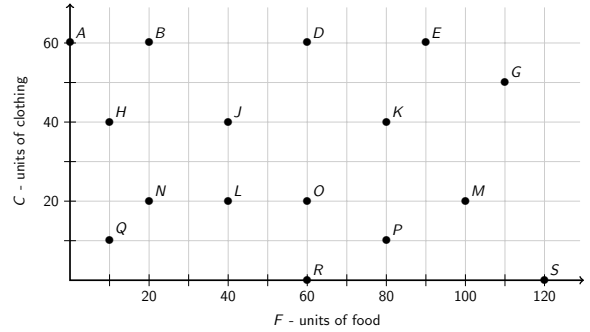
Agenda

1. Where Are We?
2. The Budget Constraint
3. Optimal Choice
4. Applications
5. Revealed Preference

Available Baskets

- Every month you make $I = \$120$.
- Must allocate I over two goods,
  - C - Clothing at price $P_C = \$2$ per unit.
  - F - Food at price $P_F = \$1$ per unit.

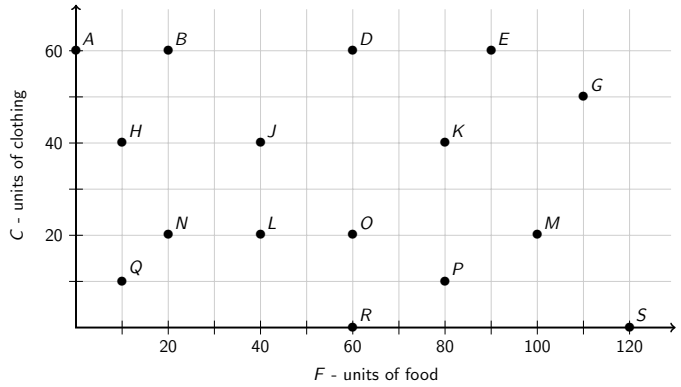


Budget Constraint

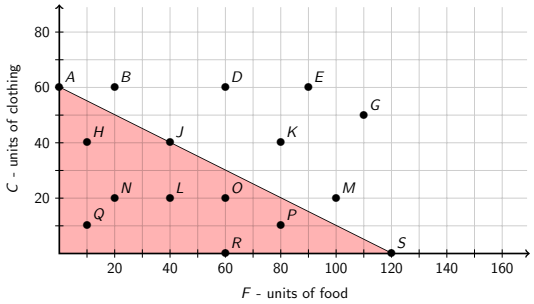
- **Budget Constraint:**
- **Budget Line:**

Equation	Slope	Value at $C = 0$	Value at $F = 0$

Available Baskets

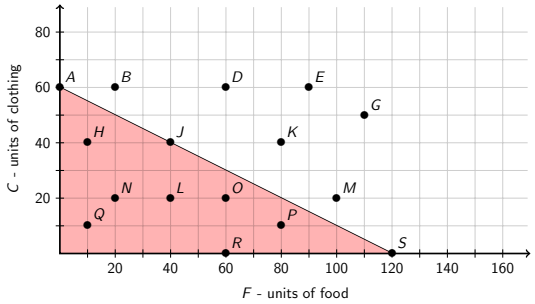


Change in Income



	Budget Line Shift	Baskets Available
Increase in ($I = 160$)		
Decrease in ($I = 80$)		

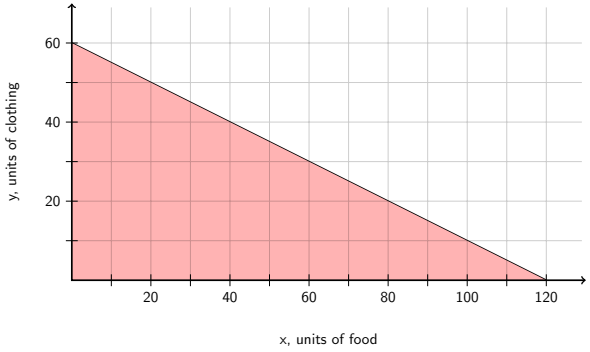
Change in Price



	Budget Line Shift	Baskets Available
Increase ($P_F = 1.5$)		
Decrease in ($P_F = 0.75$)		

Optimal Basket

- What is the optimal basket?



