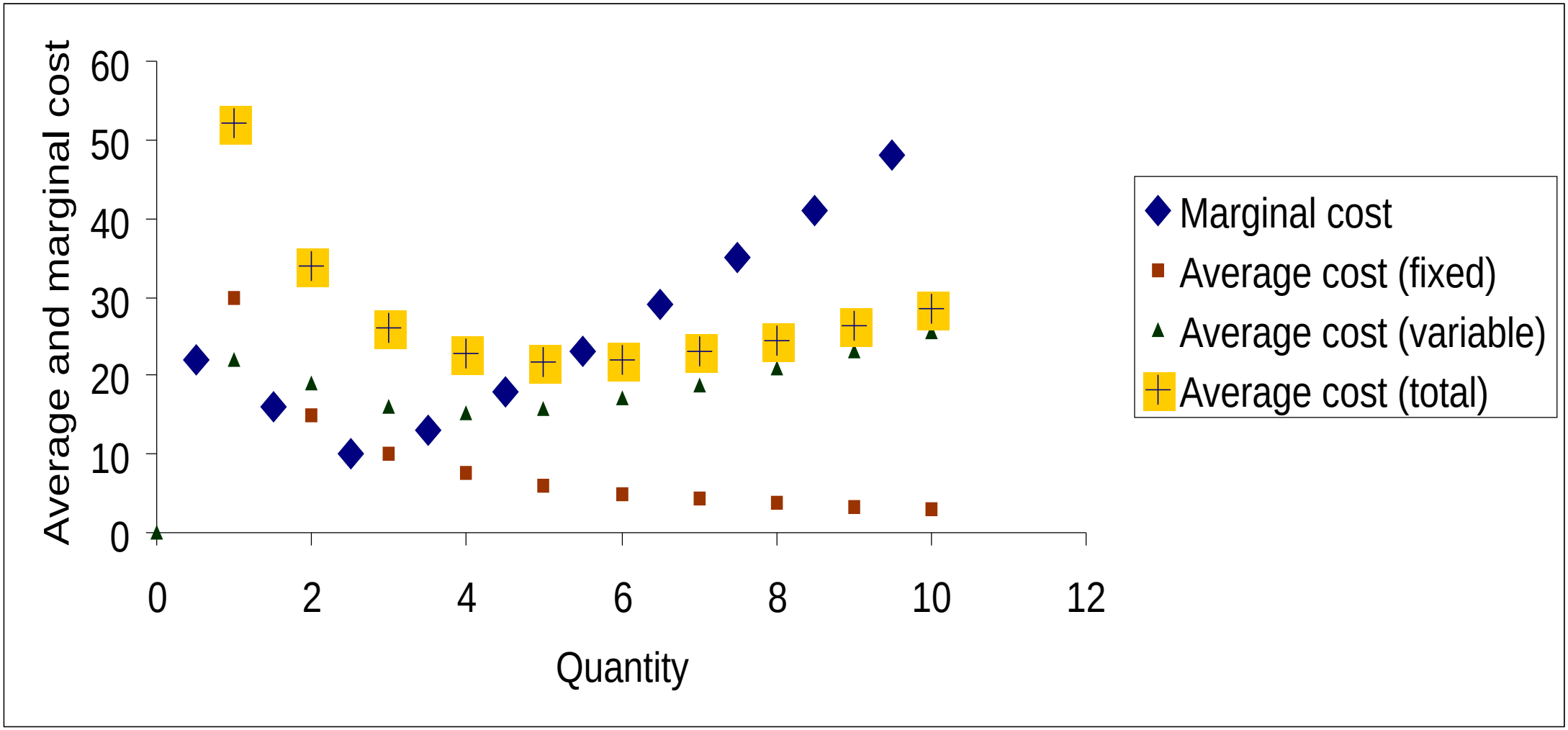
3.4 Average cost and marginal cost (short-run)



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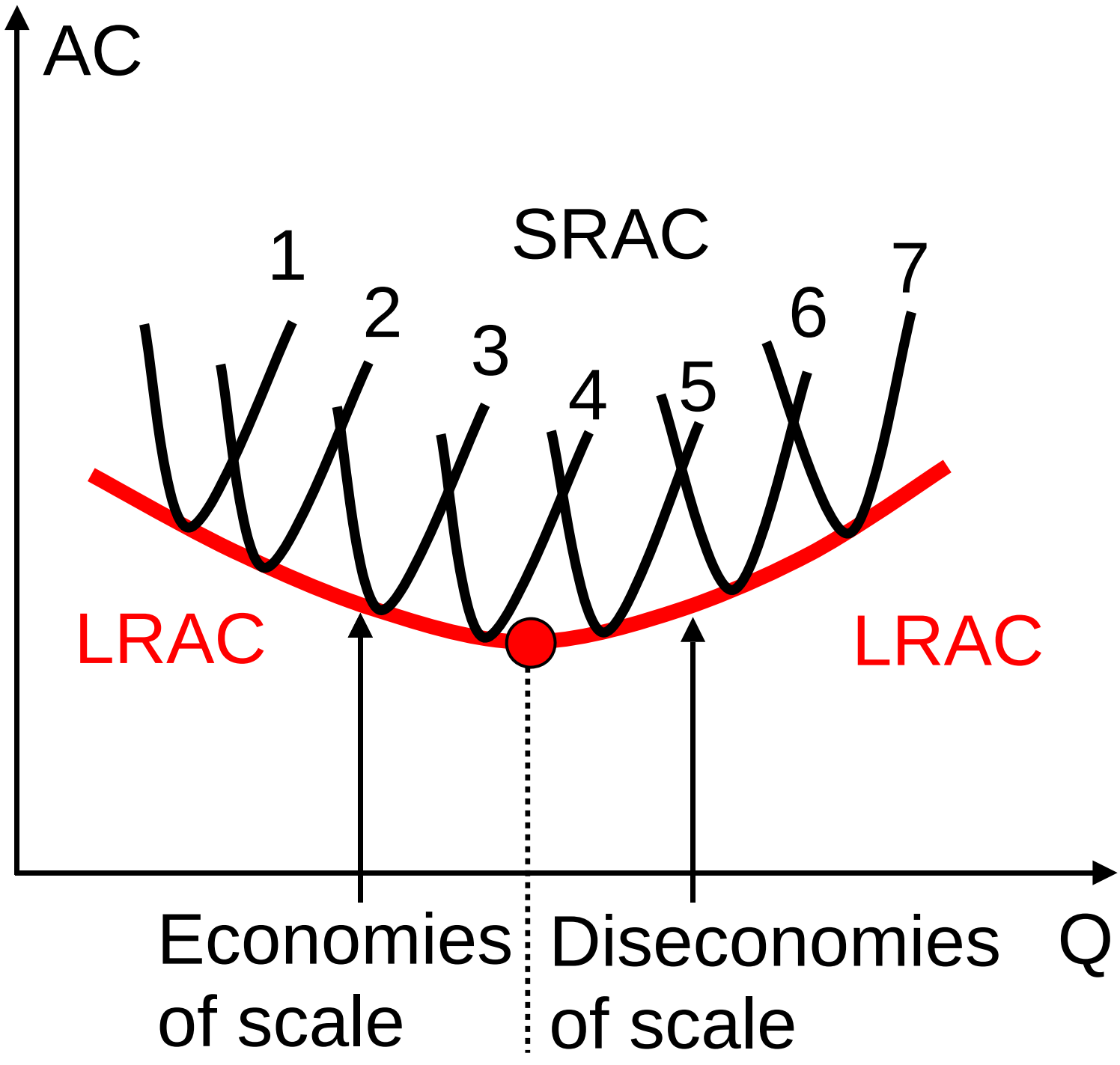
3.5 Cost curves (short-run and long-run)



SRAC = Short-run average cost
LRAC = Long-run average cost

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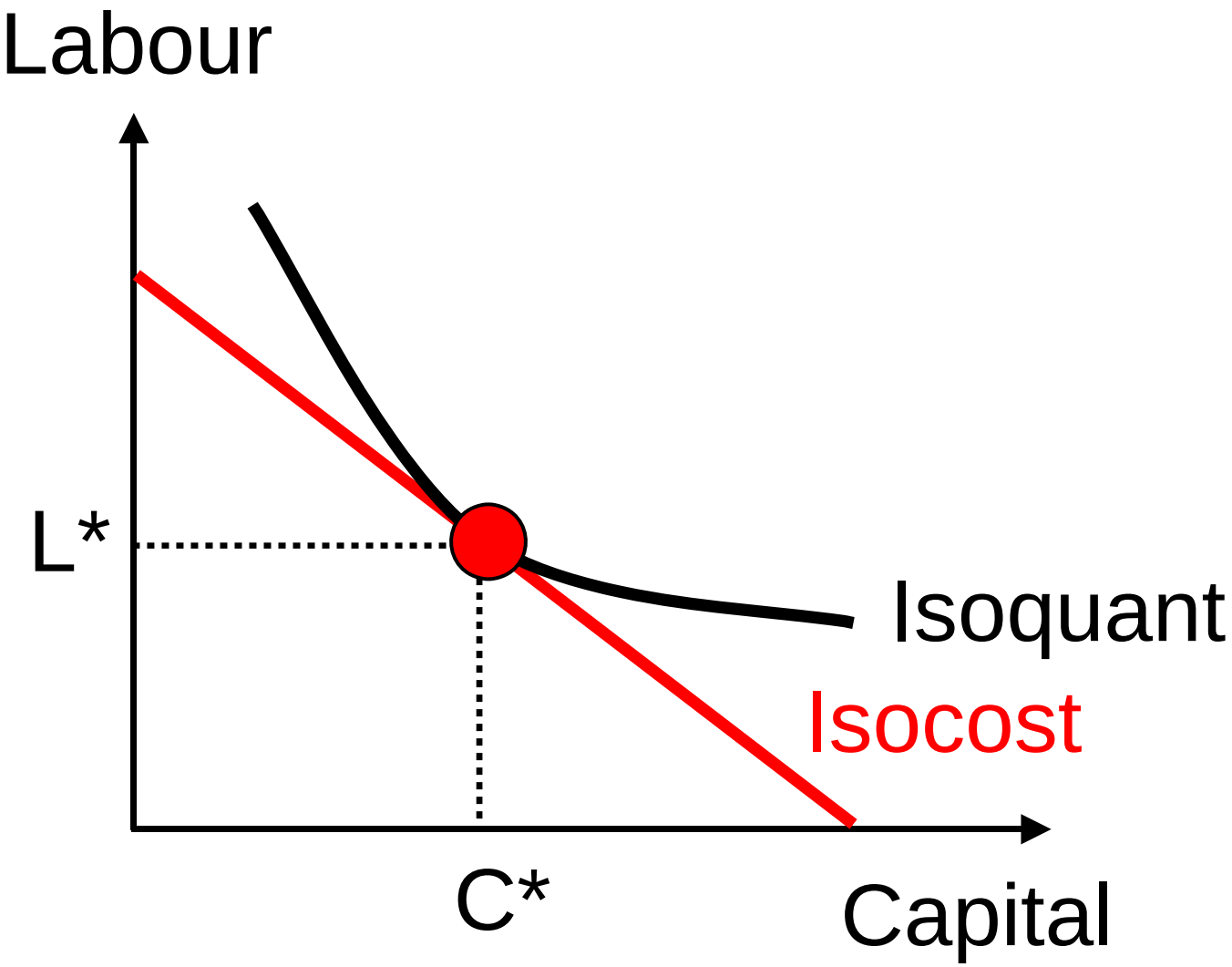
3.6 Cost minimization



