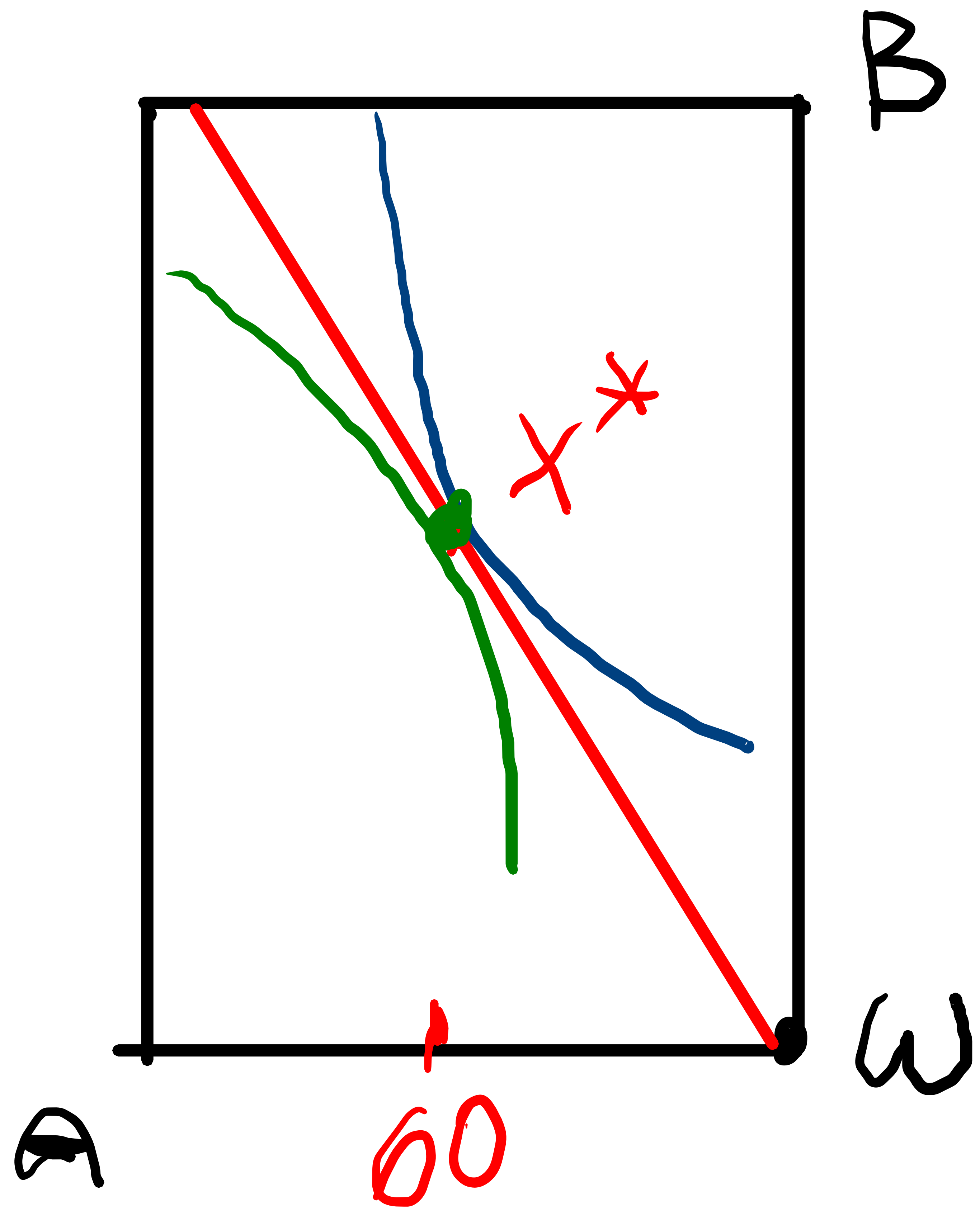
competitive equilibrium $p_2 = 1$

$\omega^A = (120, 0)$ $\omega^B = (0, 240)$

$u(x_1^A, x_2^A) = x_1^{A\,1/2} \cdot x_2^{A\,1/2}$ $u(x_1^B, x_2^B) = x_1^{B\,1/3} x_2^{B\,2/3}$



