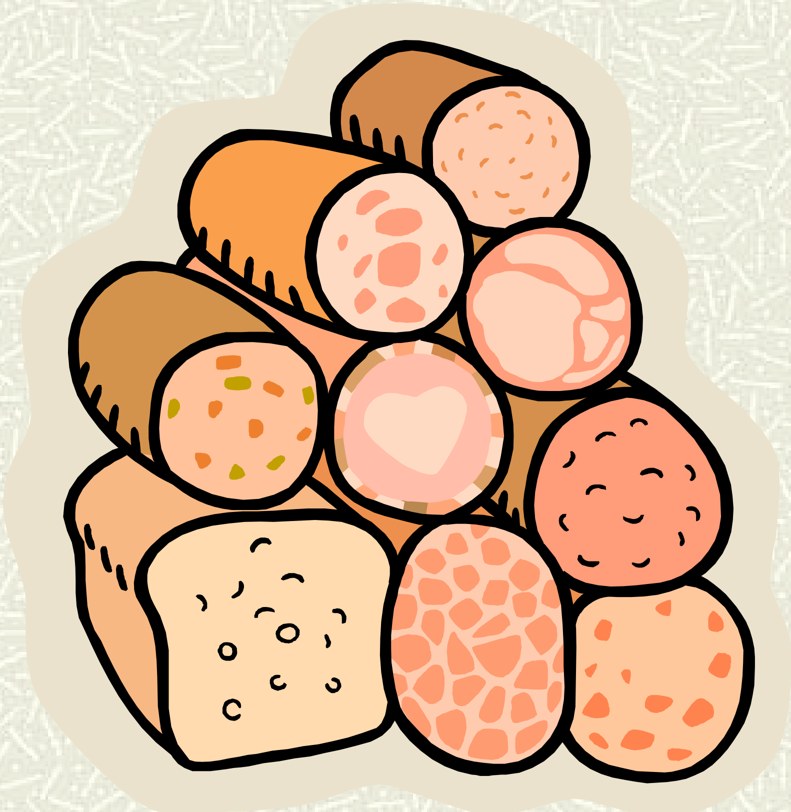
Demand



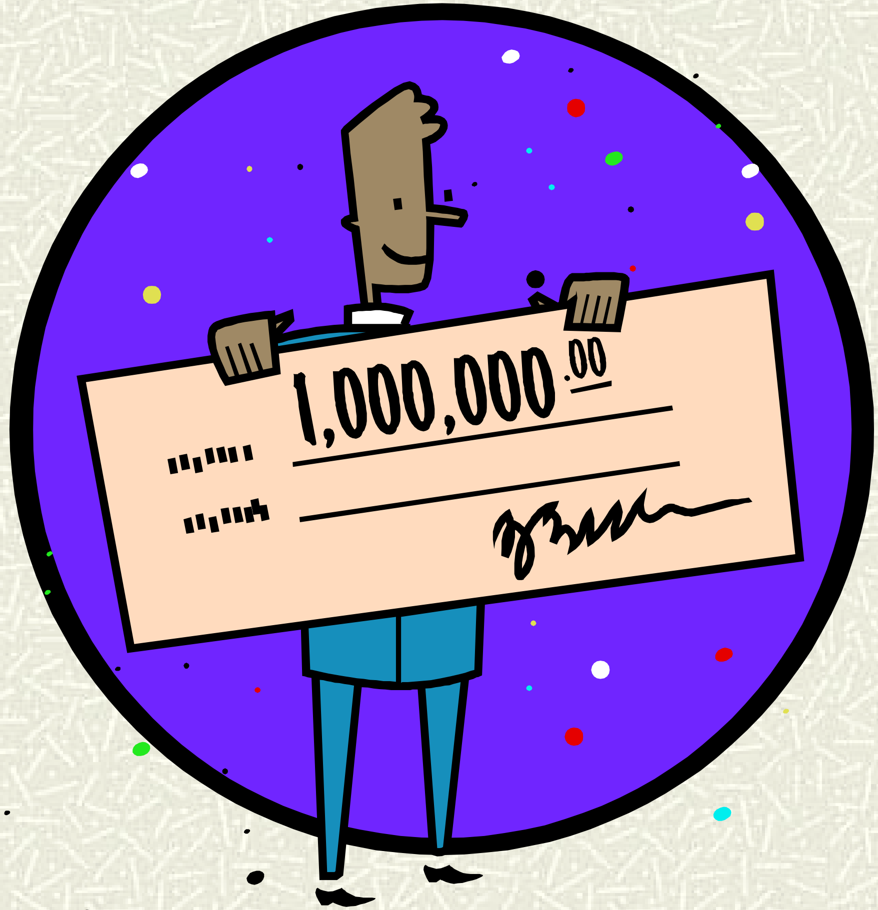
Consumer Demand

Consumer's **demand functions**:

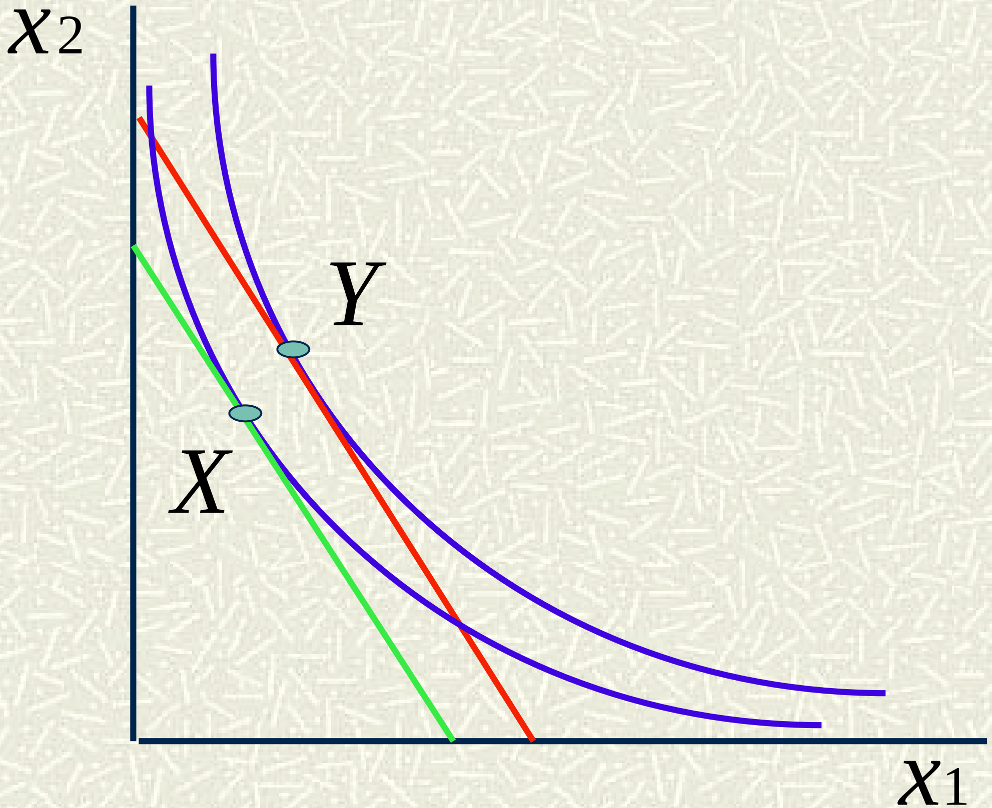
$$x_1 = x_1(p_1, p_2, m)$$

$$x_2 = x_2(p_1, p_2, m)$$

Changes in Income Given Prices



Normal Goods

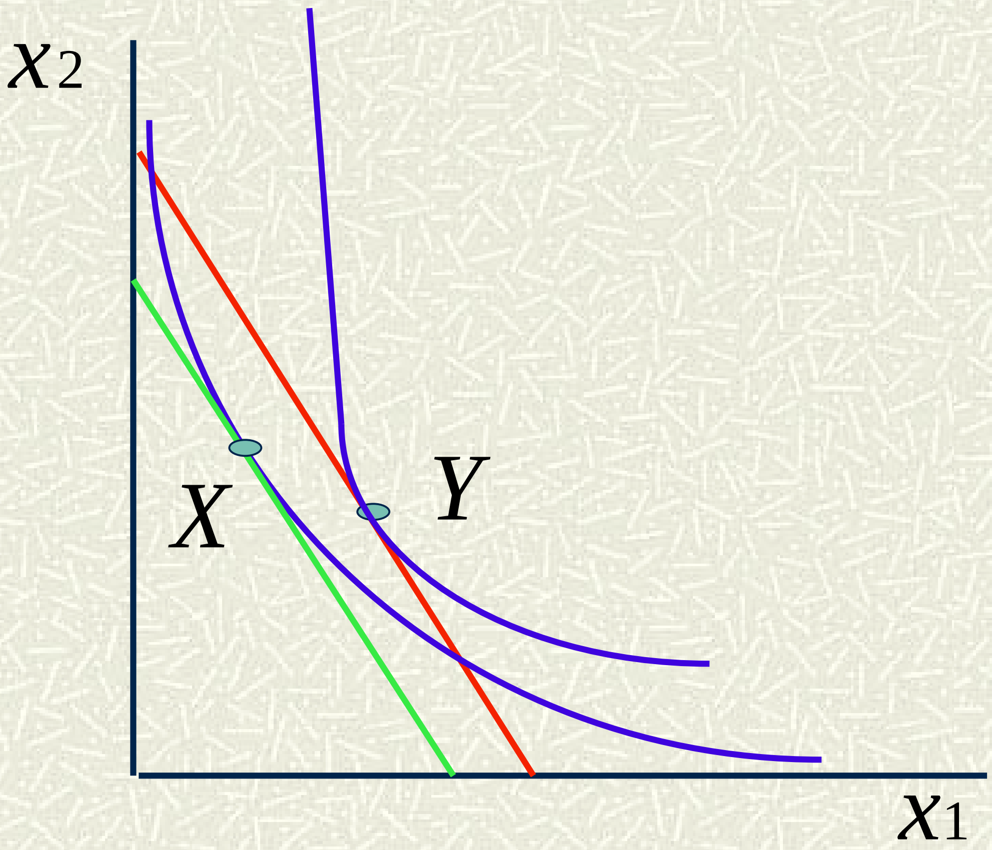


- Both goods 1 and 2 are normal

$$\frac{\partial x_1(p_1, p_2, m)}{\partial m} > 0$$

$$\frac{\partial x_2(p_1, p_2, m)}{\partial m} > 0$$

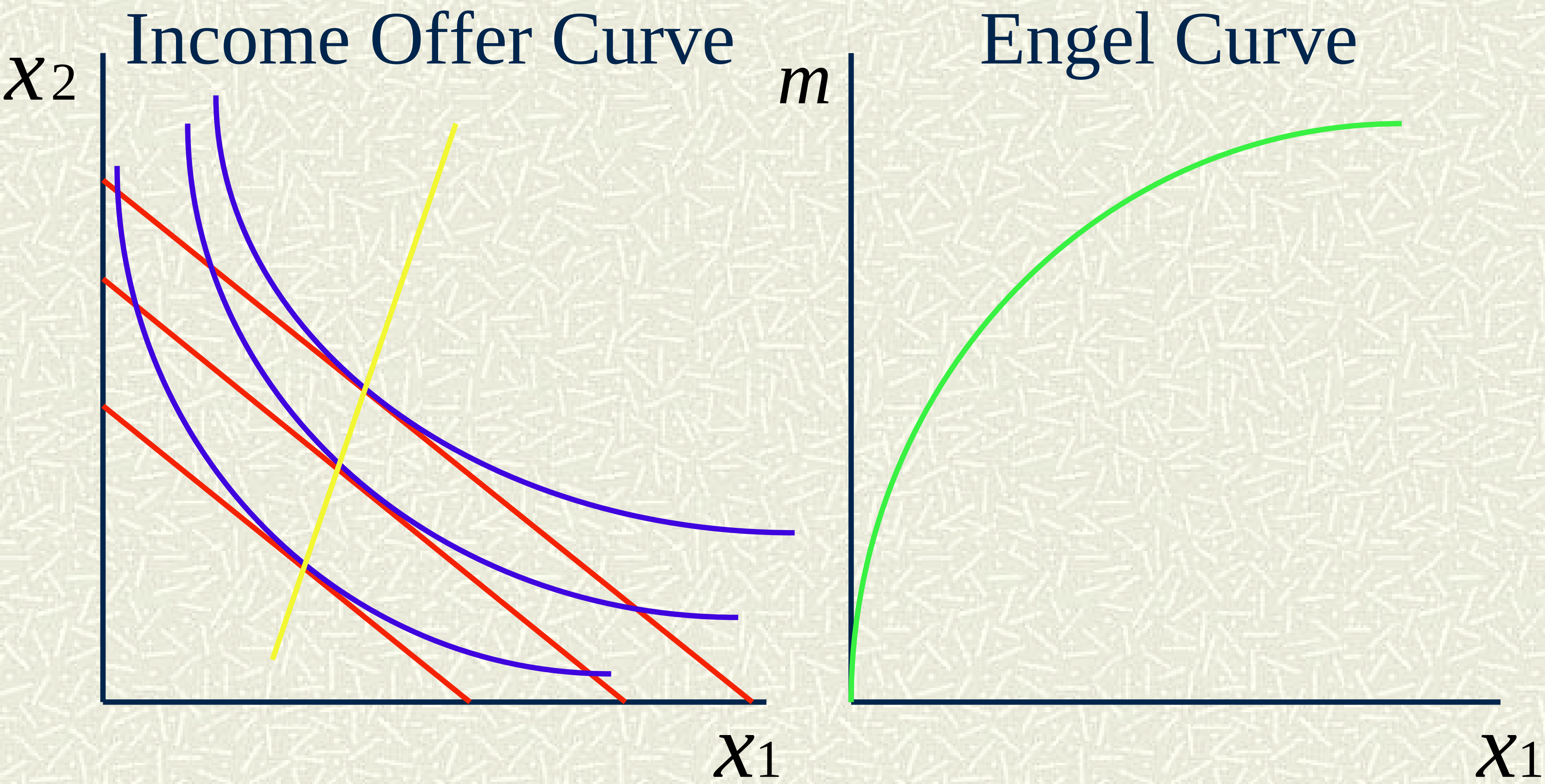