Isoquant curve:
different factor combinations
to produce given output

Isocost line:
different factor combinations
with equal TC

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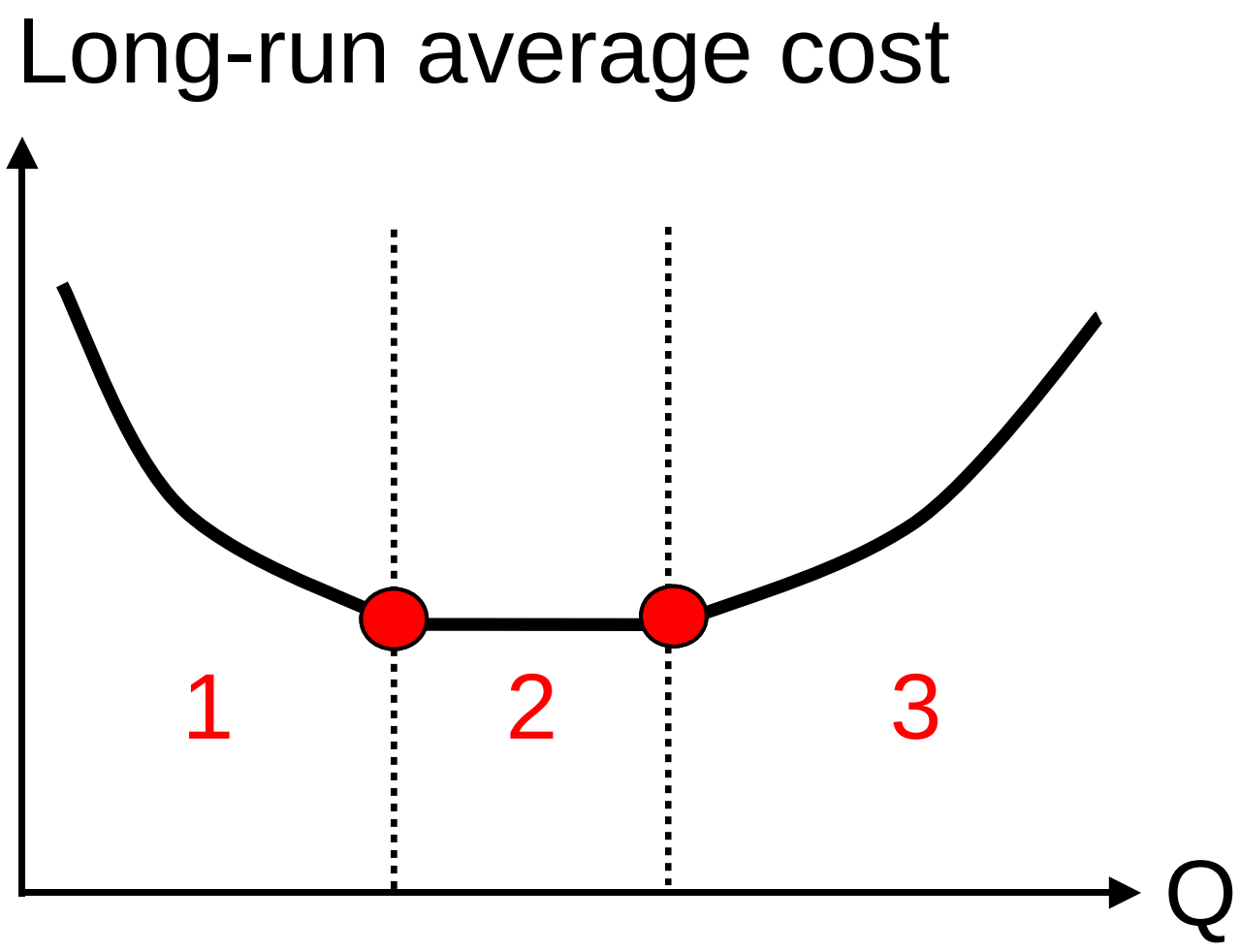
3.7 Returns to scale



1 **Increasing** returns to scale
(= economies of scale)
2 **Constant** returns to scale
3 **Decreasing** returns to scale
(= diseconomies of scale)

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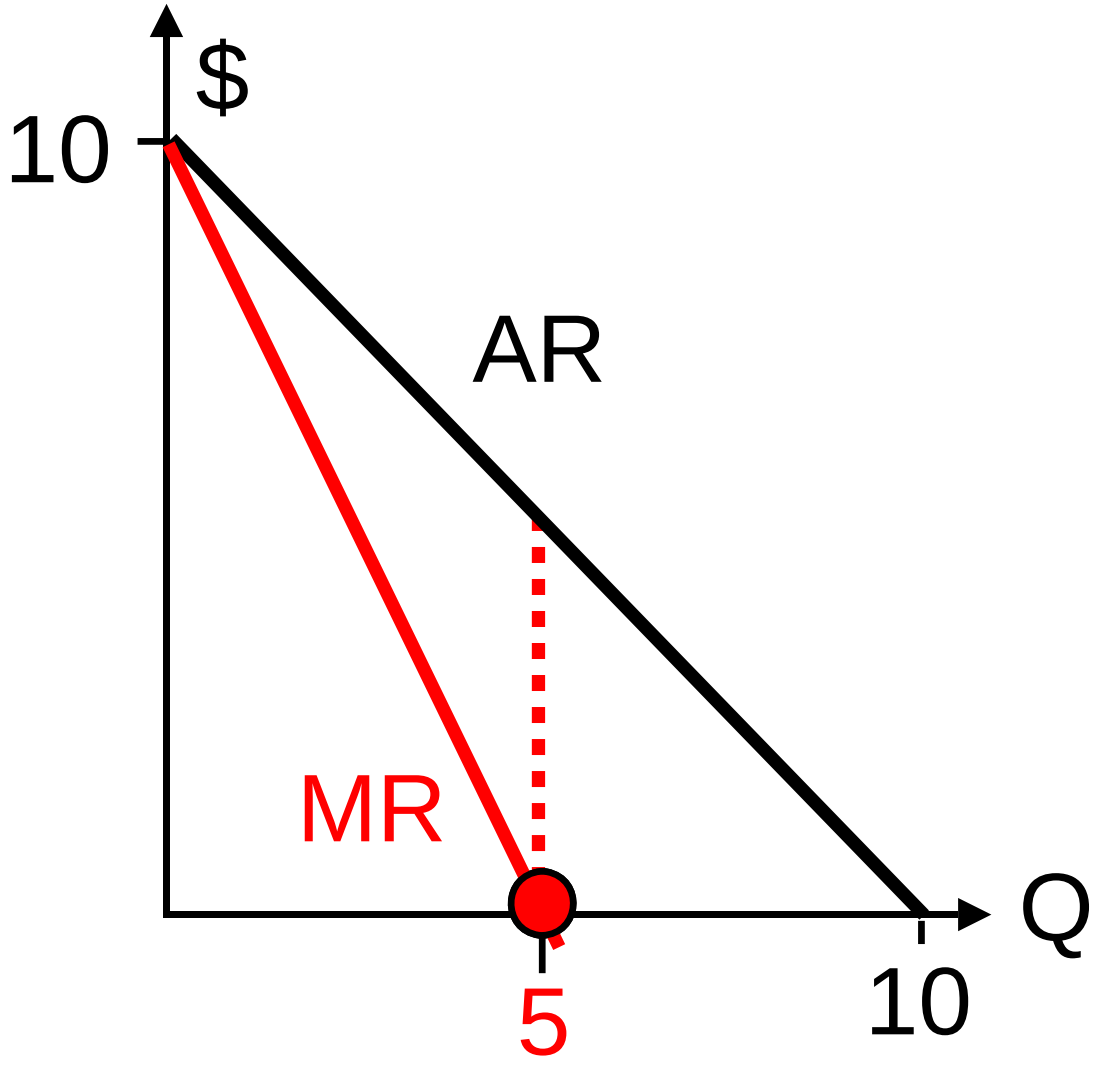
3.8 Average revenue and marginal revenue



From average to marginal revenue:

- **AR** = 10 - Q
- **MR** relates to **changes in TR**, hence (by a bit of calculus):
  - -- TR = AR * Q = 10Q - Q^2
  - -- MR = (TR)' = 10 - 2Q

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3.9 Profit and loss (rules)

① **Marginal** condition:

MC = MR

+

② **Average** condition:

- **Maximum** profit: AC **<** AR
- **Minimum** loss: AC **>** AR
- **Normal** profit: AC **=** AR

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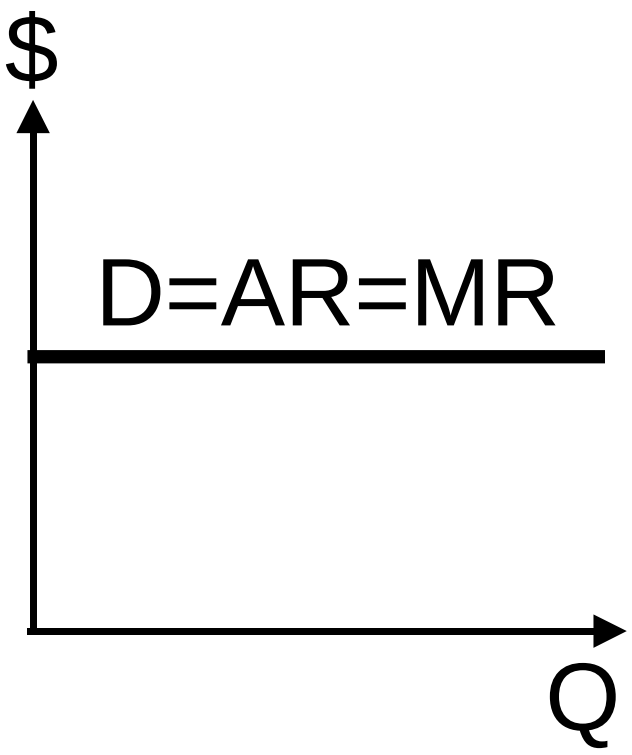
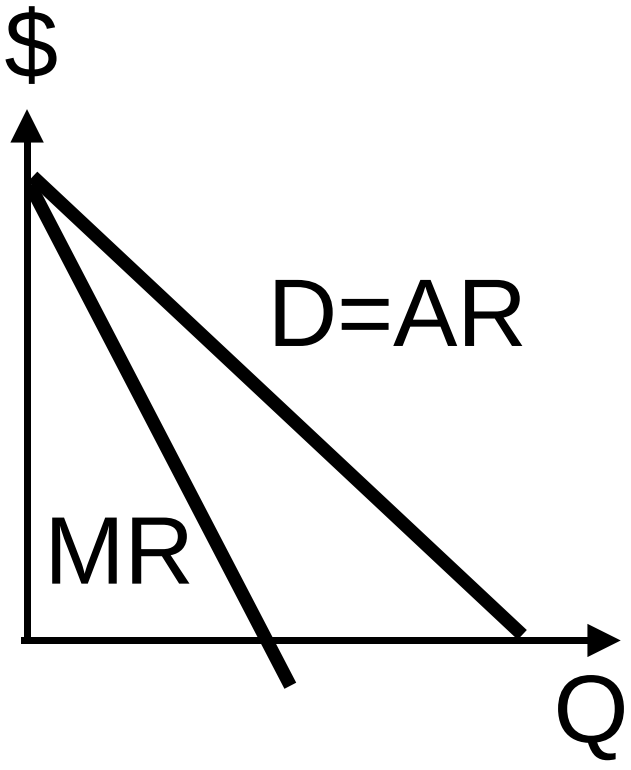
4.1 Demand and market structure