$m^A = 120 p_1$ $x_1^A = \frac{1}{2} \frac{120 p_1}{p_1} = 60$

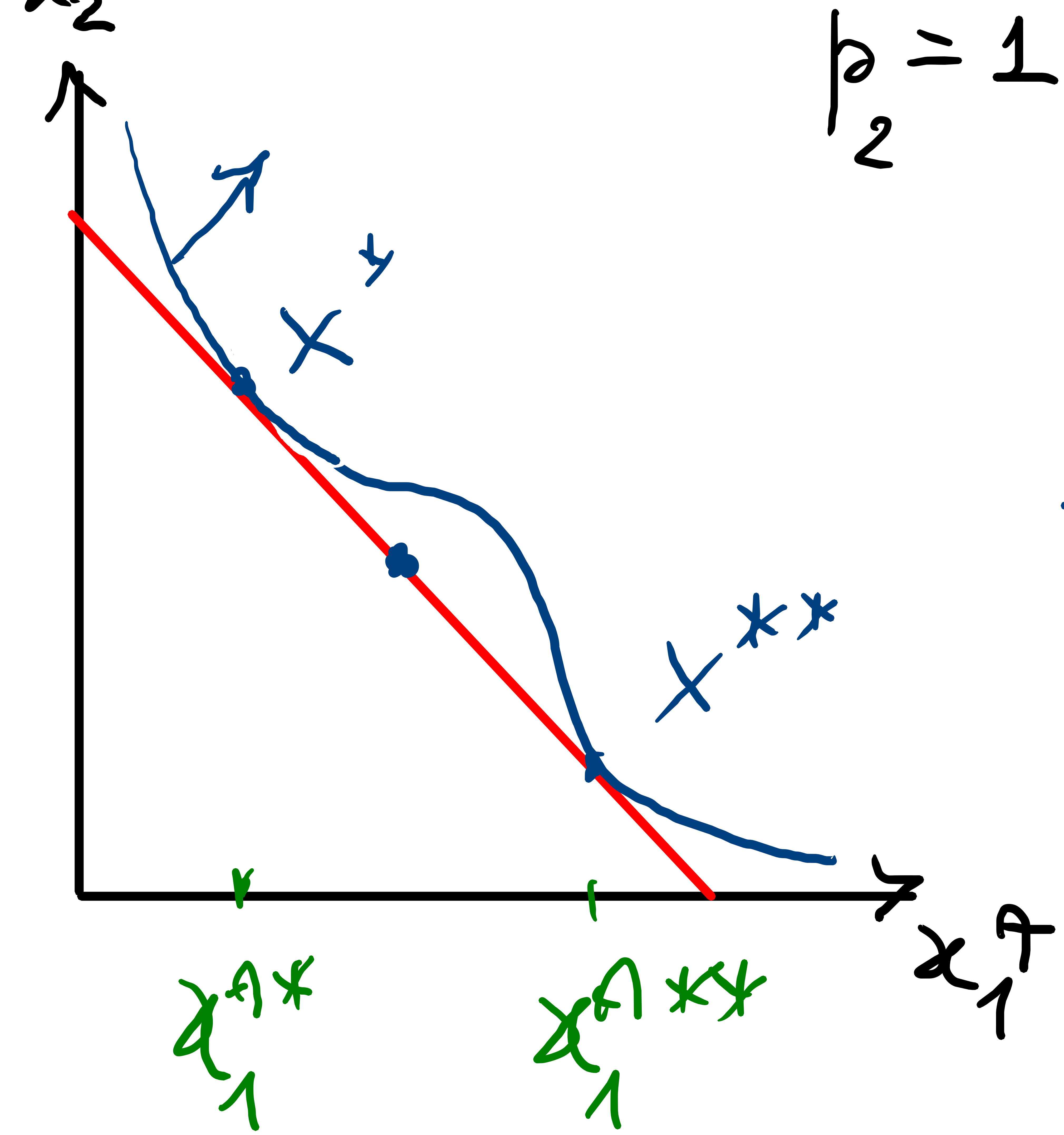
$m^B = 240$ $x_1^B = \frac{1}{3} \frac{240}{p_1} = \frac{80}{p_1}$

