# 180.101 Elements of Macroeconomics - TA Section

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# Logistics

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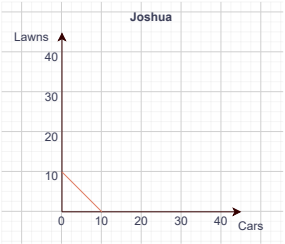
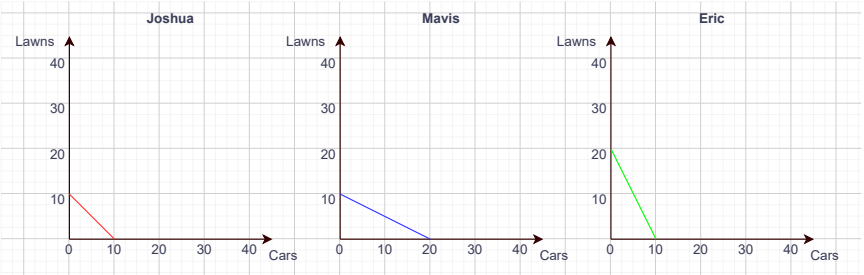
# Production possibility frontier (PPF)

- **PPF**: a curve showing the **maximum attainable combinations** of two goods that can be produced with available resources and current technology
- Joshua: total resources = 10 hours, can produce a combination of two services (lawns & cars).
- **Opportunity cost** of doing X (giving up Y) = $\left|\frac{\Delta Y}{\Delta X}\right|$
- |Slope| of PPF = Opportunity cost of producing the service on the *horizontal* axis, measured by the units of the service on the *vertical* axis



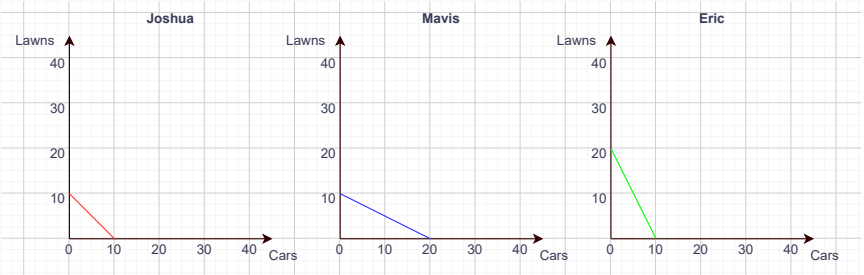
# Absolute advantage

- A can produce a good **more productively** than B
  - Production of "mowing lawns" service: Eric > Maris = Joshua
  - Production of "washing cars" service: Mavis > Joshua = Eric



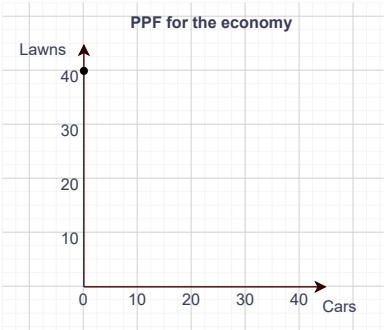
# Comparative advantage

- A can produce a good **at lower opportunity cost** than B
- Opportunity cost of wash one more cars
  ⇒ Joshua: 1 less lawns mowed  Mavis: 0.5  Eric: 2
  ⇒ Mavis has comparative advantage in washing cars over Joshua and Eric



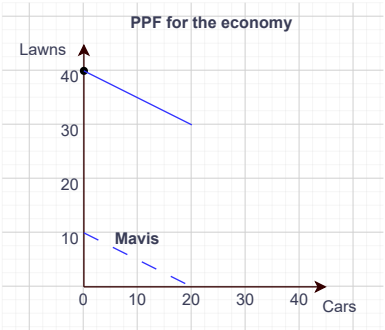
# PPF for the economy

- Opportunity cost of washing cars in terms of mowing lawns
  Joshua: 1  Mavis: 0.5  Eric: 2
- Start from the point where all three spend all their time mowing lawns



# PPF for the economy

- Opportunity cost of washing cars in terms of mowing lawns
  Joshua: 1  Mavis: 0.5  Eric: 2
- First, let Mavis wash cars instead of mowing lawns because he has the lowest opportunity cost
- Note: Mavis only has 10 hours!



# PPF for the economy

- Opportunity cost of washing cars in terms of mowing lawns
  Joshua: 1  Mavis: 0.5  Eric: 2
- Second, let Joshua (second lowest O.C.) join Mavis to wash cars

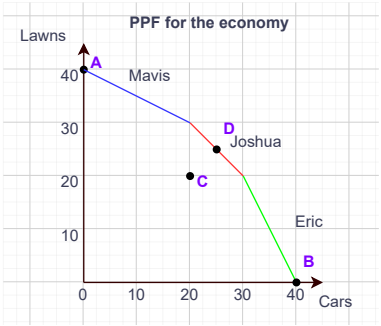
# PPF for the economy

- Opportunity cost of washing cars in terms of mowing lawns
  Joshua: 1  Mavis: 0.5  Eric: 2
- Finally, let Eric join the other two to wash cars, until all three spend all their time washing cars

# PPF for the economy

N countries producing 2 goods (X and Y), linear technology.

1. Start from the point where all countries spend all their resources producing Y
2. Among the Y-producers, decide who is best in producing X (lowest O.C.)
3. Plot the allocations in which that country gradually switches to producing X while everyone else remains unchanged.
4. Repeat steps 2, 3 until all countries spend all their resources producing X.



# Comparative-cost conditions

- Opportunity cost of apparel in terms of chemical
  China: 1 US: 2
- Opportunity cost of chemical in terms of apparel
  China: 1 US: 0.5
- China has comparative advantage in producing apparel and US in chemical
- China specializes in apparel and US in chemical

China

| | |
|---|---|
| Apparel | 24 |
| Chemical | 6 |

US

| | |
|---|---|
| Apparel | 4 |
| Chemical | 12 |

**Specialization**

China

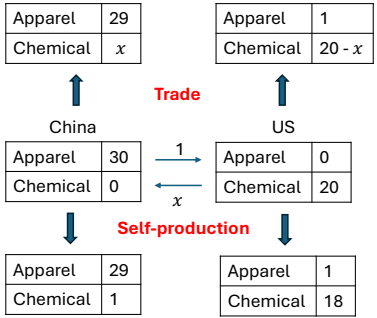
| | |
|---|---|
| Apparel | 30 |
| Chemical | 0 |

US

| | |
|---|---|
| Apparel | 0 |
| Chemical | 20 |

# Terms of trade (Section 7.3 of Textbook)

- How many units of chemicals ($x$ units) can be exchanged for 1 unit of apparel?
- Each country has two options:
  Trade v.s. Self-production
- For China to prefer trade: $x > 1$
- For US to prefer trade: $20 - x > 18 \Rightarrow x < 2$
- Terms of trade should fall between te opportunity costs of the two countries to be *mutually beneficial*



# From autarky to trade