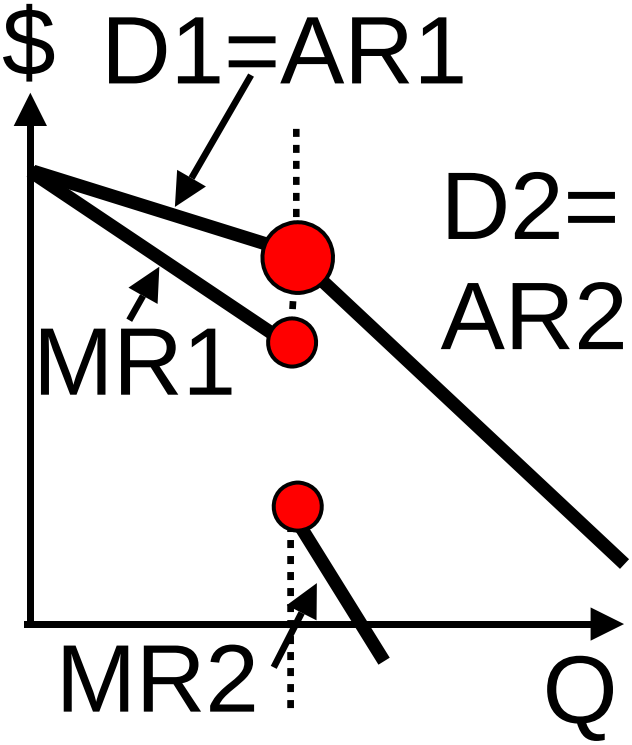
Competition



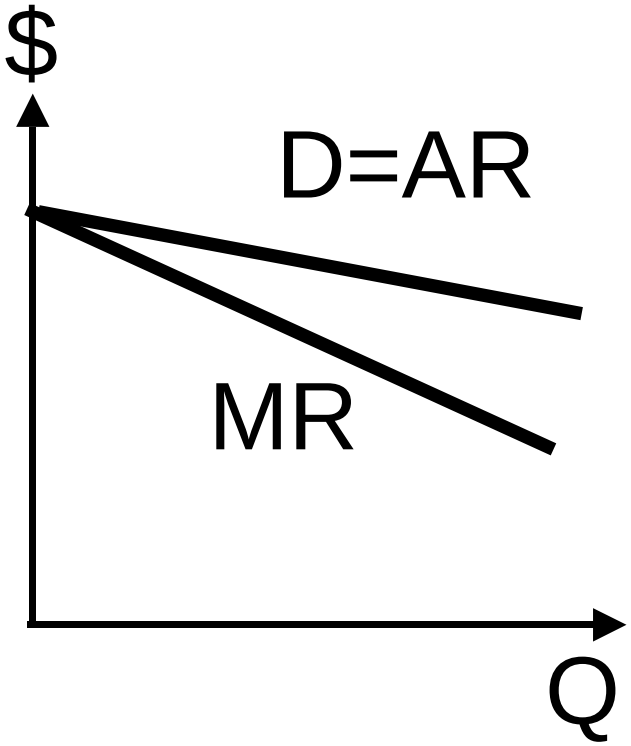
Monopoly



Oligopoly



Monopolistic competition



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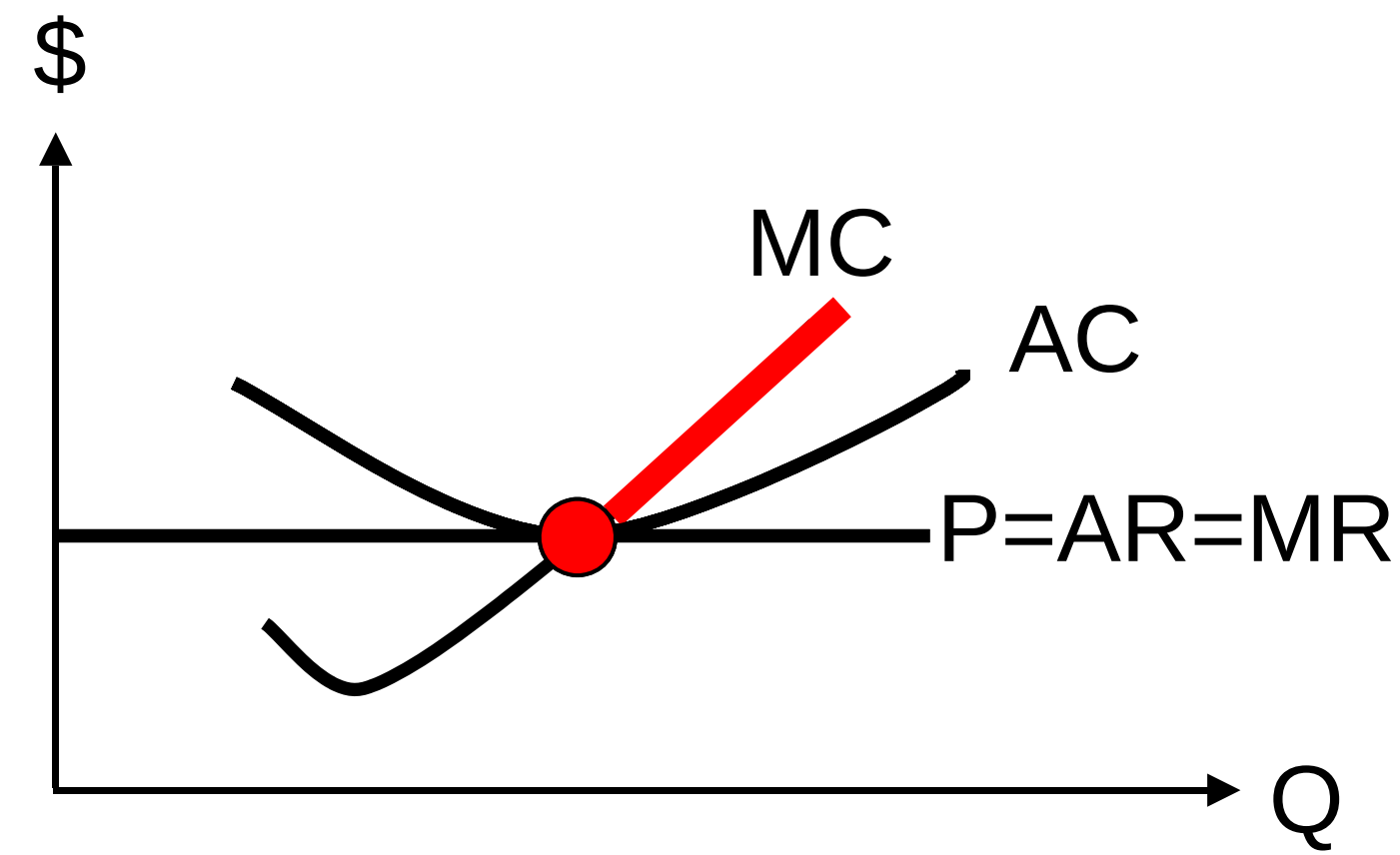
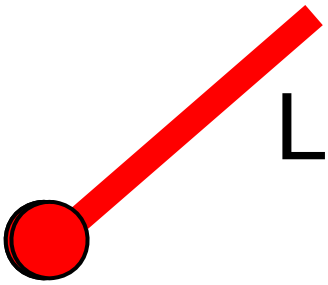
4.2 Competitive firm (long-run)

- The competitive firm is a price-taker, hence the price is given.
- All costs are variable.
- P = AC; if not, exit or entry.
  A normal profit is part of AC.
- **Long-run equilibrium:**





Long-run supply curve

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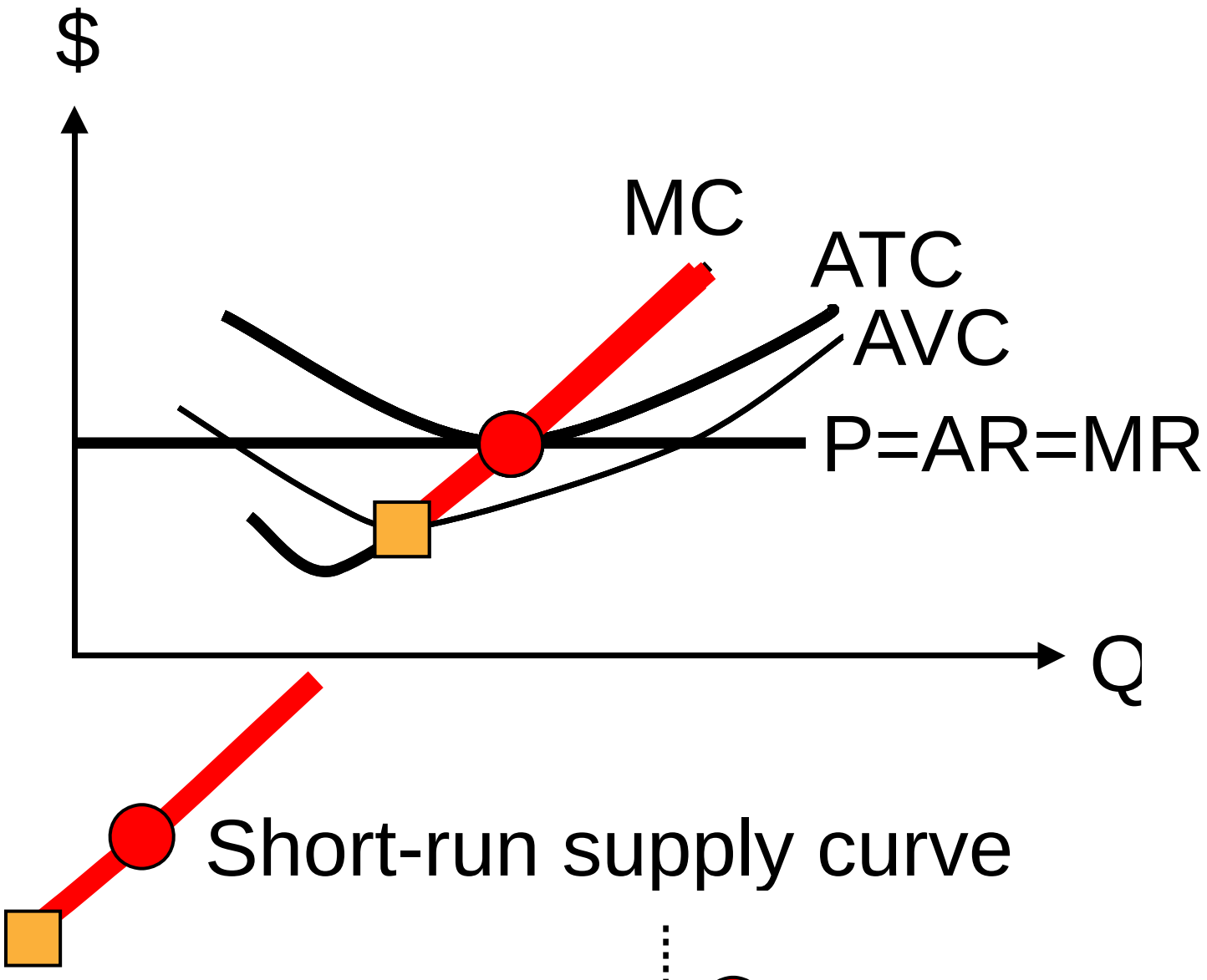
4.3 Competitive firm (short-run)

- The competitive firm is a price-taker, hence the price is given.
- There are fixed and variable costs.
- **Short-run equilibrium:**



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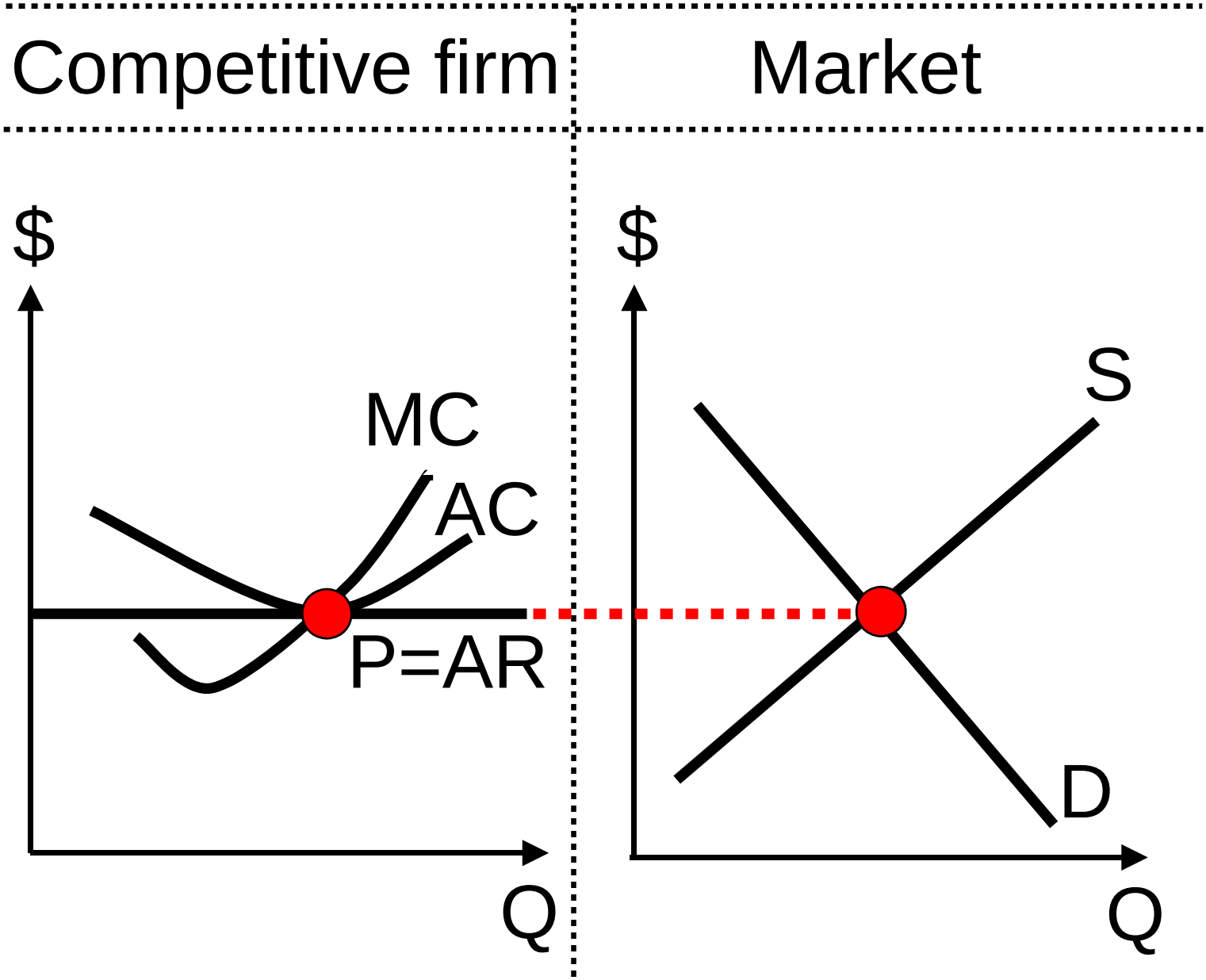
4.4 Competitive firm and market

A competitive firm is a price-taker. It chooses Q to maximize profit or minimize loss. Normal profits are part of AC.