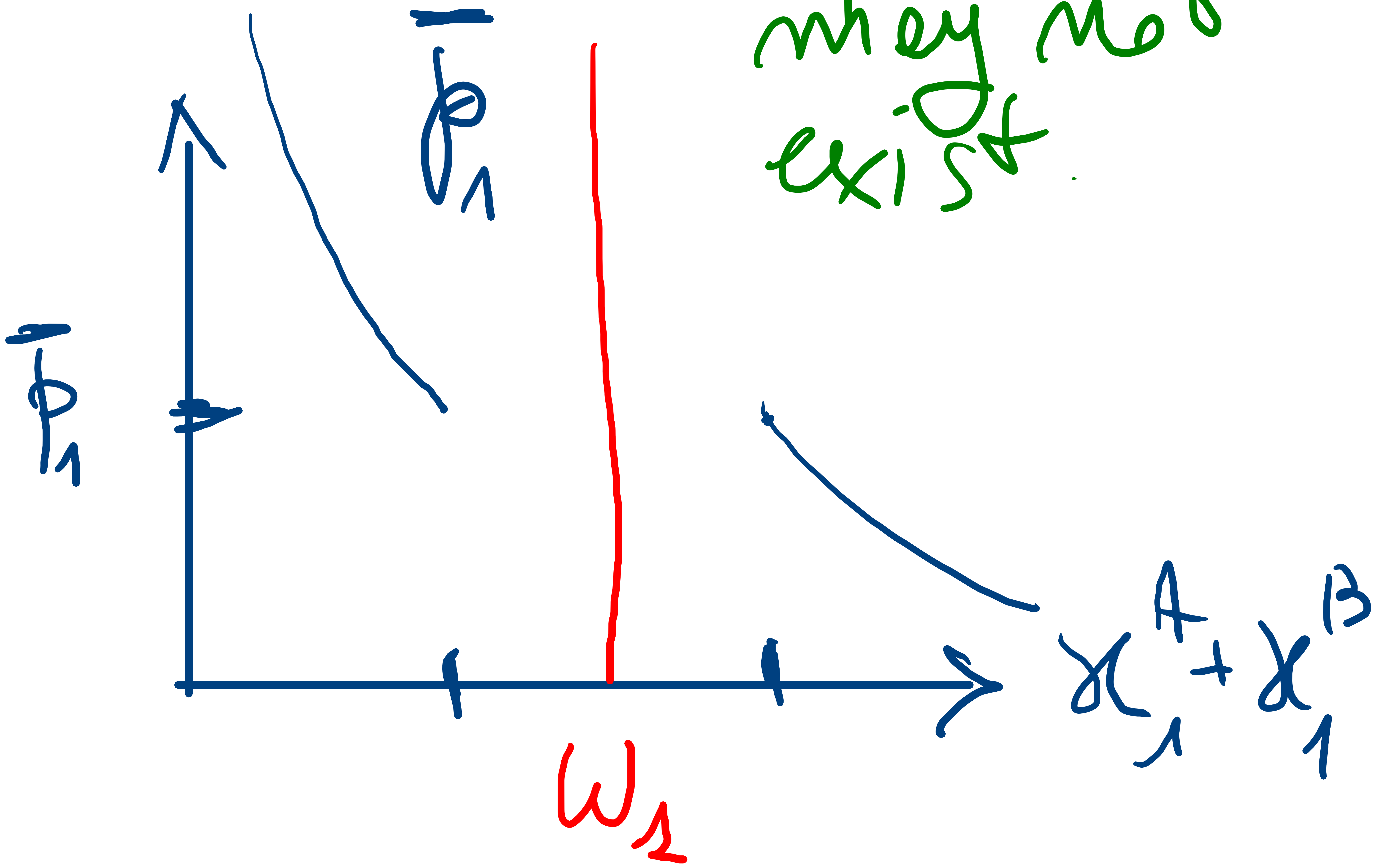
$x_1^A + x_1^B = \omega_1^A + \omega_1^B = 120$

$60 + \frac{80}{p_1} = 120$ $80 = 60 p_1$

$p_1^* = 4/3$

If A has non convex preferences, an equilibrium may not exist





1st Welfare Theorem

If there are no externalities then the equilibrium allocation x^* of a perfectly competitive economy is Pareto efficient.