An Inferior Good



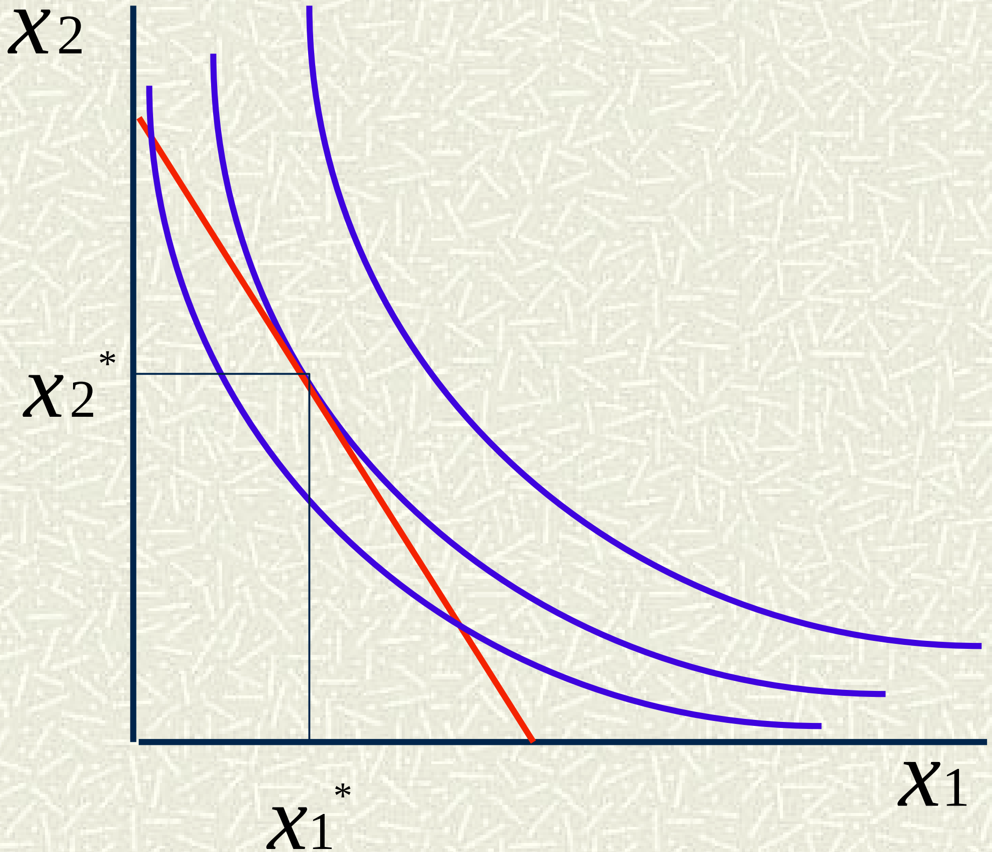
- Good 1 is **normal**.
- Good 2 is **inferior**:

$$\frac{\partial x_2(p_1, p_2, m)}{\partial m} < 0$$

Income Offer and Engel Curves



Cobb-Douglas



- Demand function for good 1:

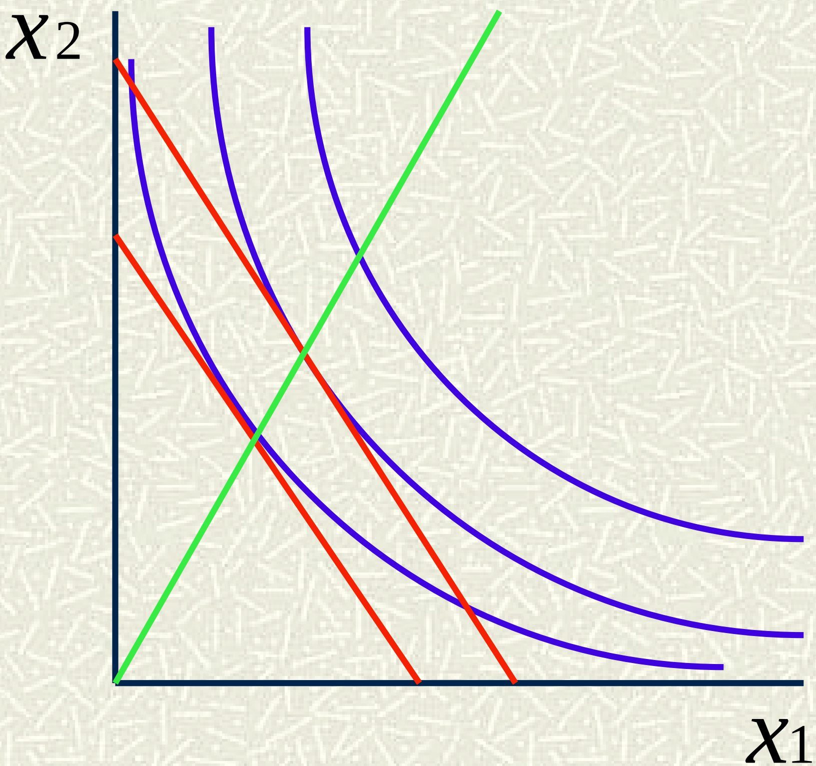
$$x_1 = c\frac{m}{p_1}$$

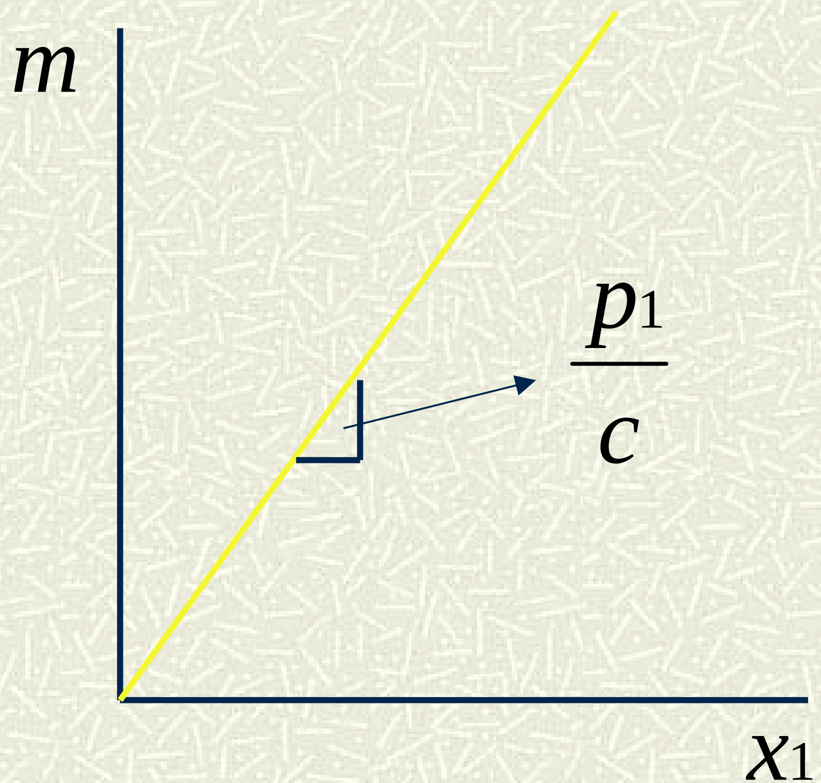
- Demand function for good 2:

$$x_2 = (1-c)\frac{m}{p_2}$$

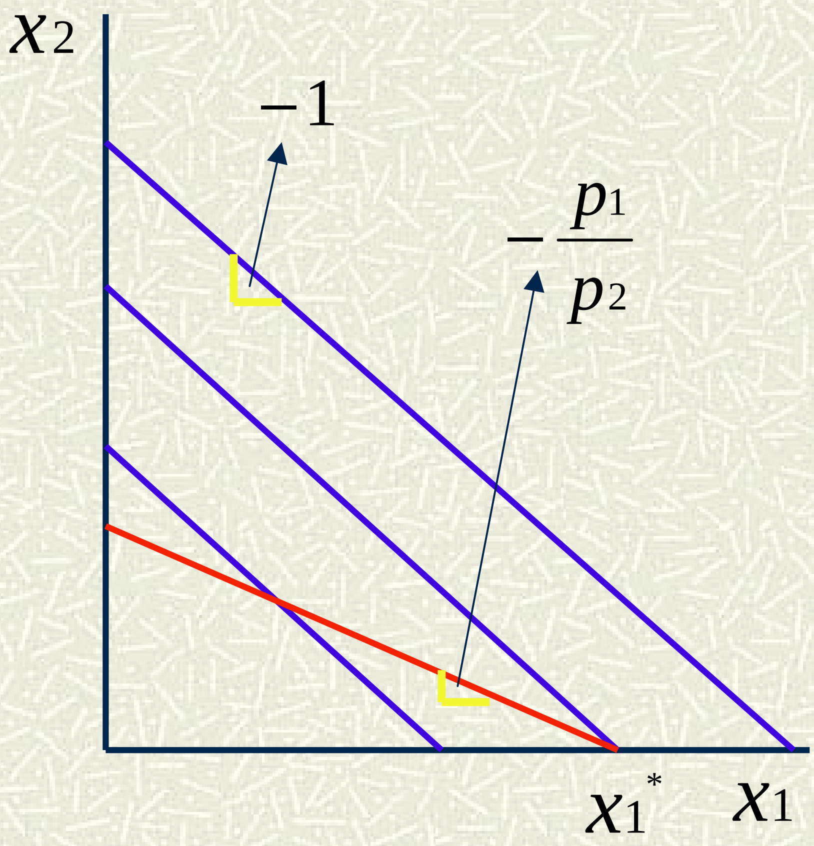
Cobb Douglas

Income Offer Curve: ——— Engel Curve: ———





Perfect Substitutes



- Demand function for good 1:

$$x_1 = m / p_1 \text{ if } p_1 < p_2$$

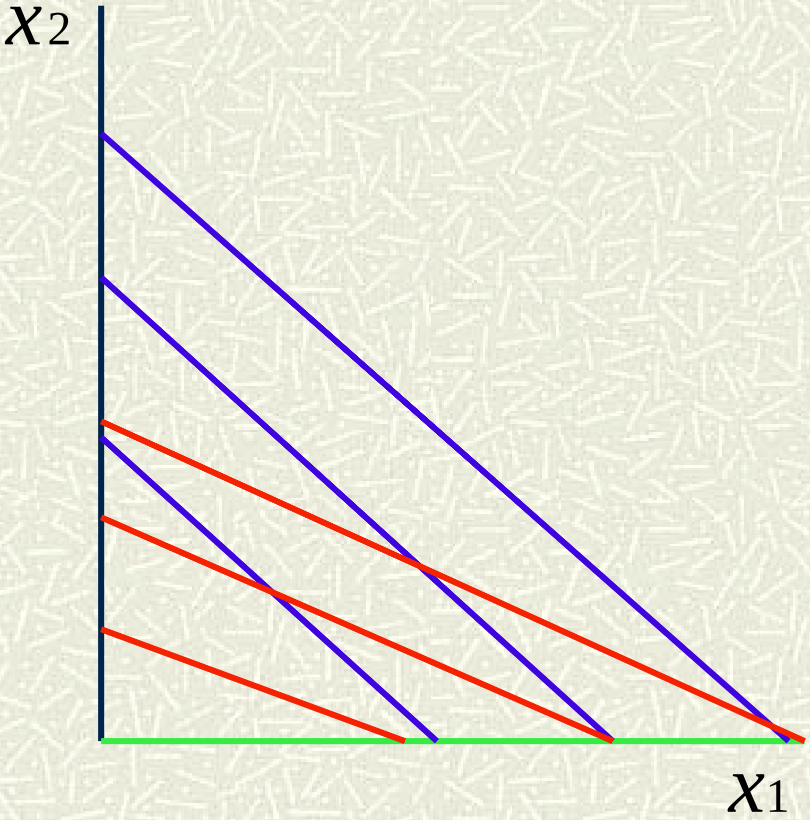
$$x_1 = 0 \text{ if } p_1 > p_2$$

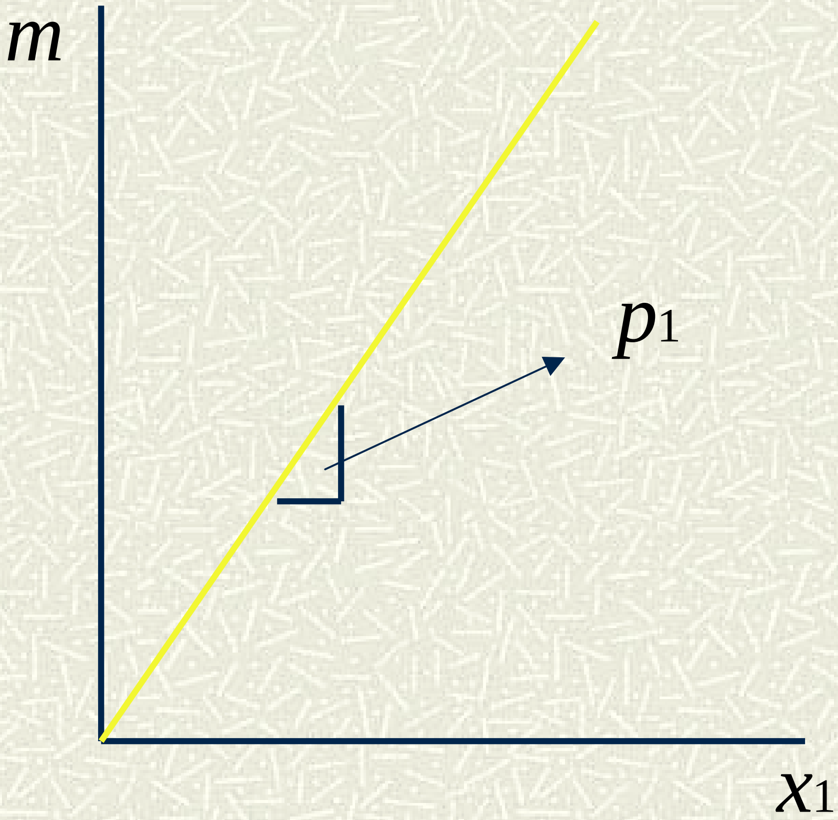
$$x_1 = (0, m / p_1) \text{ if } p_1 = p_2$$

Perfect Substitutes (with $p_1 < p_2$)