Long-run equilibrium:



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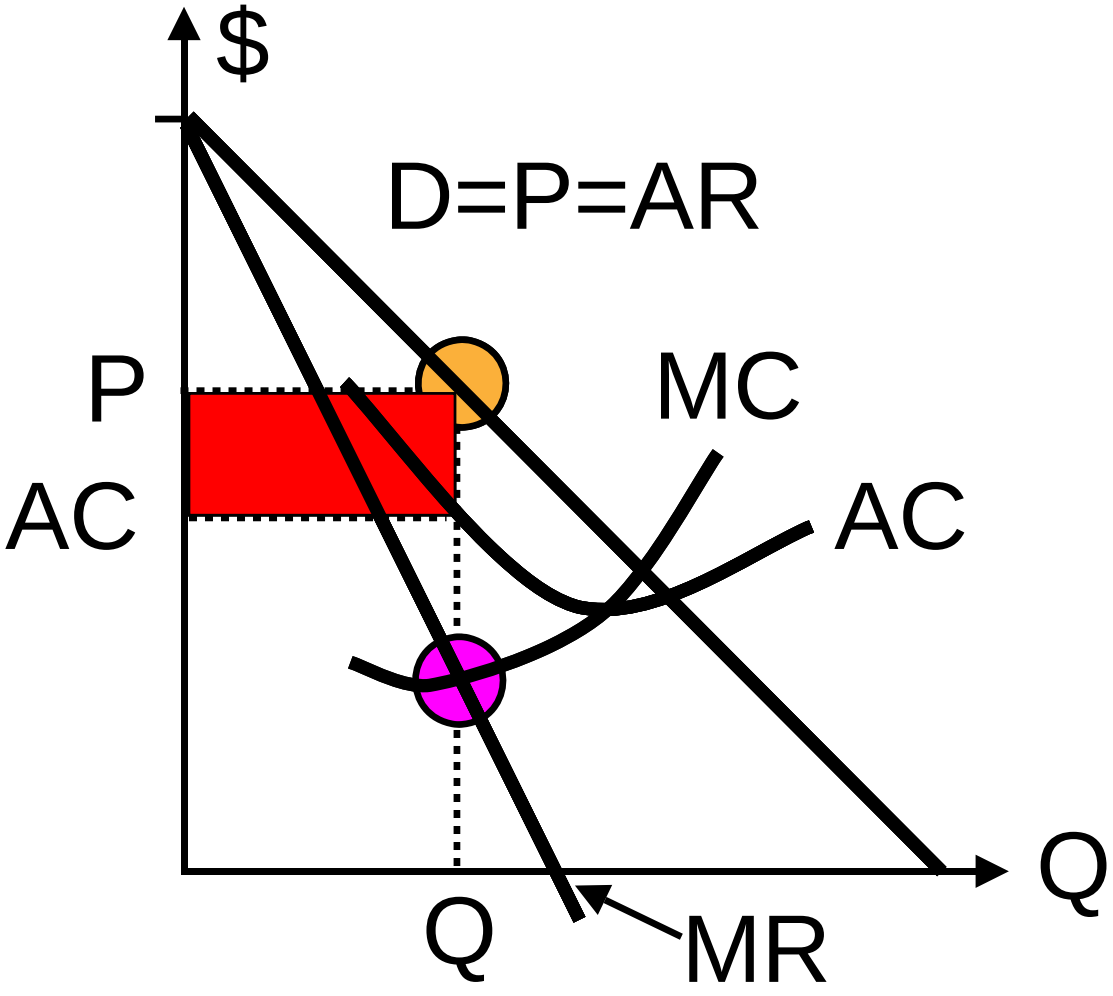
4.5 Profit maximization by a monopolist



Profit maximization by a monopolist in 3 steps:

- Find point MC = MR
- Set price > MC = MR
- Profit = (P - AC) * Q

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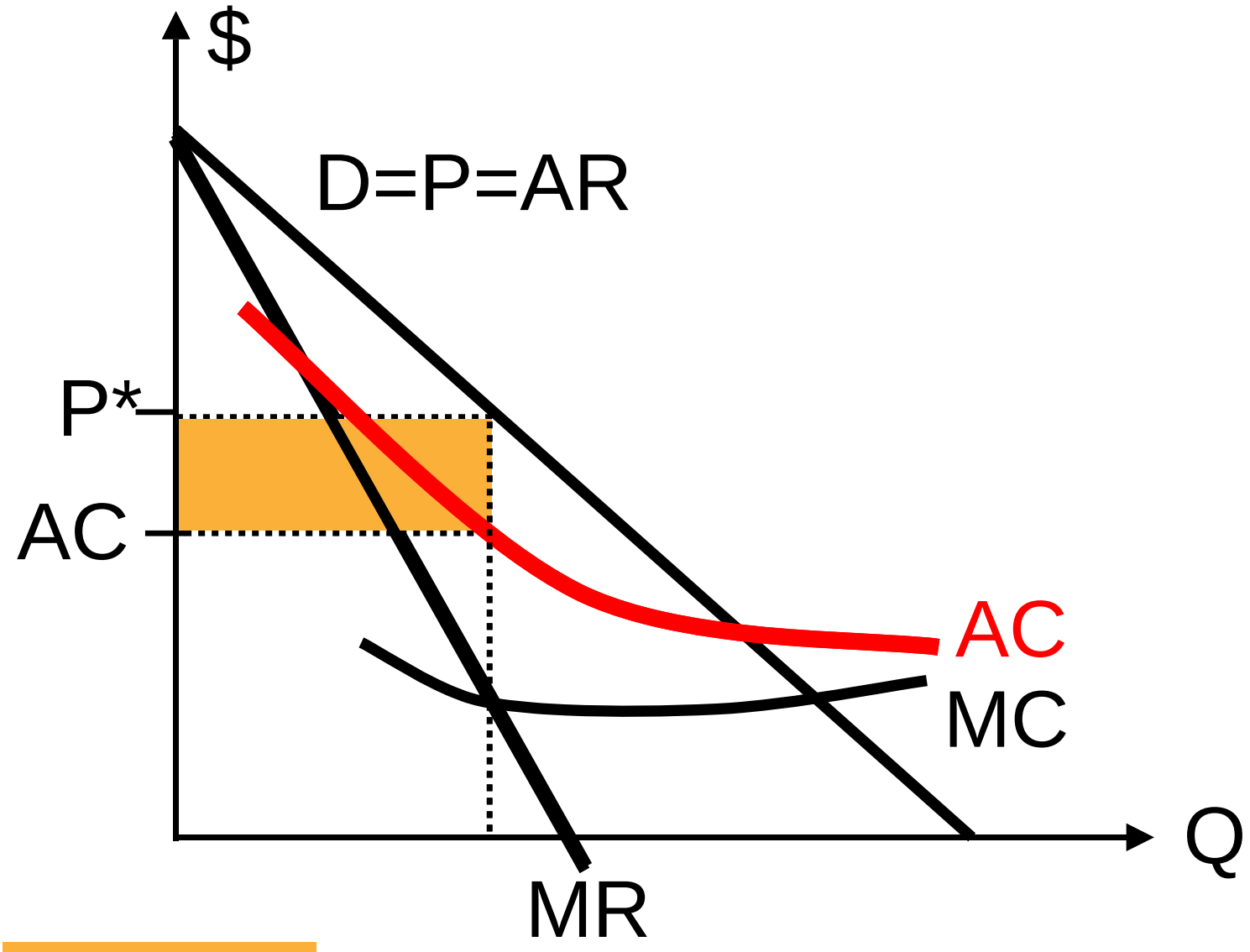
4.6 Natural monopoly

Due to cost advantages (falling AC/economies of scale) **natural monopolies** have a strong market position. Example: A firm investing in infrastructure (high fixed cost)



Supernormal profit

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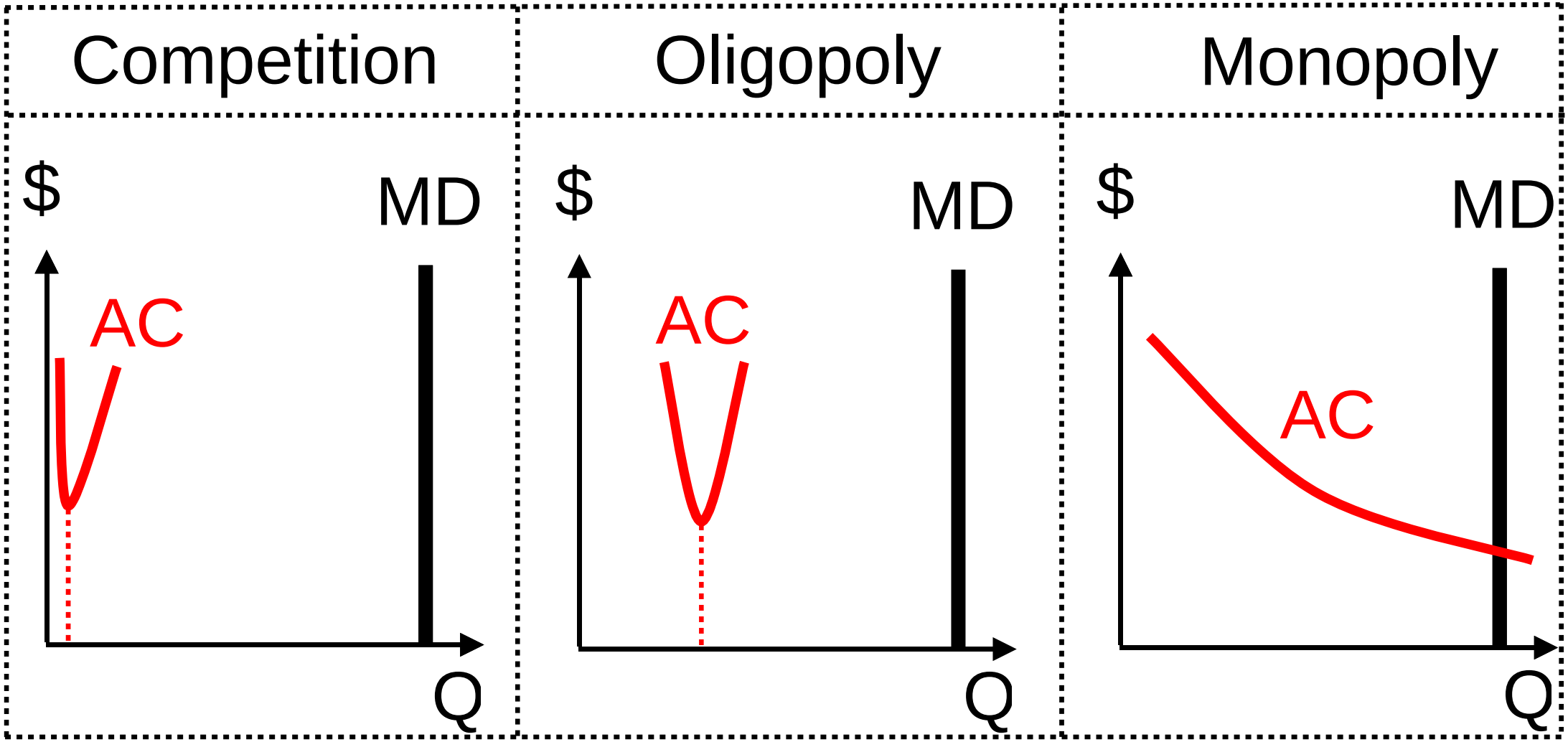
4.7 Cost and market structure



AC = Average cost of a firm

MD = Market demand

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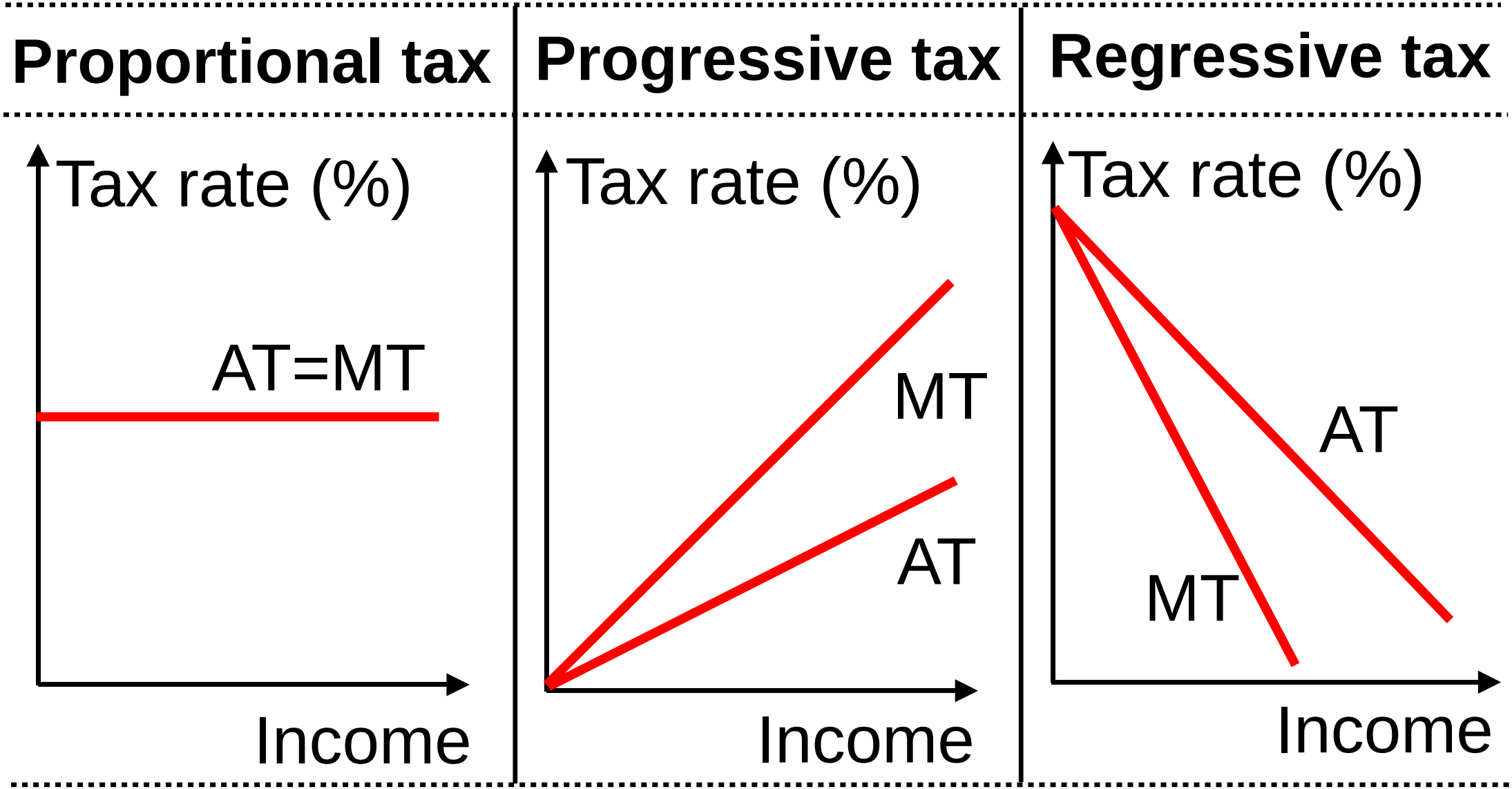
5.1 Income tax (proportional, progressive, regressive)