Proof suppose theorem is false

X^* is not Pareto Efficient

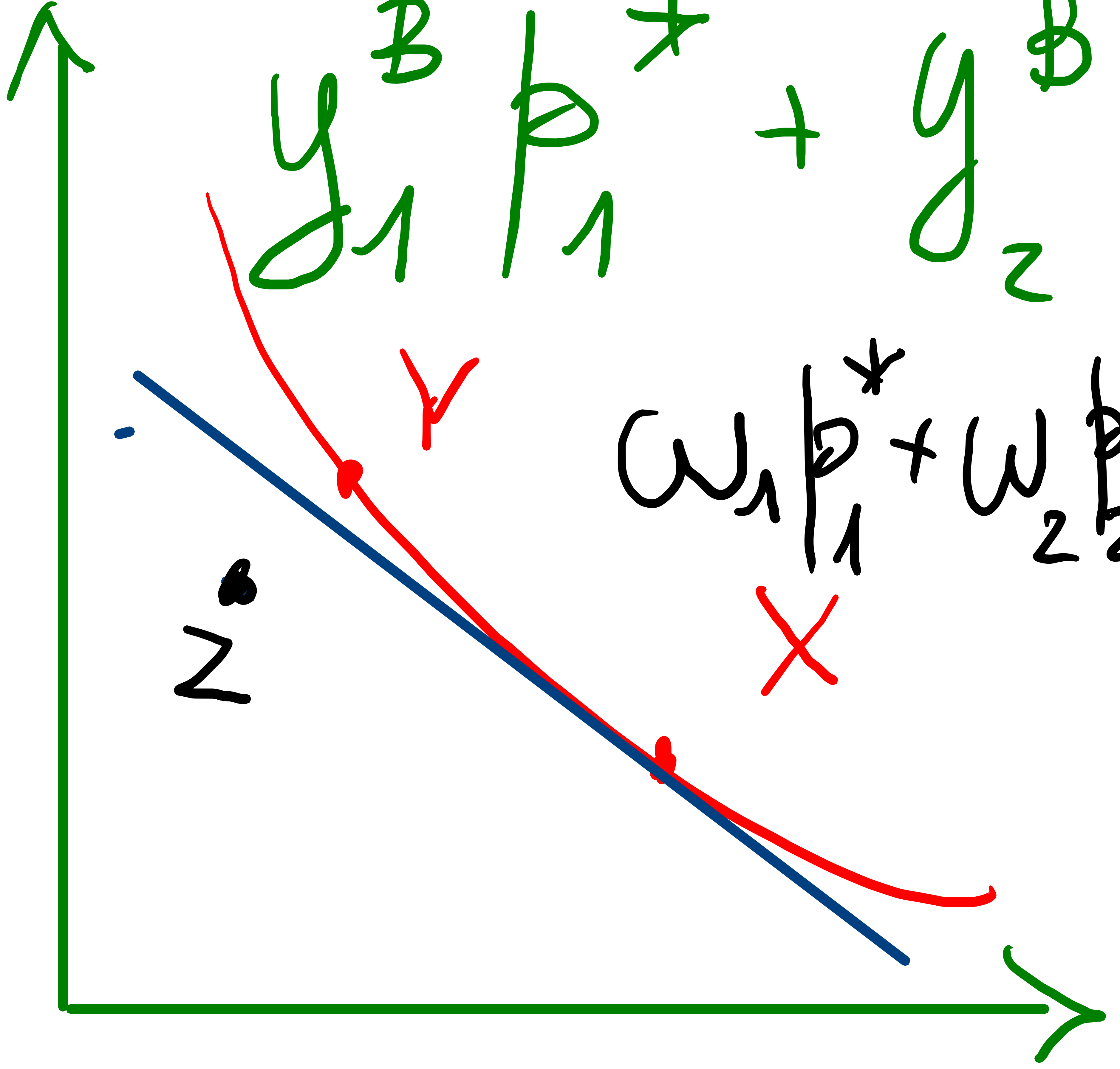
$\rightarrow$ there is feasible Y Pareto Superior to X^*