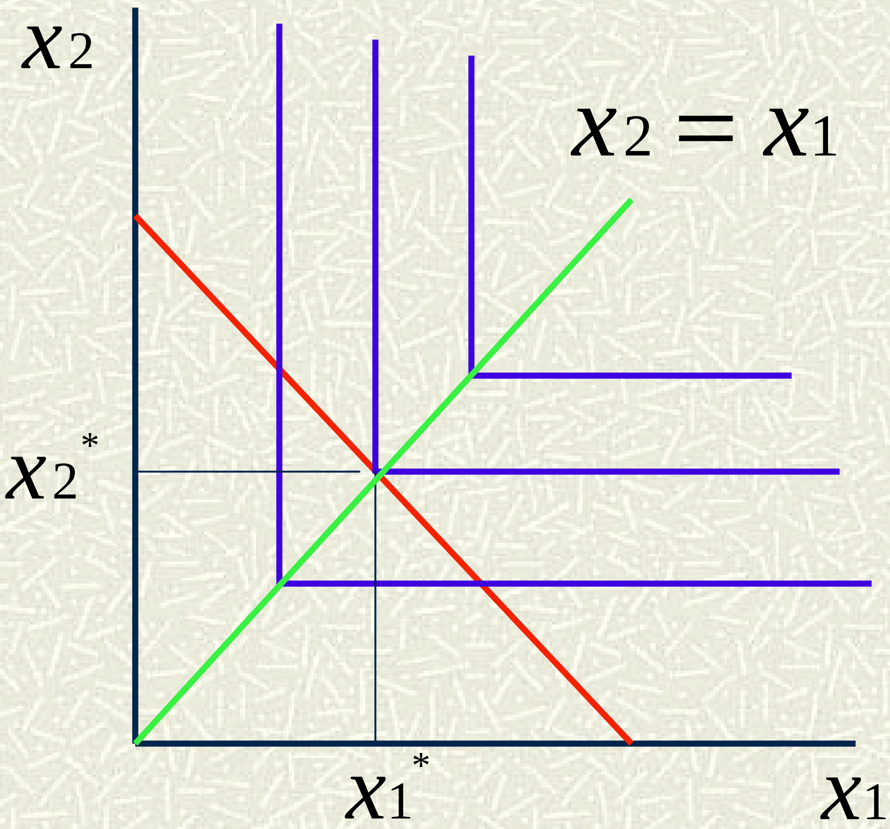
Income Offer Curve:

Engel Curve:





Perfect Complements



- Optimal choice: $x_2 = x_1$
- Budget line:

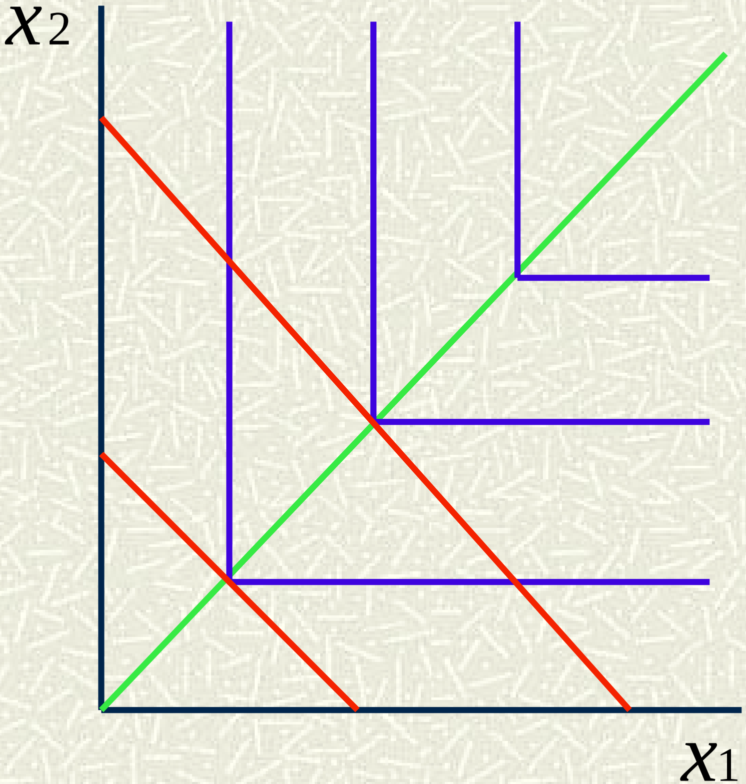
$$p_1 x_1 + p_2 x_2 = m$$

- Demand function for goods 1 and 2:

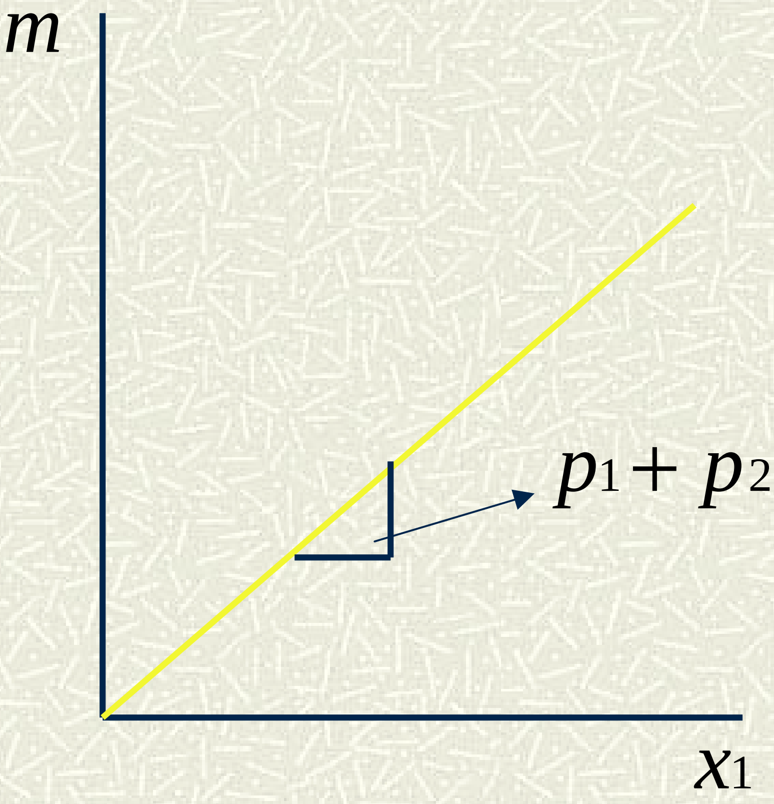
$$x_1 = x_2 = \frac{m}{p_1 + p_2}$$

Perfect Complements

Income Offer Curve:



Engel Curve:



Homothetic Preferences

- Consumer's preferences only depend on the ratio of the two goods:

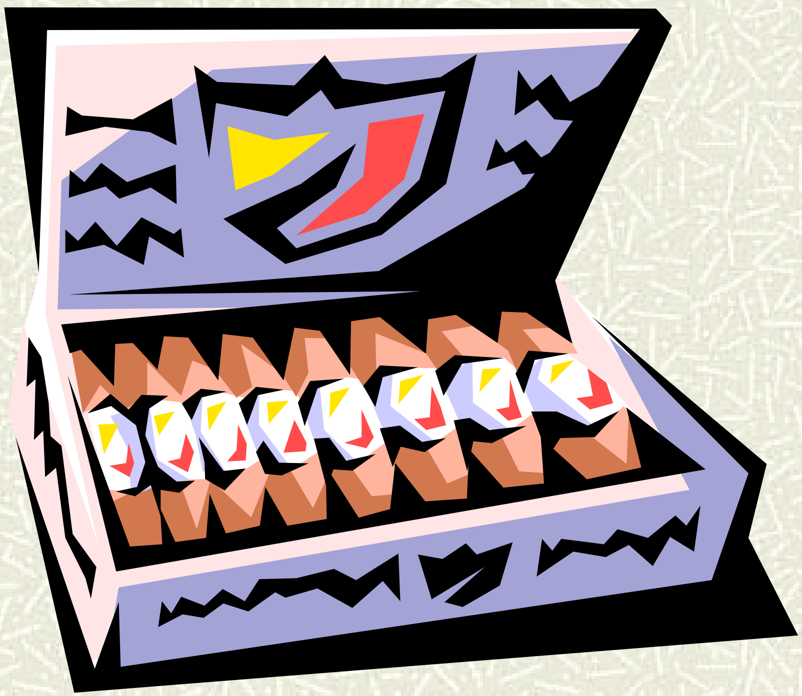
  If $(x_1, x_2) \sim (y_1, y_2)$

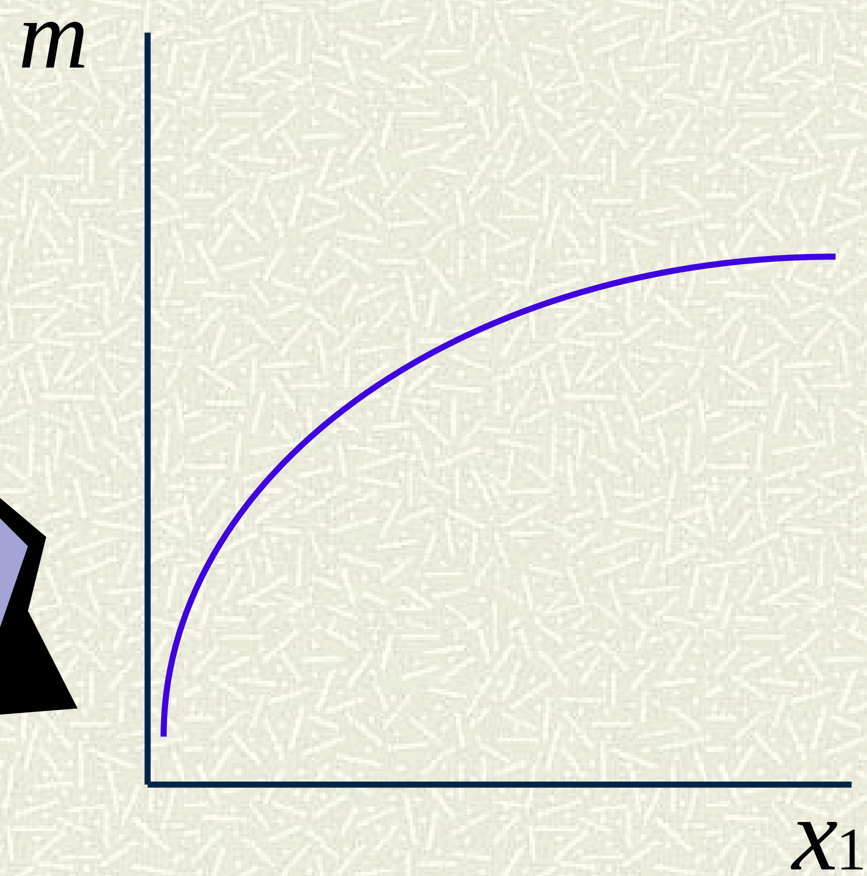
  Then, for $t > 0$

  $$(tx_1, tx_2) \sim (ty_1, ty_2)$$

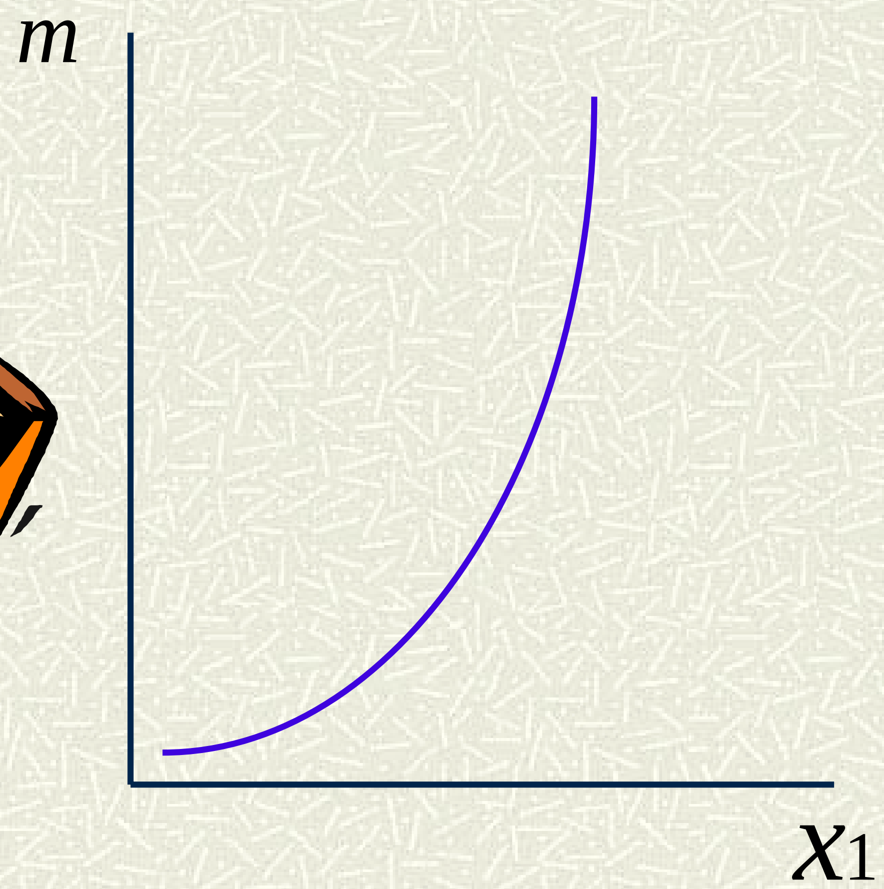
- Example: Cobb-Douglas, Perfect substitutes, Perfect Complements.
- Properties: straight income offer curve and Engel curve.