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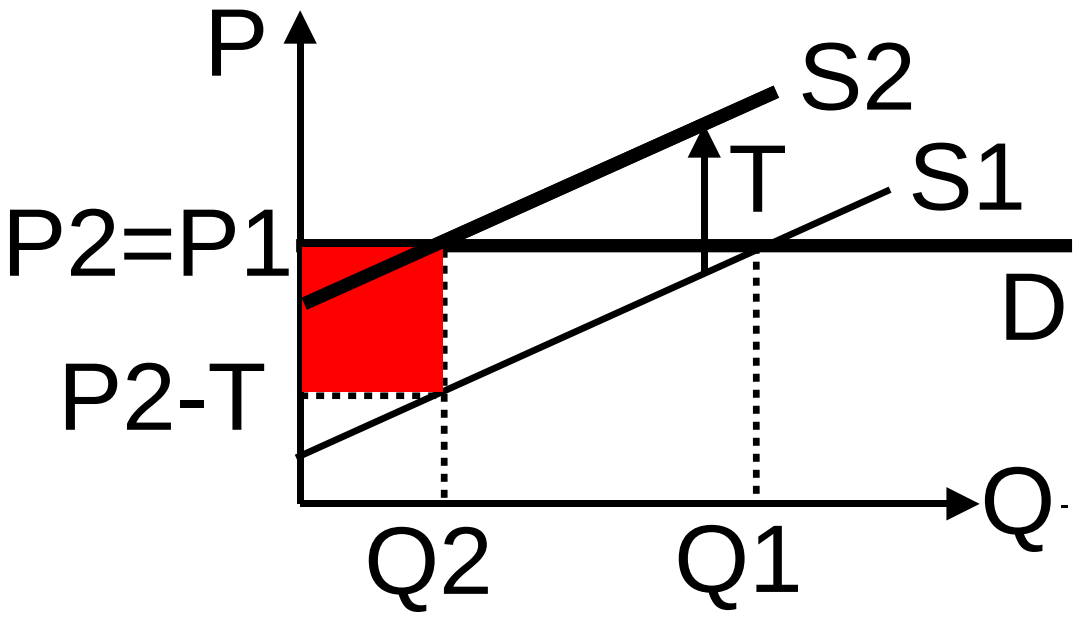
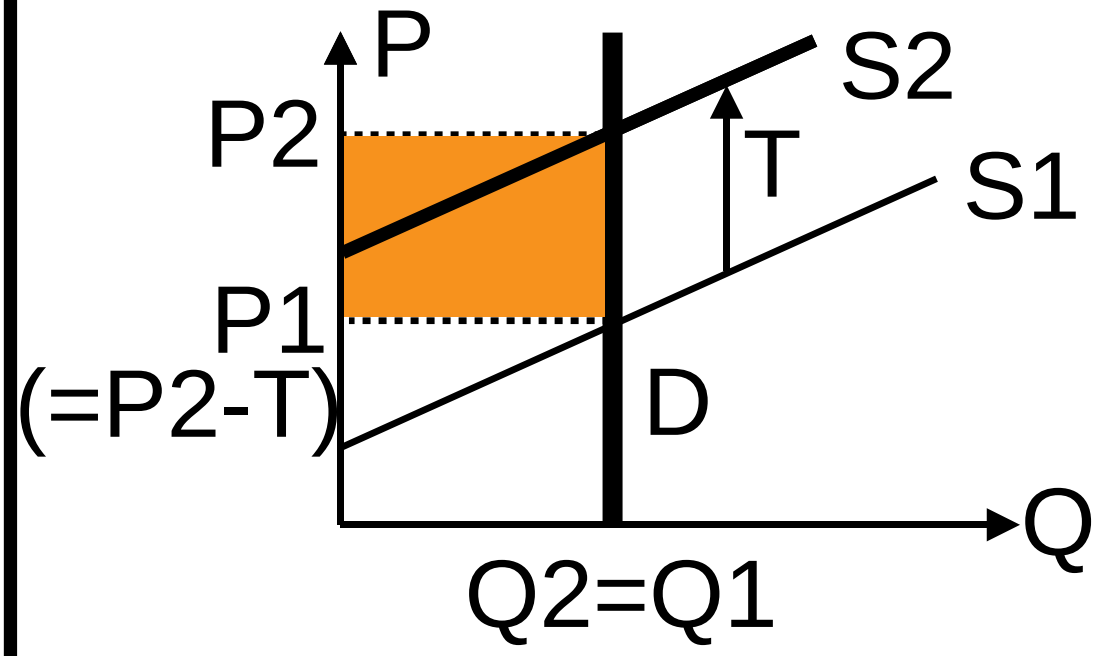
5.2 Tax incidence 1 (extreme cases)

e = infinite



Tax is borne completely by the **seller.**

e = 0



Tax is borne completely by the **buyer**.

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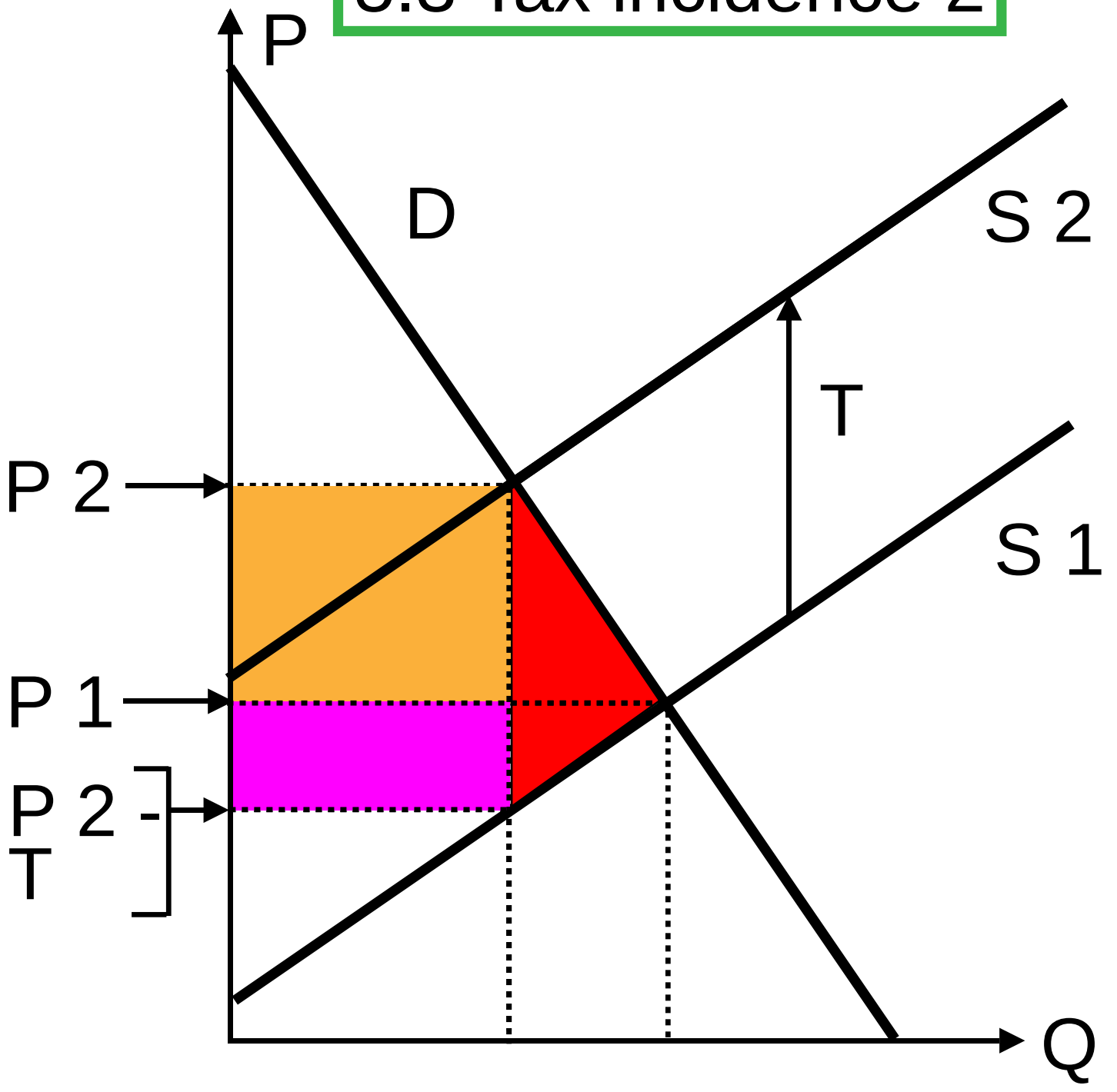
5.3 Tax incidence 2



tax borne by buyers

tax borne by sellers

dead-weight loss

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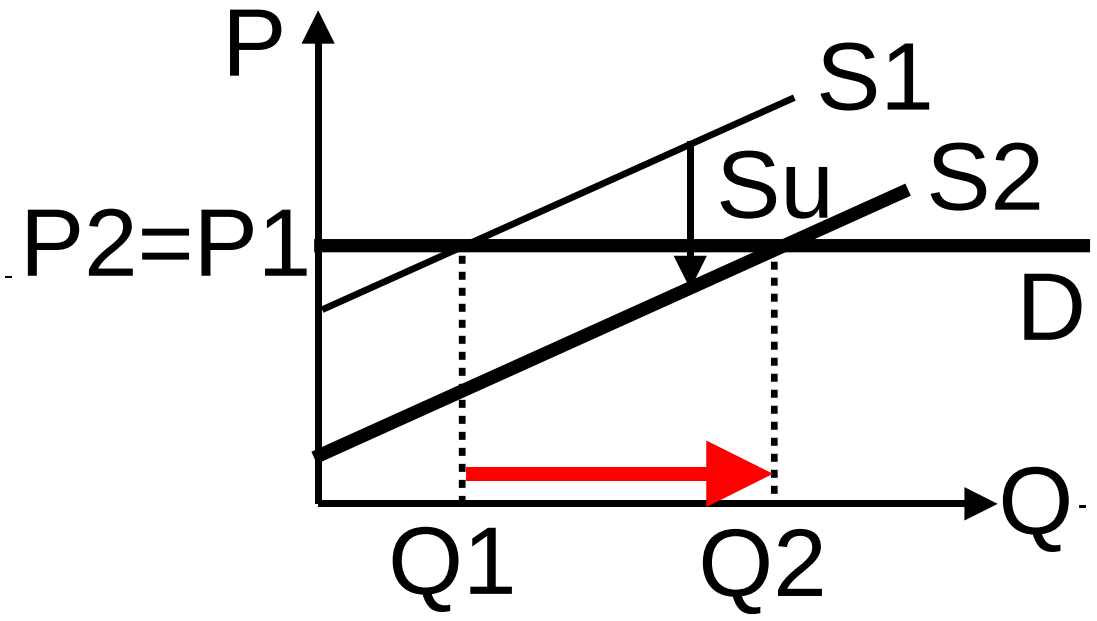
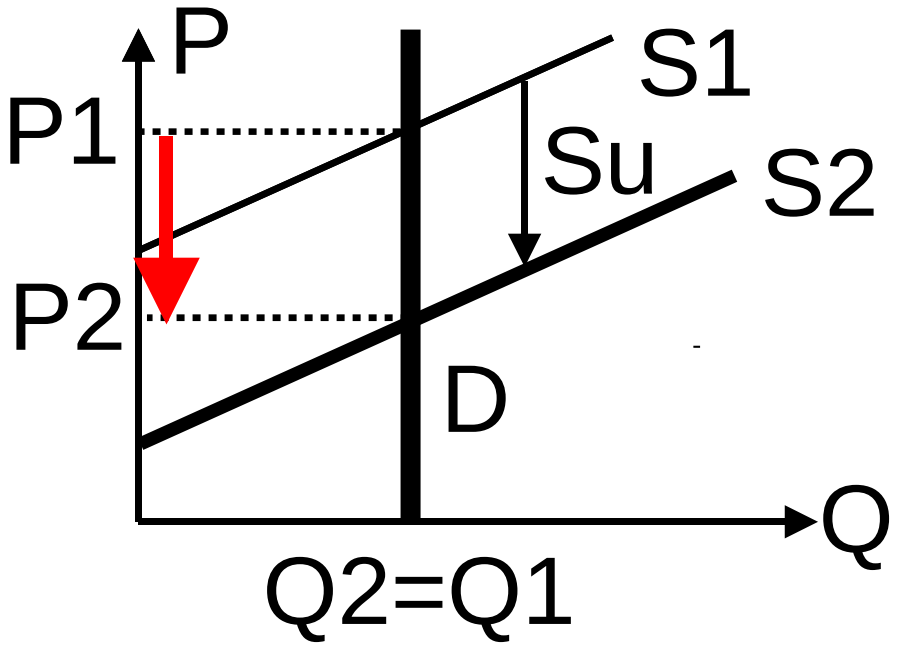
5.4 Subsidies 1 (extreme cases)

e = infinite



- **Price un**changed;
- **Quantity rises** from Q1 to Q2.

e = 0



- **Quantity un**changed;
- **Price falls** from P1 to P2.

