(ω_1^A, ω_2^A) dotação inicial do cons. A

$$\max U_A(x_1^A, x_2^A) \text{ sujeito a}$$

$$\begin{cases} p_1 x_1^A + p_2 x_2^A \leq p_1 \omega_1^A + p_2 \omega_2^A \\ x_1^A, x_2^A \geq 0 \end{cases}$$

$$\Rightarrow \quad x_1^A(p_1, p_2, p_1\omega_1^A + p_2\omega_2^A)$$

$$x_2^A(p_1, p_2, p_1\omega_1^A + p_2\omega_2^A)$$

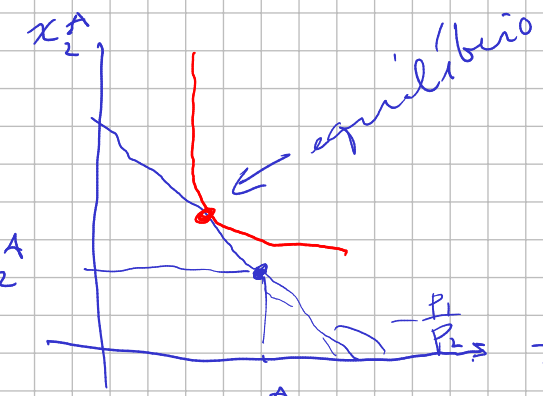
$$\max U_B(x_1^B, x_2^B) \text{ sujeito a}$$

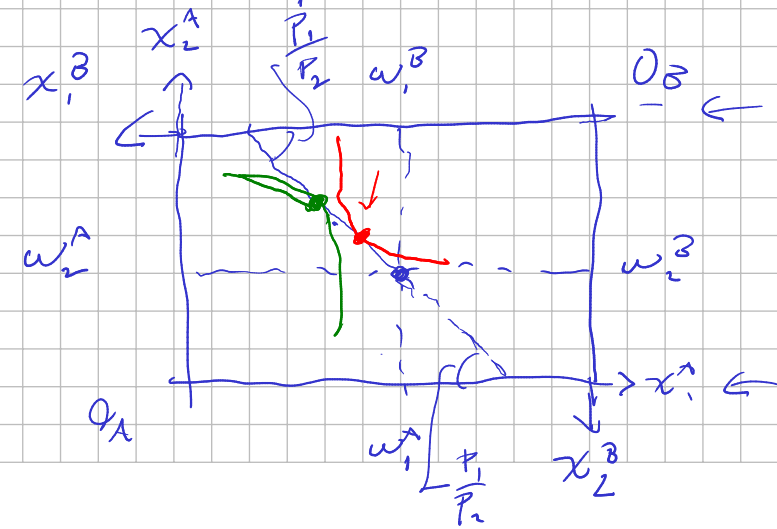
$$\begin{cases} p_1 x_1^B + p_2 x_2^B \leq p_1 \omega_1^B + p_2 \omega_2^B \\ x_1^B, x_2^B \geq 0 \end{cases}$$

$$\Rightarrow \quad x_1^B(p_1, p_2, p_1\omega_1^B + p_2\omega_2^B)$$

$$x_2^B(p_1, p_2, p_1\omega_1^B + p_2\omega_2^B)$$

$x_1(p_1, p_2, m)$





$U_A = 2 x_A^{0.2} y_A^{0.3}$ $\quad \omega_x^A = 10 \quad \omega_y^A = 2.5$

$U_B = 3 x_B^{0.5} y_B^{4.5}$ $\quad \omega_x^B = 10 \quad \omega_y^B = 20$

$$x_A(p_x, p_y) = \frac{2}{5} \frac{10 p_x + 2{,}5 p_y}{p_x} \qquad y_A = \frac{3}{5} \frac{10 p_x + 2{,}5 p_y}{p_y} = 6 \frac{p_x}{p_y} + \frac{3}{2}$$

$$x_B(p_x, p_y) = \frac{1}{10} \frac{10 p_x + 20 p_y}{p_x} \qquad y_B = \frac{9}{10} \frac{10 p_x + 20 p_y}{p_y} = 9 \frac{p_x}{p_y} + 18$$

Cond. equilíbrio no mercado do bem X:

$$\frac{2}{5} \frac{10 p_x + 2{,}5 p_y}{p_x} + \frac{1}{10} \frac{10 p_x + 20 p_y}{p_x} = 20$$

$$4 + \frac{p_y}{p_x} + 1 + 2 \frac{p_y}{p_x} = 20$$

$$3 \frac{p_y}{p_x} = 15 \qquad \boxed{\frac{p_y}{p_x} = 5}$$

Cond. de equil. no mercado do bem Y:

$$y_A() + y_B() = \omega_B$$

$$15 \frac{p_x}{p_y} + \frac{39}{2} = \frac{45}{2}$$

$$30 \frac{p_x}{p_y} + 39 = 45$$

$$\boxed{\frac{p_x}{p_y} = \frac{1}{5}}$$