$$(y_1^A, y_2^A) \succ (x_1^{*A}, x_2^{*A})$$

$$(y_1^B, y_2^B) \succsim (x_1^{*B}, x_2^{*B})$$

X^* was chosen at p_1^*, p_2^*

by the revealed preference principle



$$y_1^A p_1^* + y_2^A p_2^* > x_1^{*A} p_1^* + x_2^{*A} p_2^*$$

$$y_1^B p_1^* + y_2^B p_2^* \geq x_1^{*B} p_1^* + x_2^{*B} p_2^*$$

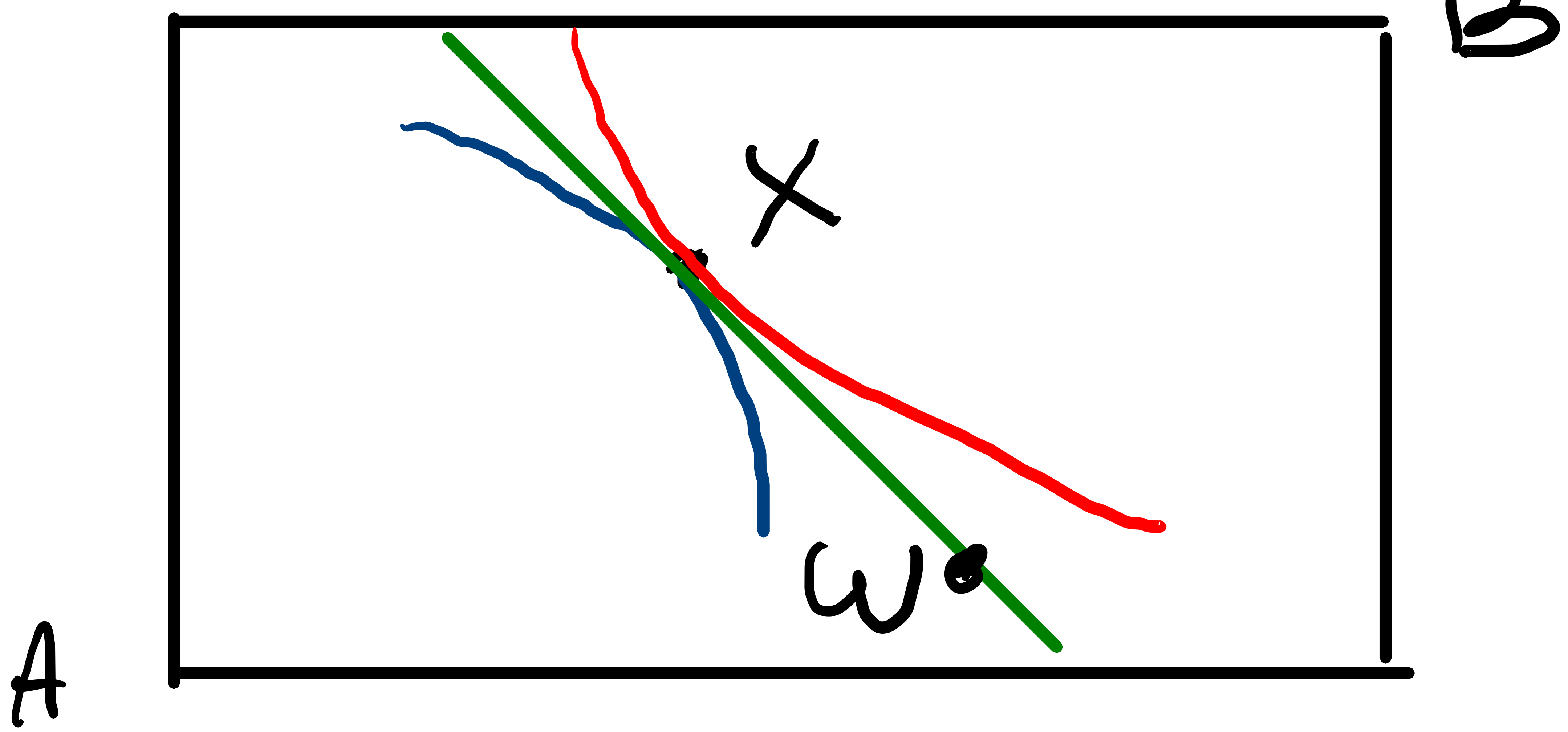
$$\omega_1 p_1^* + \omega_2 p_2^* = p_1^*(y_1^B + y_1^A) + p_2^*(y_2^B + y_2^A) >$$