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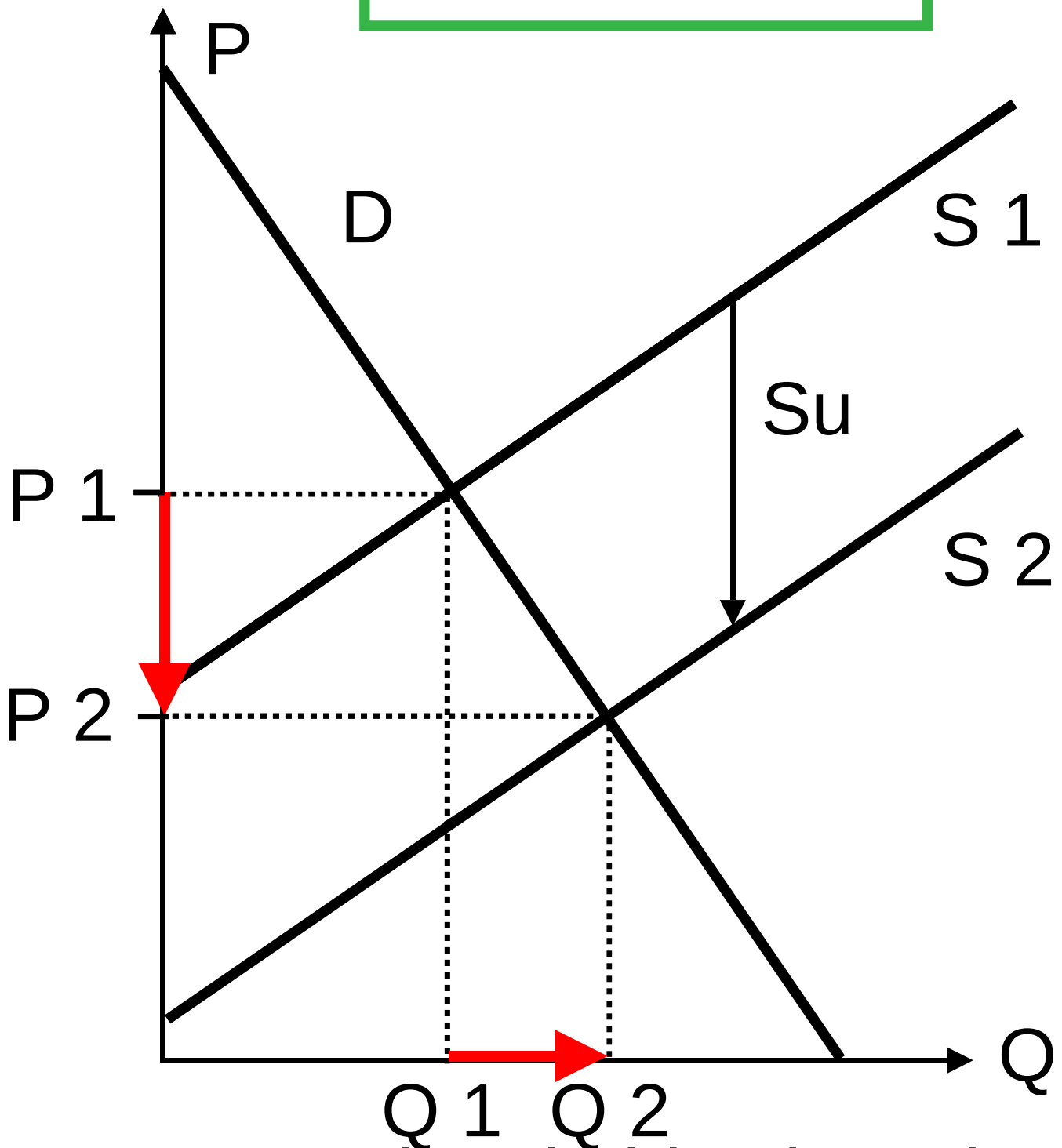
5.5 Subsidies 2



By a per-unit subsidy, the price decreases and the quantity increases. In this case, both sellers and buyers profit from the subsidy at the cost of taxpayers.

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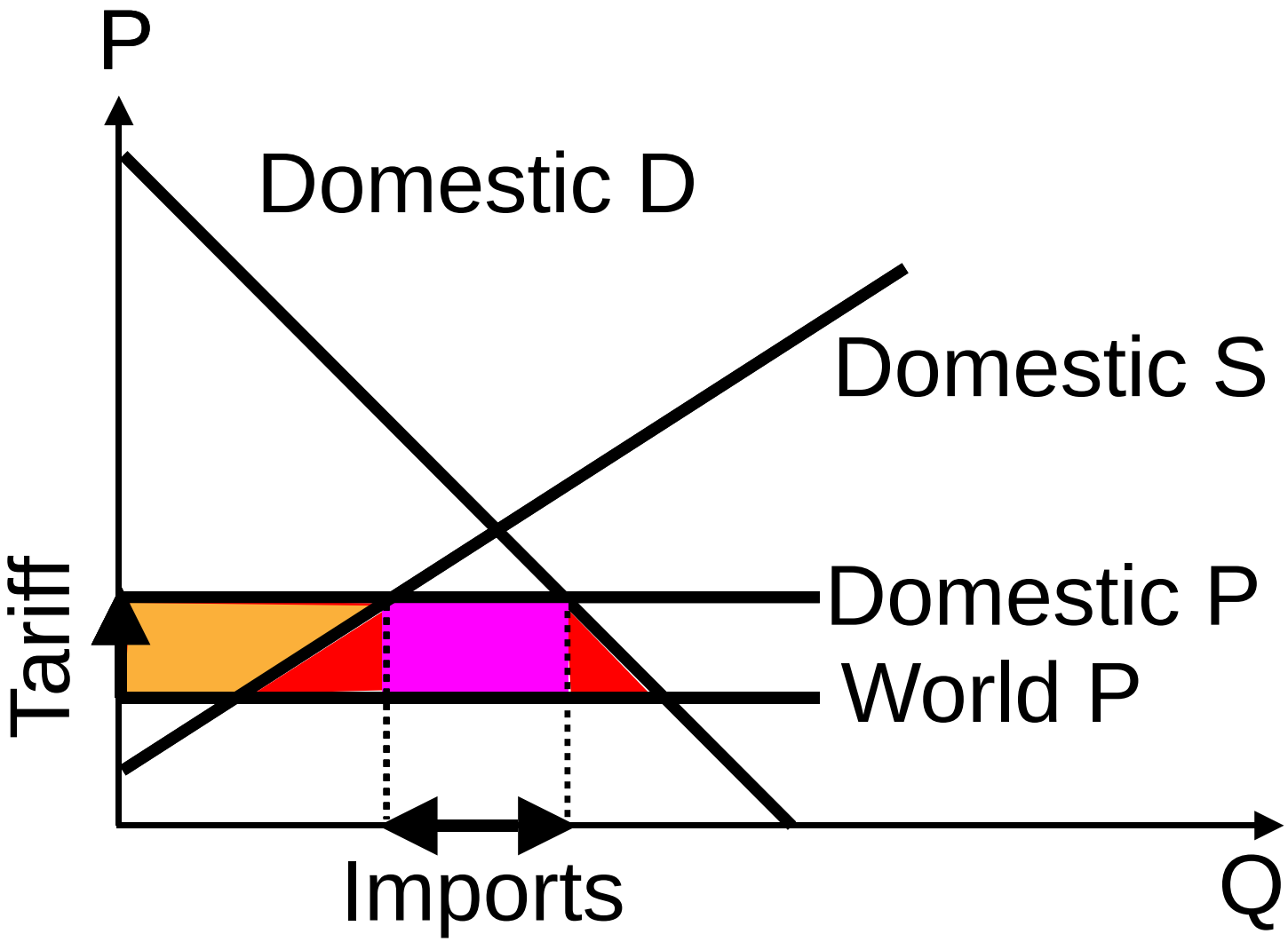
5.6 Import tariff (impacts)



Impacts of an import tariff:

Producer surplus ↑

Tariff revenues

Welfare losses

Consumer surplus ↓

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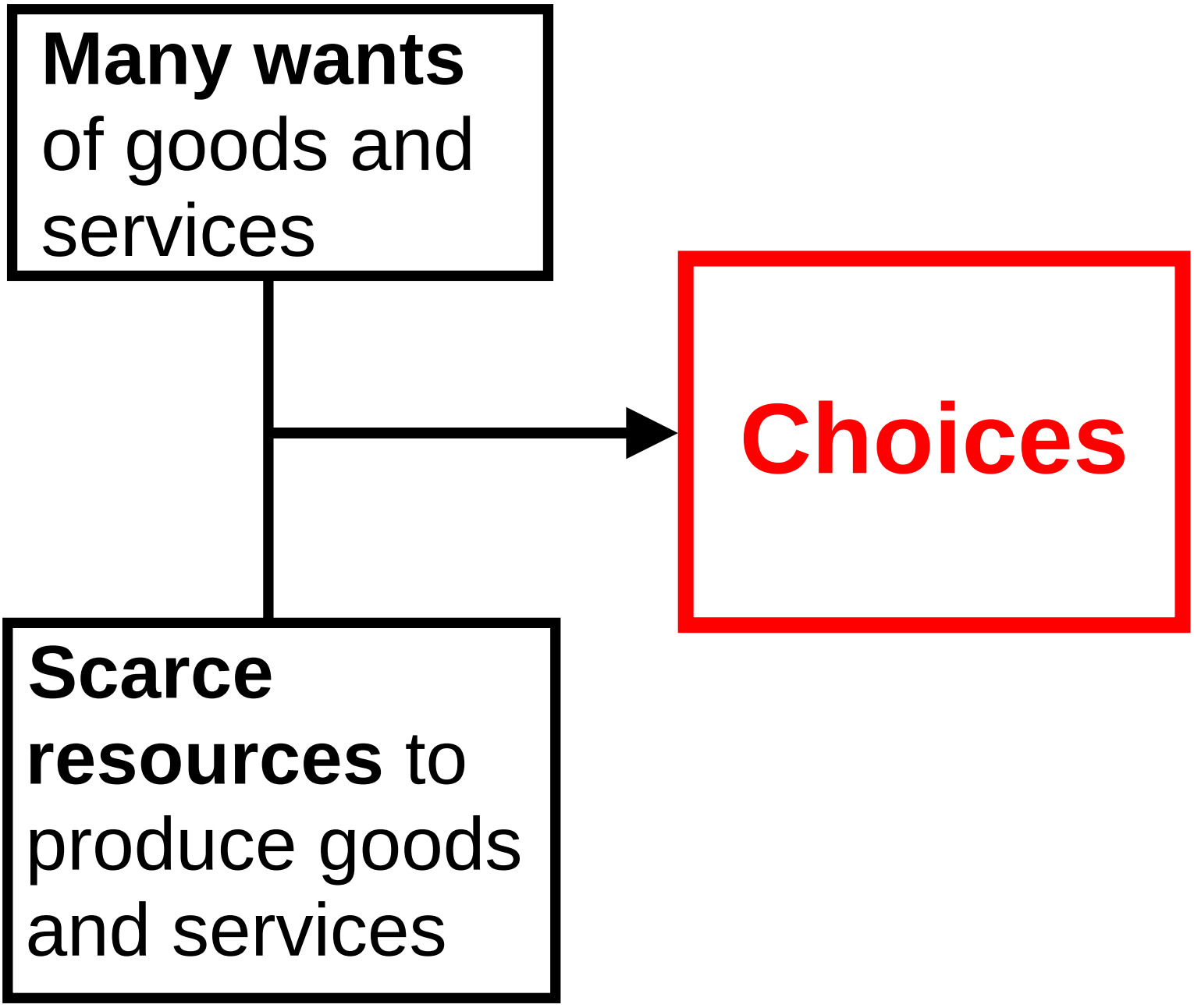
6.1 Economic problem