- **Interior optimum** - A utility maximizing basket at which the consumer is

_____

Tangency Condition

- **Tangency Condition**: All baskets where the slope of the indifference curves are equal to the slope of the budget line.

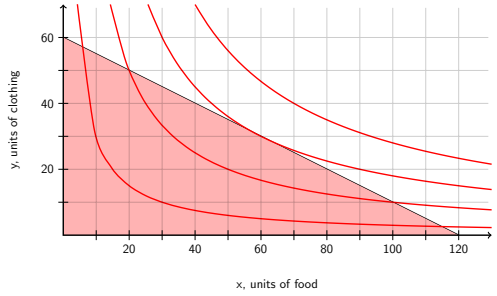
Example: $I = 120$ $P_x = 1$

$U(x, y) = xy$ $P_y = 2$

- Negative Slope of Indifference Curve:

- Negative Slope of Budget Line:

- Tangency Condition:



Tangency Condition - Take 2

- Tangency Condition:

- Can also be written as,

If...	Then

Exercise

- Consumer has income $I = 120$.
- Faces prices $P_F = 1$ and $P_C = 2$.
- Utility $U(F, C) = \sqrt{FC}$.
- Find

$$\frac{MU_F}{P_F} \quad \text{and} \quad \frac{MU_C}{P_C} \quad \text{and} \quad MRS_{F,C}$$

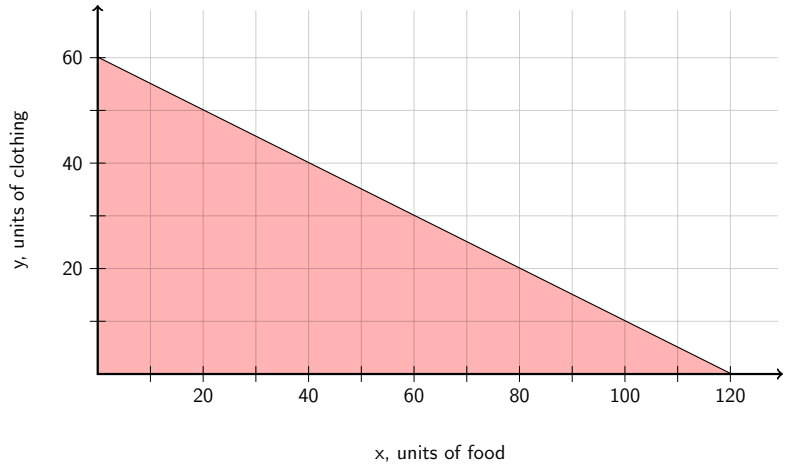
and tell what the consumer should do.

(F, C)	$(20, 50)$	$(60, 30)$	$(100, 10)$

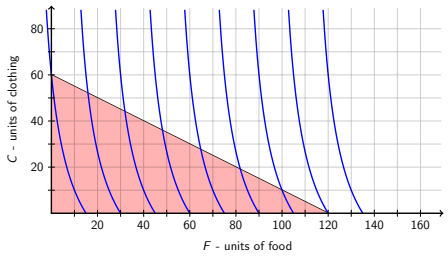
Solution

(F, C)	$(20, 50)$	$(60, 30)$	$(100, 10)$
$\frac{MU_F}{P_F}$			
$\frac{MU_C}{P_C}$			
$MRS_{F,C}$			
Recommendation			

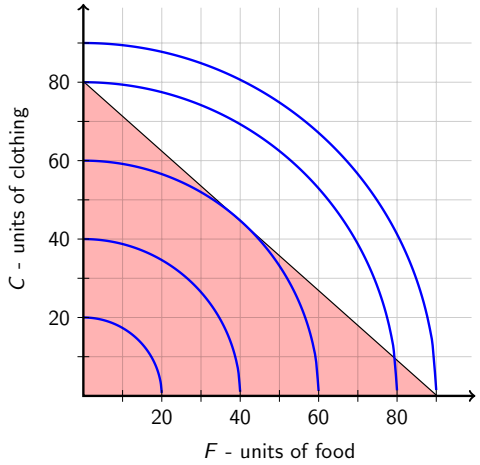
Solution



- What is the optimal basket?