$$> p_1^*(x_1^{*B} + x_1^{*A}) + p_2^*(x_2^{*B} + x_2^{*A})$$

$$p_1^* \omega_1 + p_2^* \omega_2$$

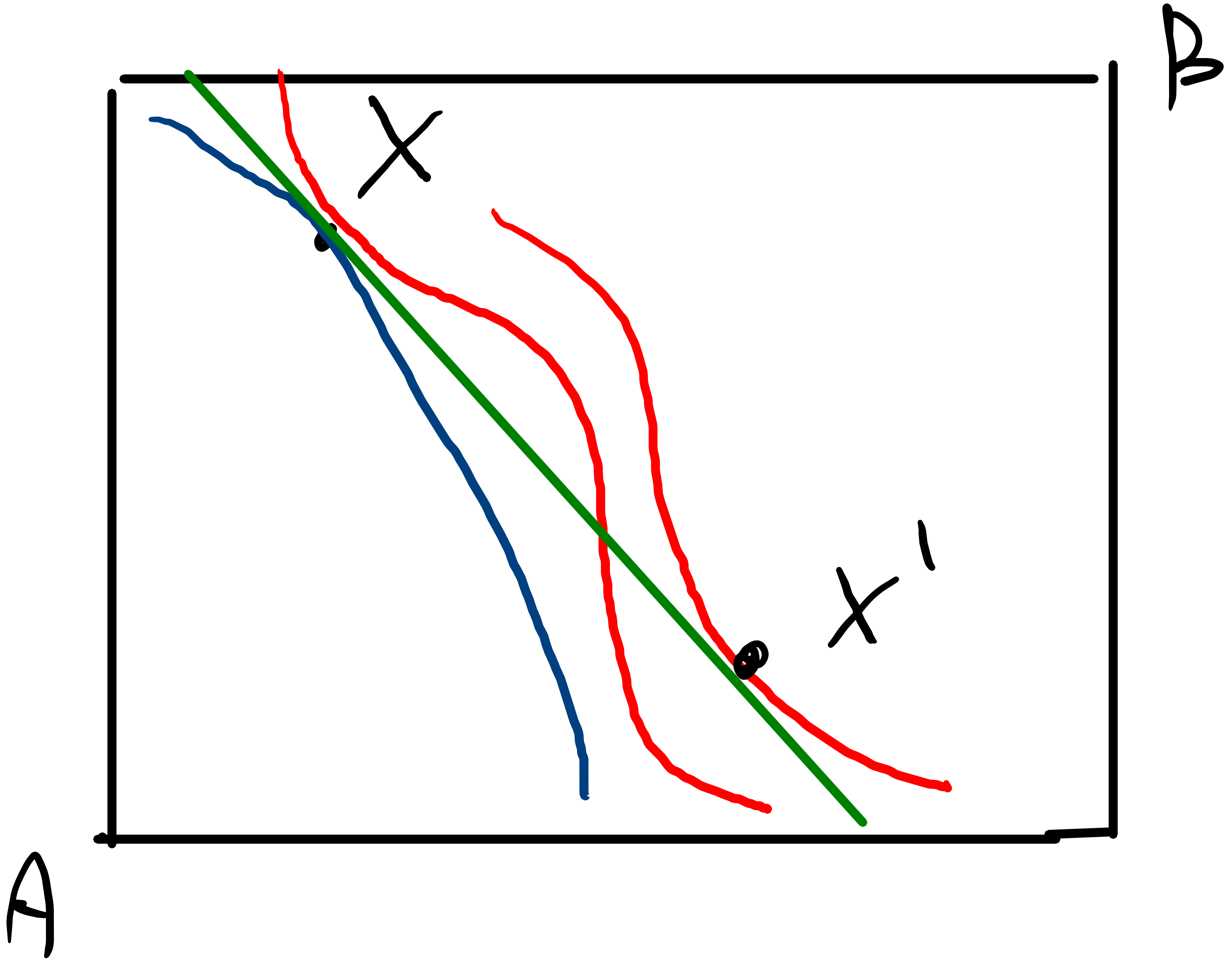
2nd Welfare Theorem

if preferences are convex every Pareto efficient allocation X is a competitive equilibrium at some endowment ω and prices (p_1^*, p_2^*)



X Pareto effic $\longrightarrow$

$$MRS^A(X) = MRS^B(X) = -p_1/p_2$$



at prices p_1, p_2

s.t. $\dfrac{p_1}{p_2} = |MRS^A(x)| = |MRS^B(x)|$

X is Pareto efficient but X is not implementable as a market equilibrium (competitive)

this is caused by non convexity of A' preference prices — allocative role → signal trade opportunities

prices — distributive role → how much agents consume