Luxury Good





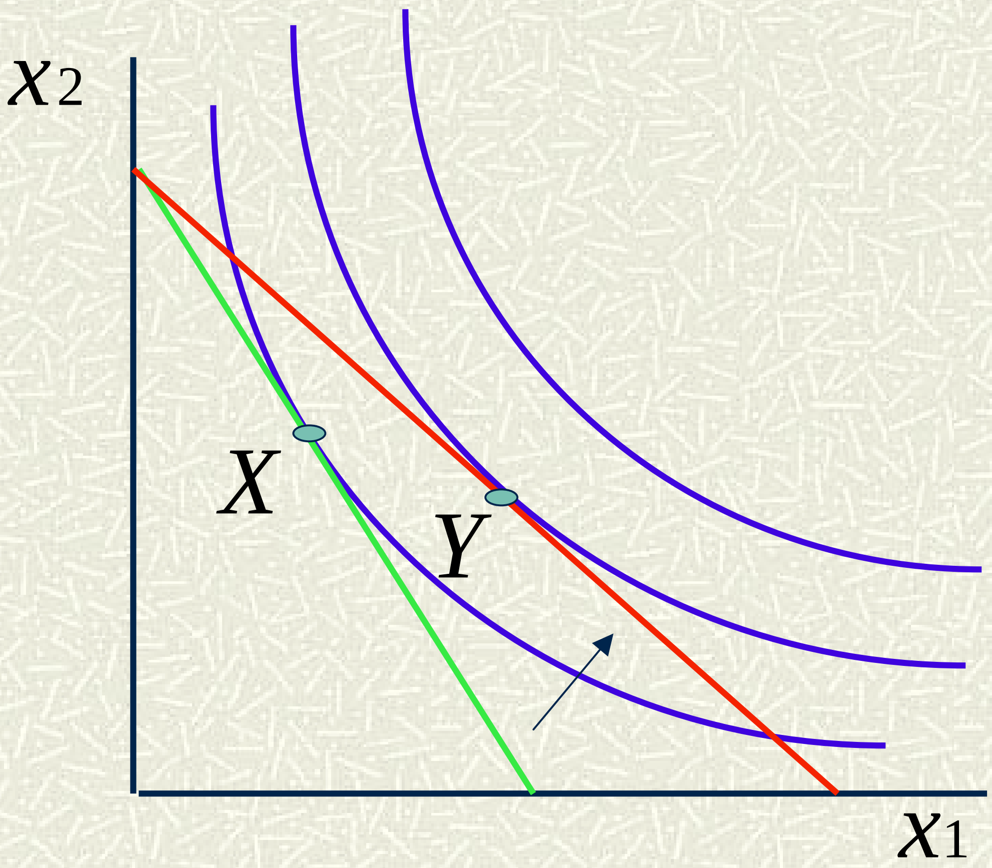
Necessary Good



Changes in Prices

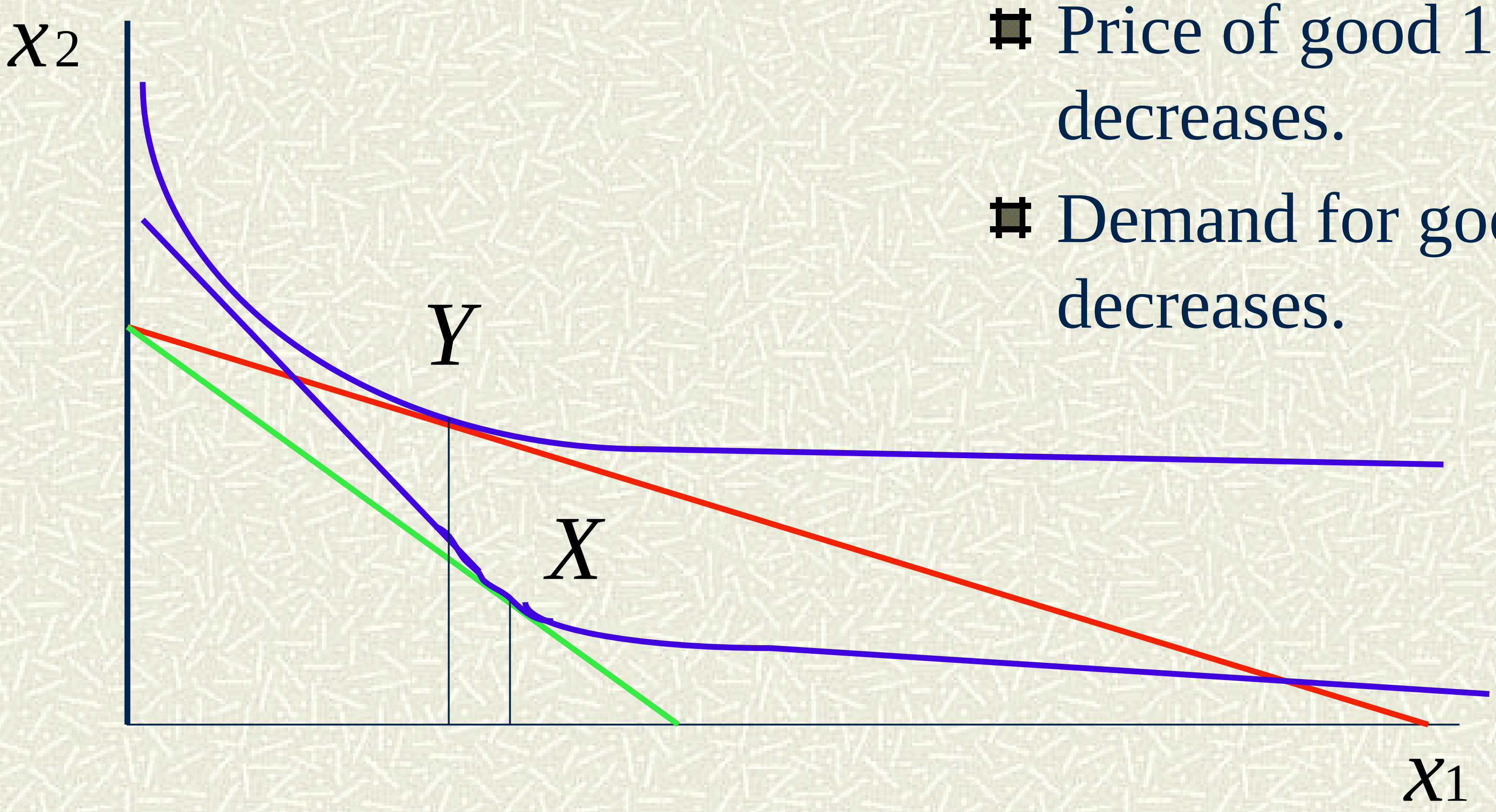
- Fix income and price of one good and change price of the other.

Ordinary Goods



- Price of good 1 decreases.
- Demand for good 1 increases.