- What is the optimal basket?



Optimal Baskets

- Review of optimal basket,
  - Given I, P_x and P_y, _____
  - Additionally given $U(x, y)$, _____
- Remember
  - If consumer likes both goods,

    _____
  - If the solution is an interior solution,

    _____
  - If the optimal basket is a corner solution,

    _____

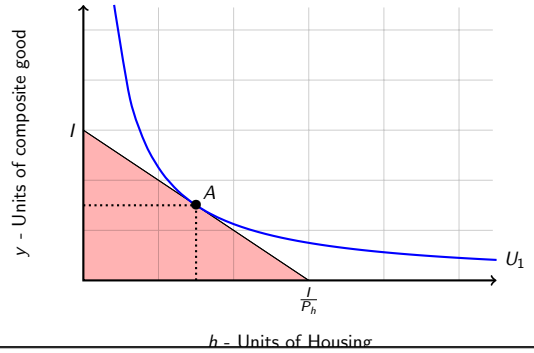
Steps for Solving

- As long as consumer likes both goods, the optimal basket can be found with the following:

- A Cobb-Douglass Utility function ($U(x, y) = Ax^{\alpha}y^{\beta}$)

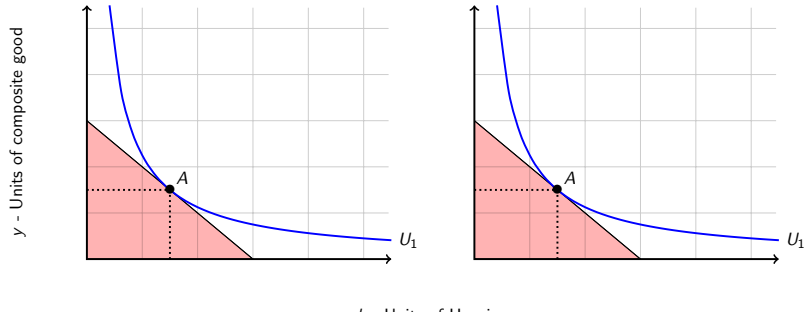
Composite Good

Definition (Composite Good)



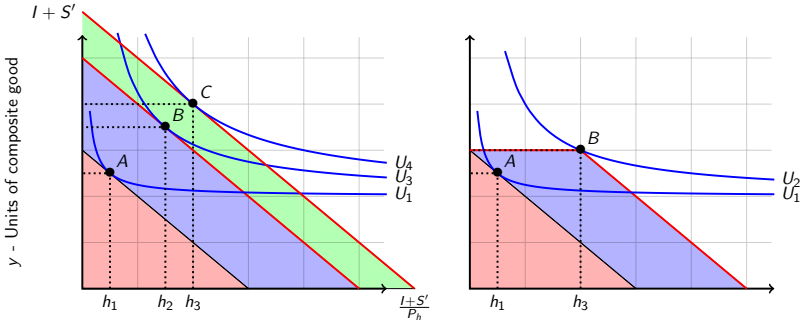
Subsidy vs. Voucher

- Problem: Government wants to stimulate housing purchases
  - Subsidy: Give everyone \$S.
  - Voucher: Give up to \$S to all home-buyers.