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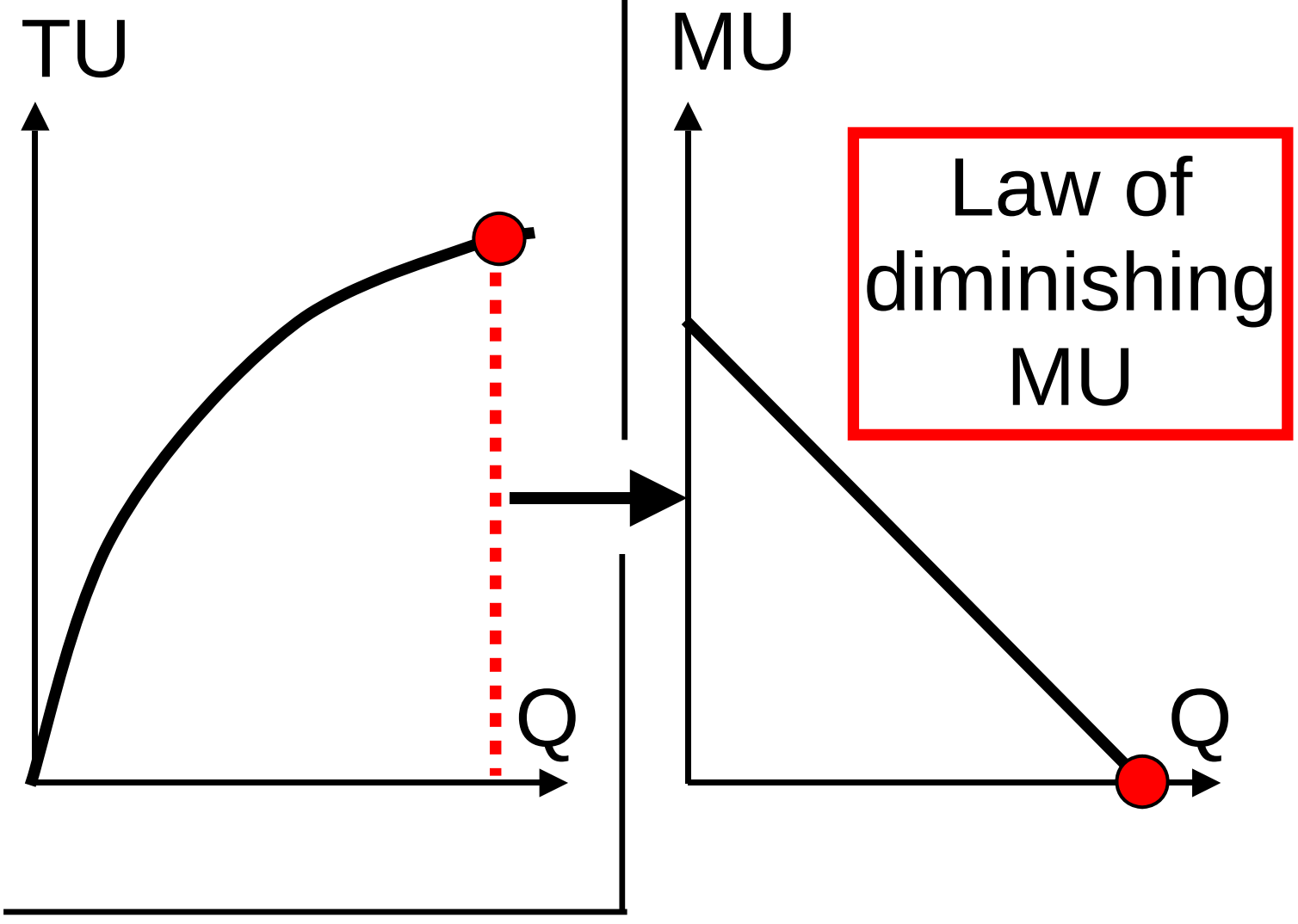
6.2 Utility

Total utility

Marginal utility



Consumption **equilibrium:**

$$\frac{\text{MU good A}}{\text{P good A}} = \frac{\text{MU good B}}{\text{P good B}}$$

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6.3 Ceteris paribus

- Ceteris paribus means '**other things being equal**' (constant).

- By this assumption, **causal relationships** are possible: If A occurs, then B follows.

- Example: If the price rises, quantity demanded falls.
  Other things being equal, such as income, prices of other goods, tastes, number of buyers.
  If other things change, the demand curve **shifts**. If 'only' price changes, we **move along the demand curve**.

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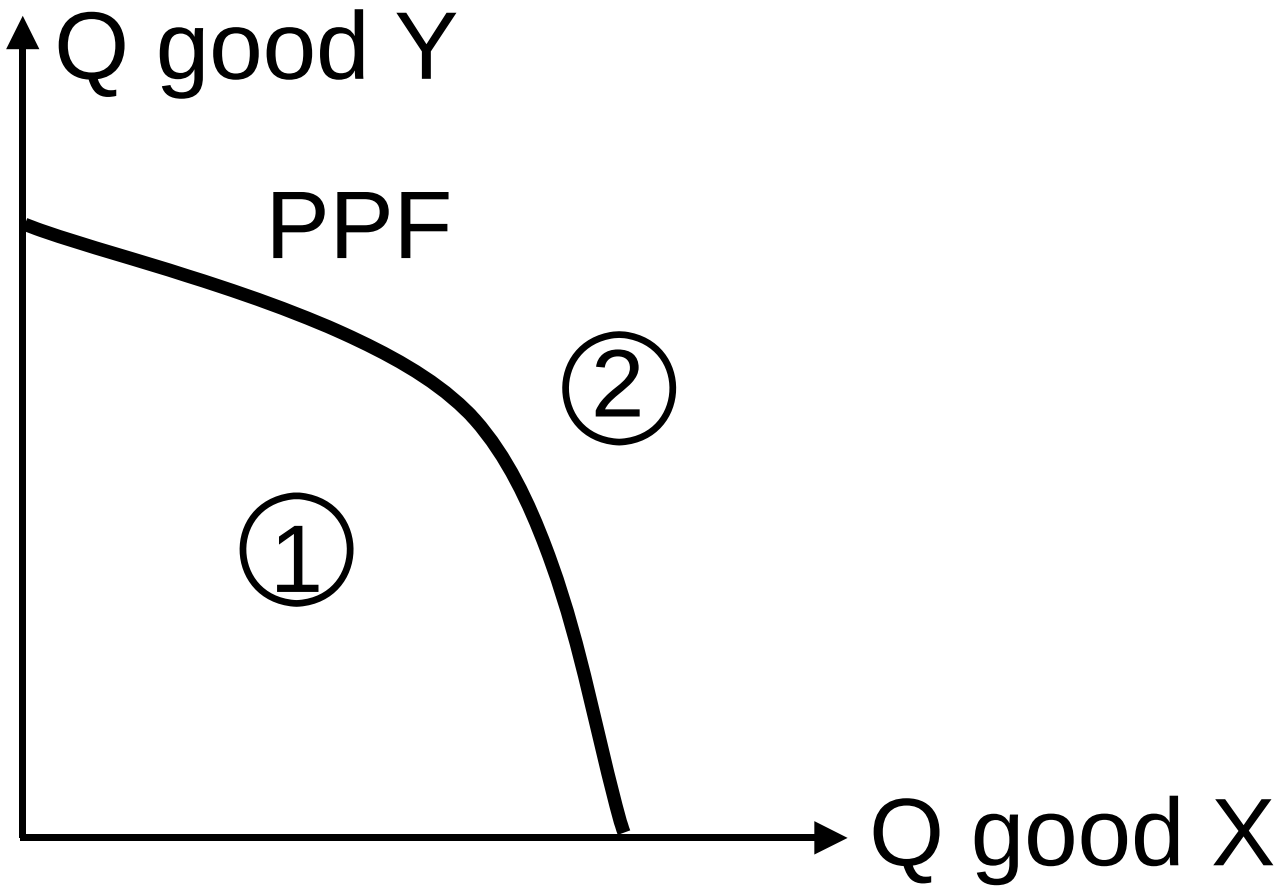
6.4 Production possibilities frontier



Characteristics:

- **Concave** shape of PPF: Opportunity costs are rising when substituting more and more X for Y.
- Points on the PPF are **efficient**.

  Other points:

  ① inefficient

  ② unattainable

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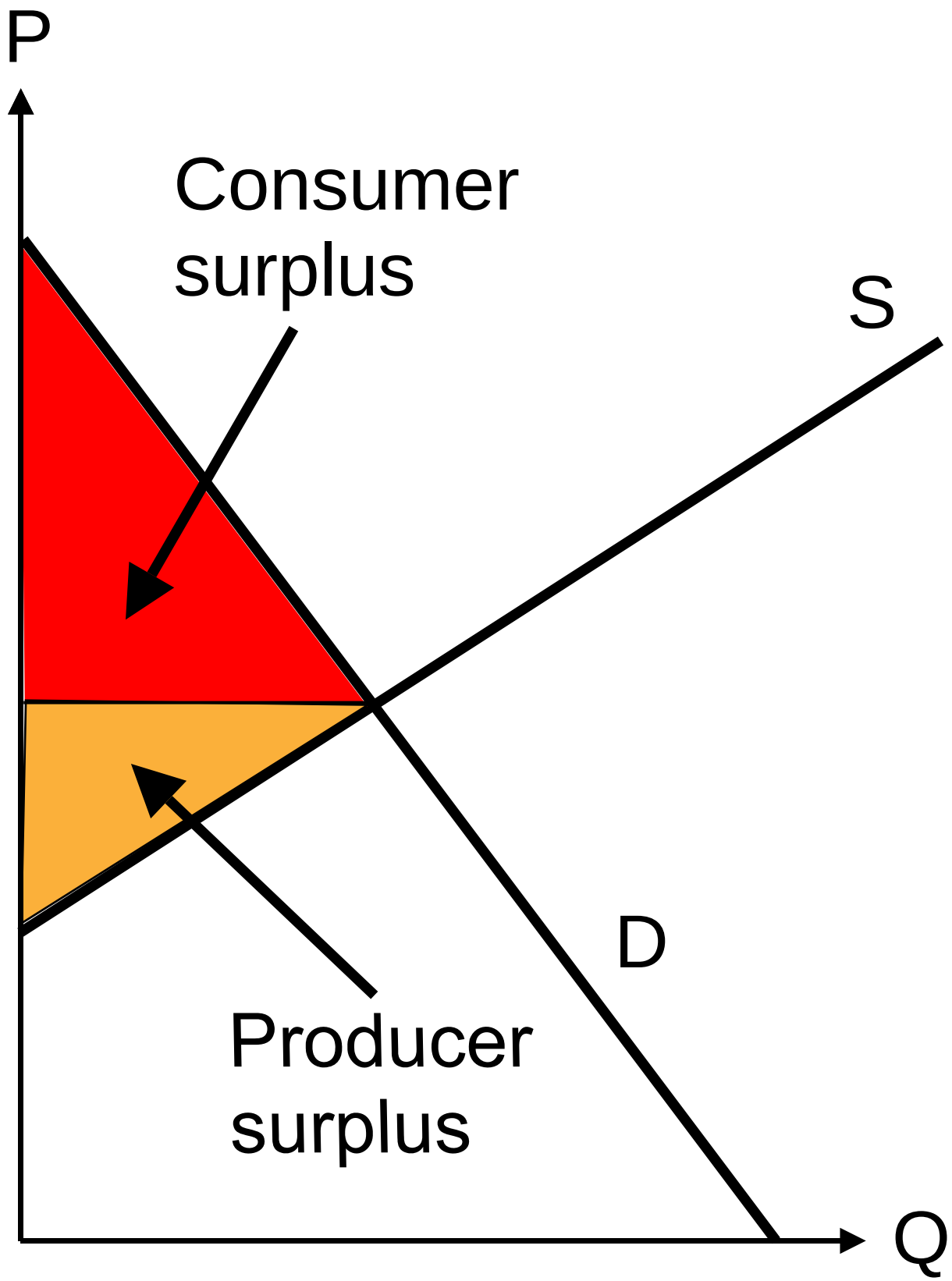
6.5 Consumer surplus and producer surplus



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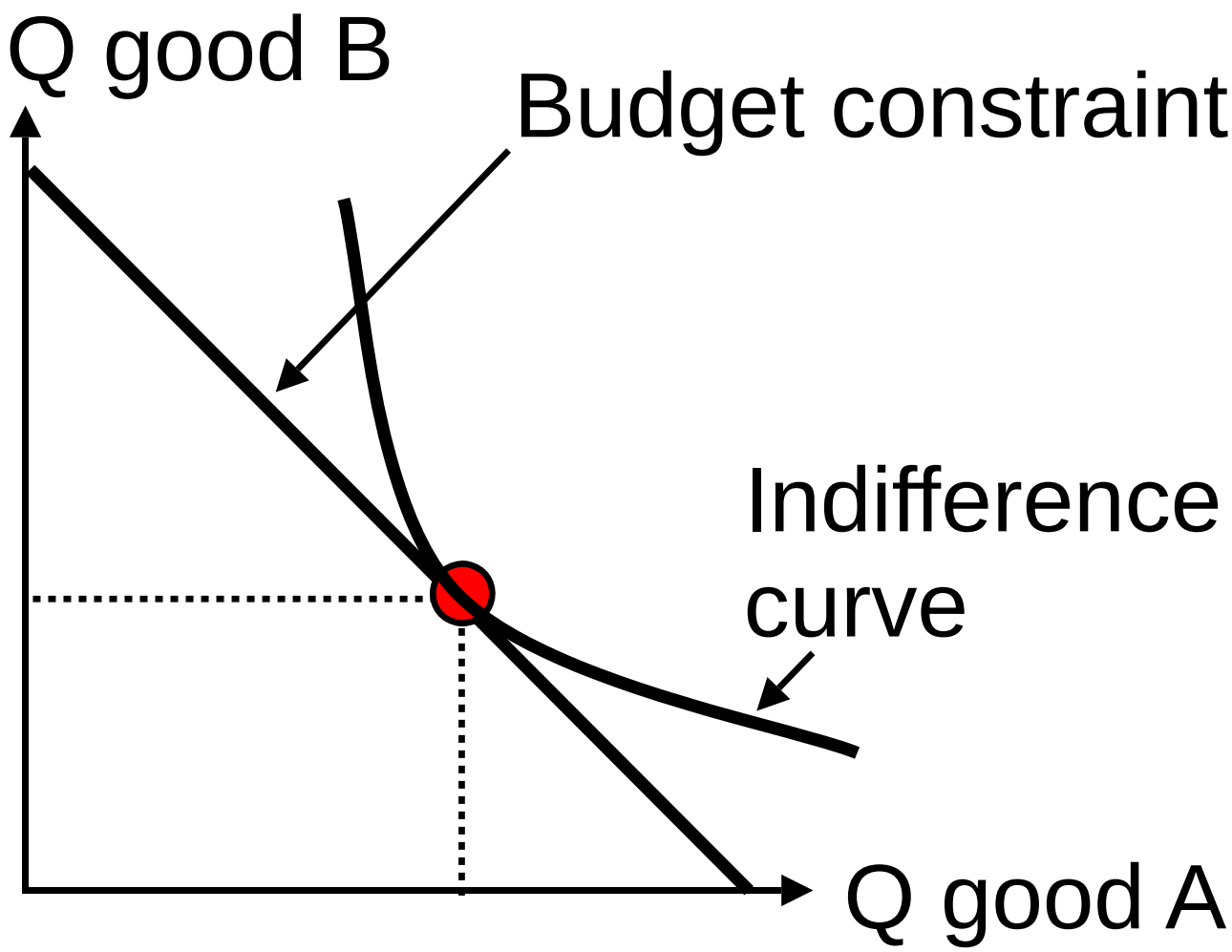
6.6 Consumer choice



Characteristics of the optimum:

- The budget constraint touches the highest indifference curve.
- Hence the slope of the in-difference curve is equal to the slope of the budget constraint.