Giffen Goods

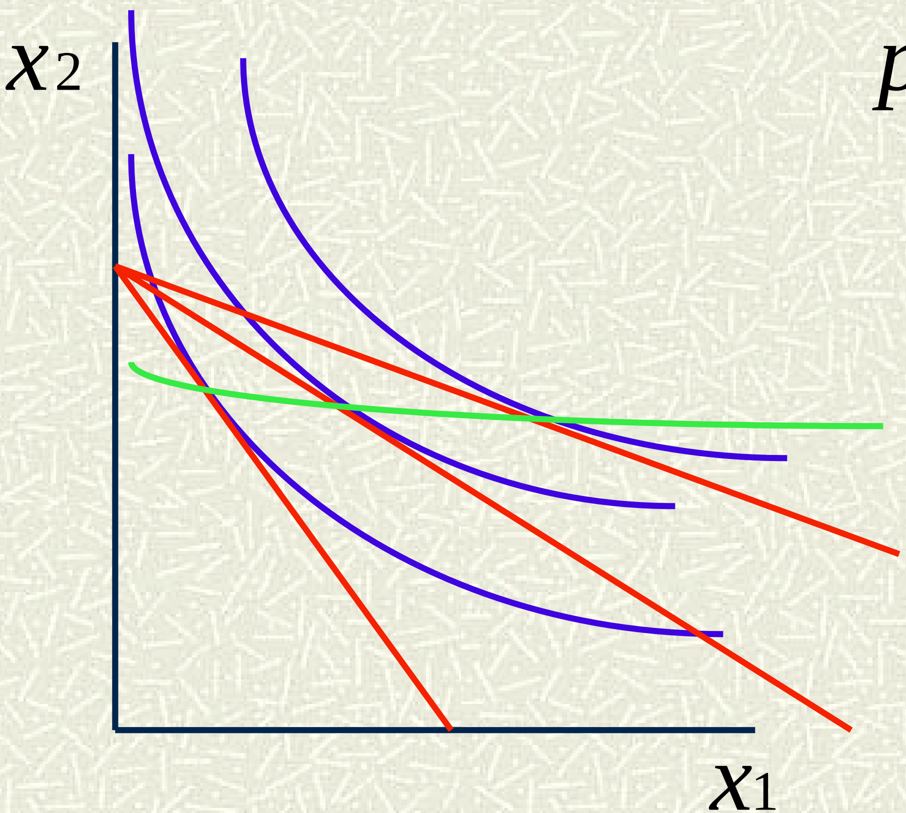


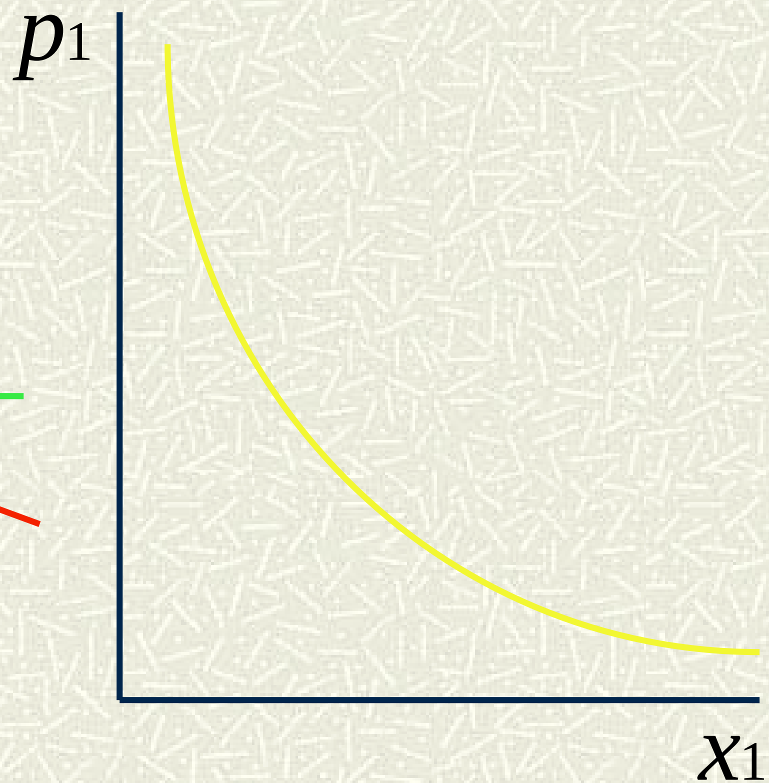
- Price of good 1 decreases.
- Demand for good 1 decreases.

Price Offer and Demand Curves

Price Offer Curve:

Demand Curve:

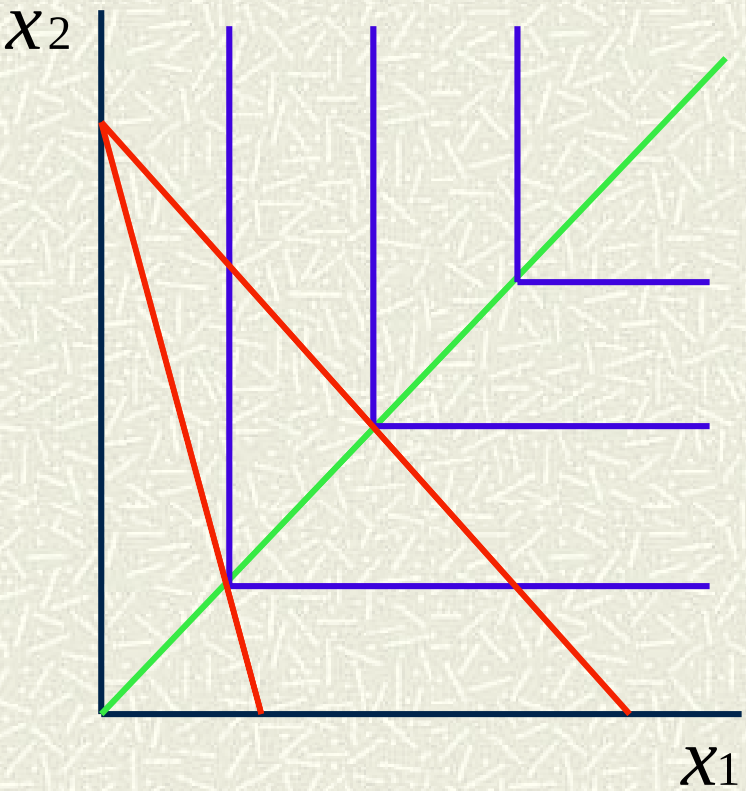


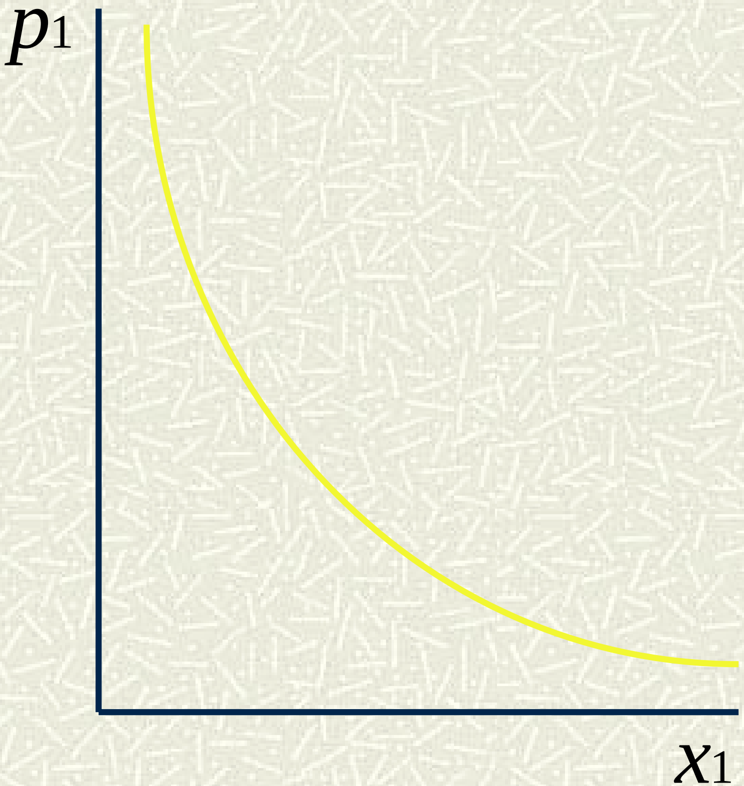


Perfect Complements

Price Offer Curve:

Demand Curve:

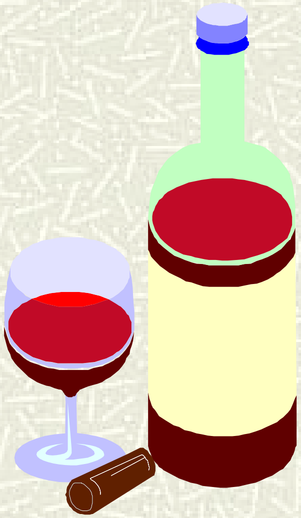




Substitutes

- Good 1 is a substitute for good 2 when:

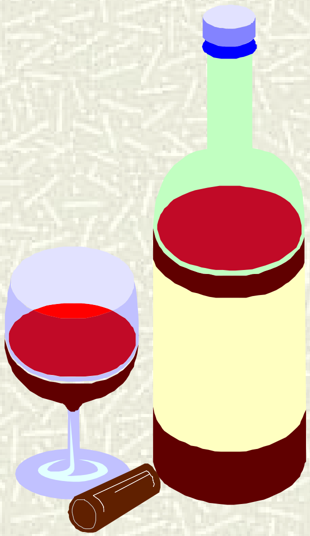
$$\frac{\partial x_1(p_1, p_2, m)}{\partial p_2} > 0$$



Complements

- Good 1 is a complement to good 2:

$$\frac{\partial x_1(p_1, p_2, m)}{\partial p_2} < 0$$



Inverse Demand Function

- Consider a demand function

$$x_1 = x_1(p_1, p_2, m)$$

- The inverse demand function is

$$p_1 = p_1(x_1)$$

Cobb-Douglas example:

$$x_1 = c\frac{m}{p_1}$$

$$p_1 = c\frac{m}{x_1}$$

Inverse Demand Curve

- Optimal choice:

$$\frac{p_1}{p_2} = -MRS$$

- Suppose: $p_2 = 1$ (composite good)
- Rearrange:

$$p_1 = -MRS$$

Inverse Demand Curve