(a) Subsidy (b) Voucher

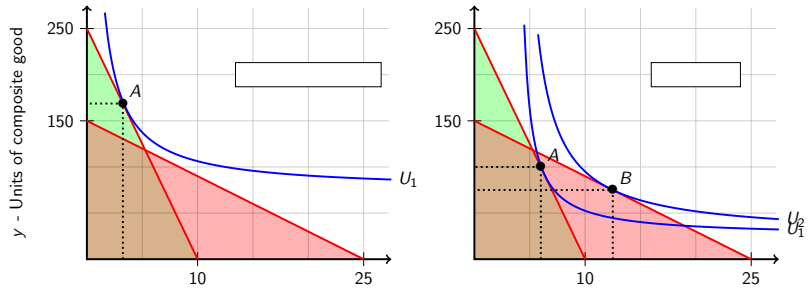
Subsidy vs. Voucher



(a) Subsidy (b) Voucher

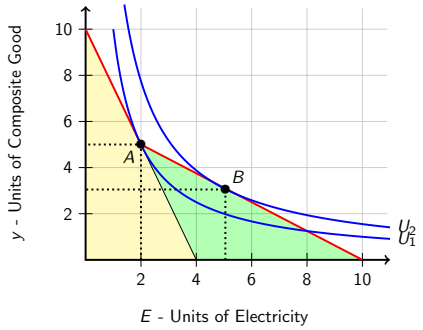
Discount Clubs

- Income $I = \$250$.
- Cost of CD's \$25.
- CD club,
  - Cost \$100.
  - Reduces price of CD's to \$6.



Quantity Discount

- Income \$10.
- Electricity costs \$2.50 per unit.
- Quantity Discount: Purchase more than 2 units, price drops to \$0.625 per unit.



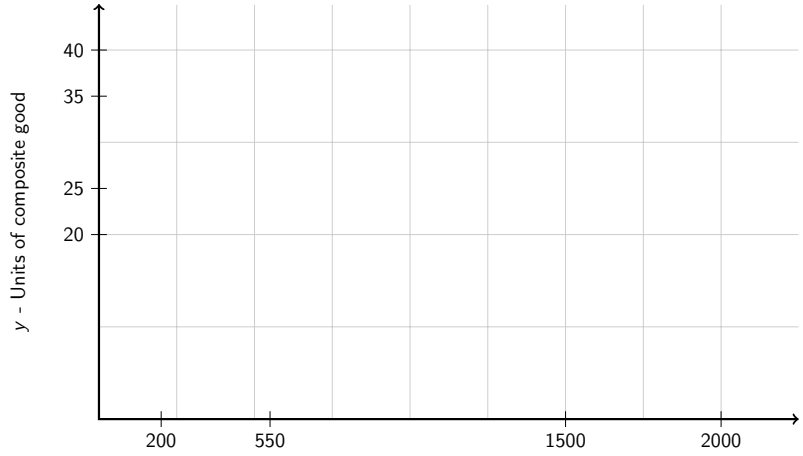
Exercise

- Suppose you have \$40 to spend on a text messaging plan.
- Draw set of available baskets for AT&T tiered plans.

Plan	Monthly Cost	Extra Messages
No Plan	\$0	\$0.20
200 Messages	\$5	\$0.10
1500 Messages	\$15	\$0.05
Unlimited	\$20	\$0

- Draw indifference curves for consumers that would buy each plan.

Solution

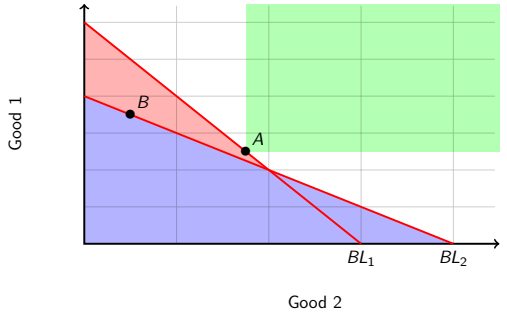


Revealed Preference

Definition (Revealed Preferred)

Basket A is revealed preferred to basket B ($A \succeq B$) if _____

_____



Revealed Preference Example

- Consumer has $I = \$24$.
- Observations:
  - When $(P_x, P_y) = (\$4, \$2)$, chooses $A = (5, 2)$.
  - When $(P_x, P_y) = (\$3, \$3)$, chooses $B = (2, 6)$.
- Do these choices maximize utility?