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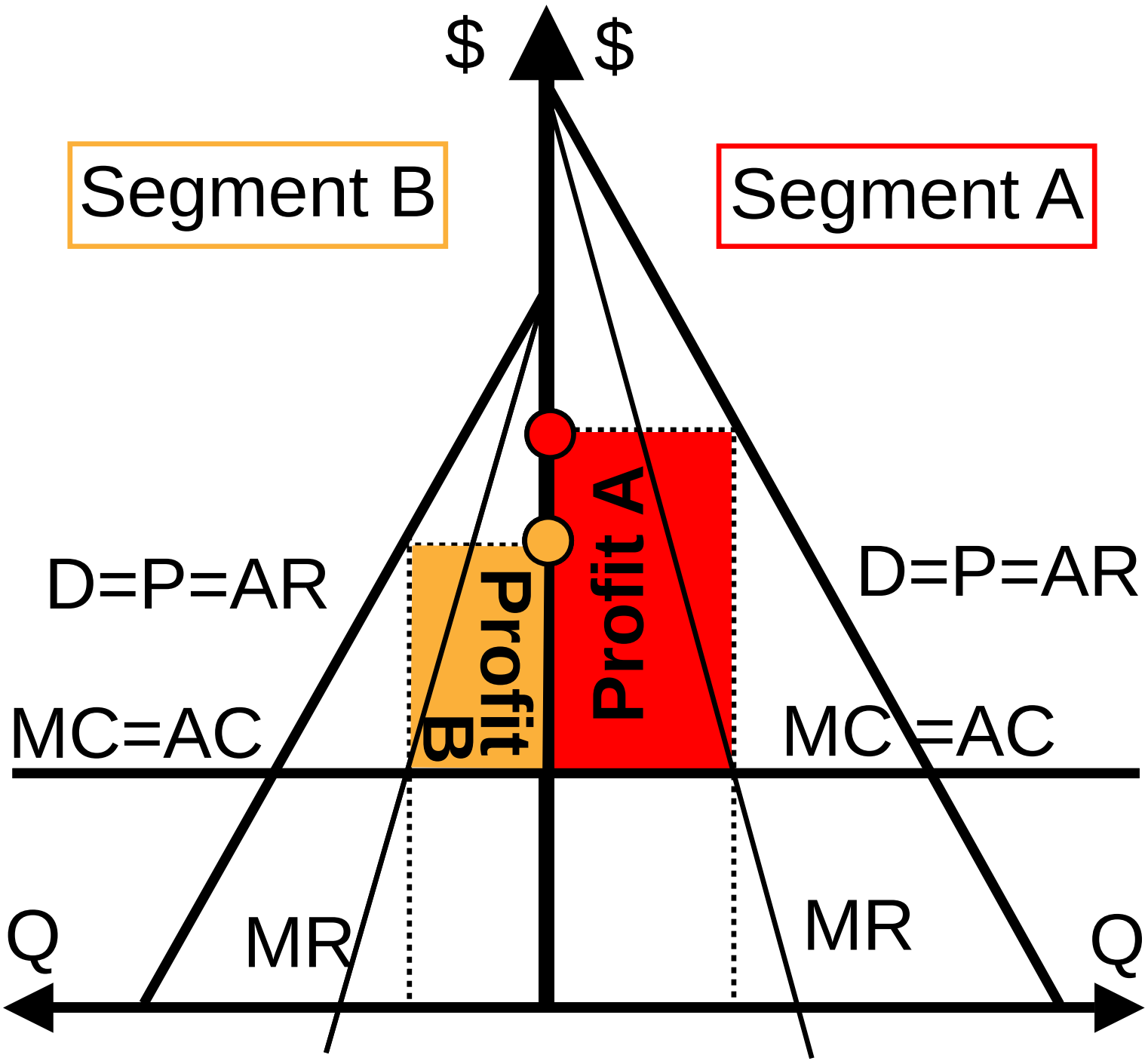
6.7 Price discrimination



Price in segment A

Price in segment B

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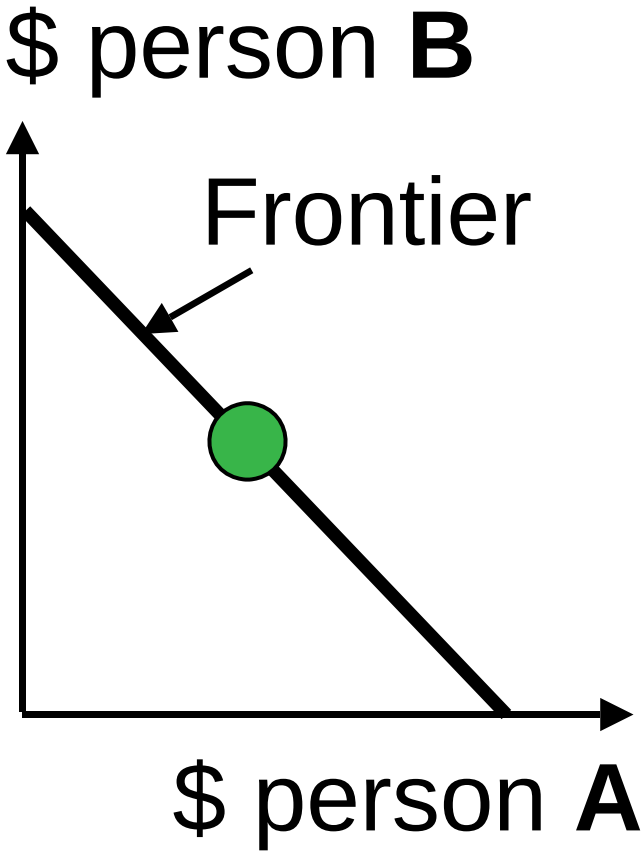
6.8 Pareto efficiency

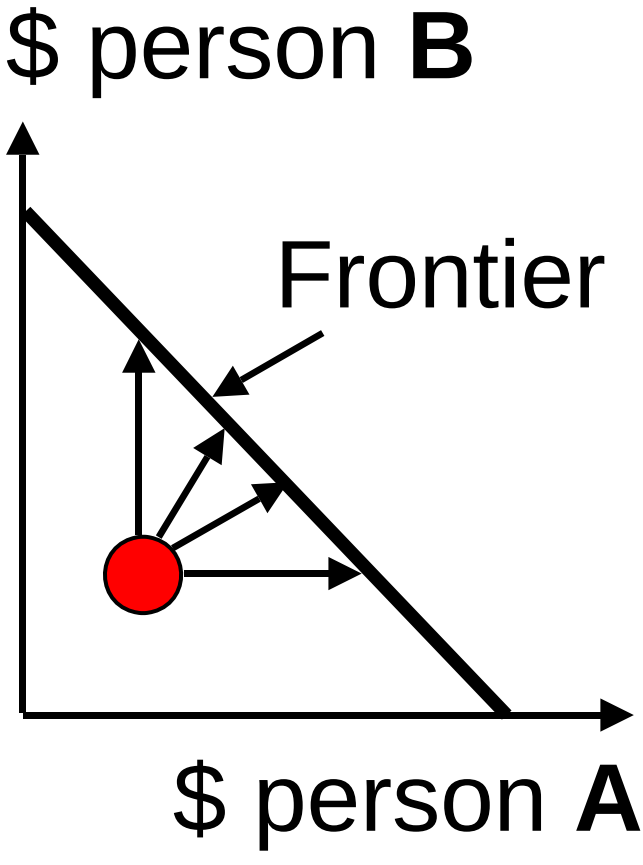
'Pareto efficient' means that it is impossible to make one person better off without making another one worse off.

Pareto efficient

inefficient

Example: Distribution of wealth between 2 persons





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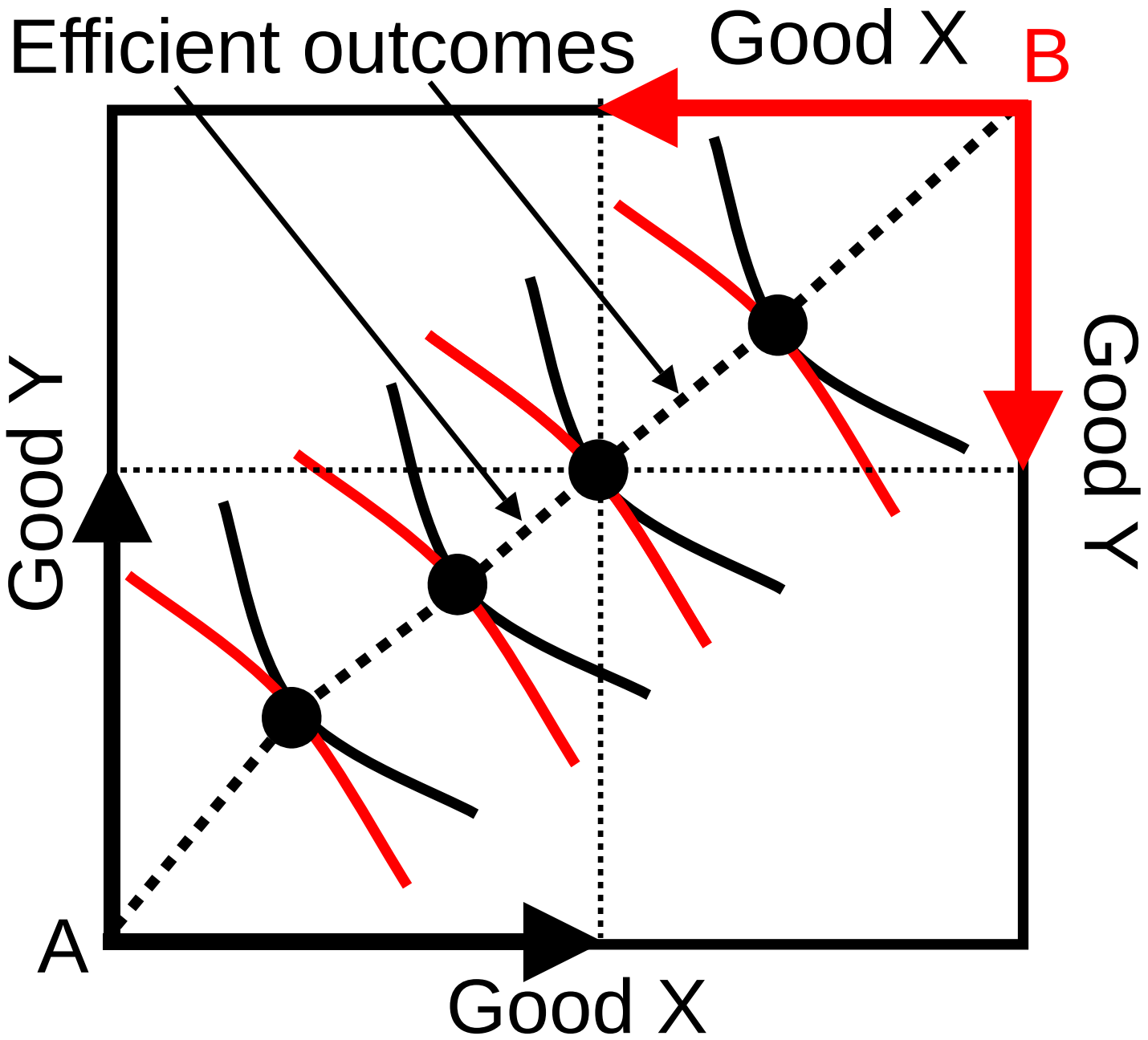
6.9 Edgeworth box

- 2 consumers, A and B
- 2 goods, X and Y
- Combination of 2 indifference curve maps of A and B

Contract curve -------:
Efficient outcomes



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