

Zadanie 3. VII

$$U_1(x, y) = 2x^{0,5} + 4y$$

$$U_2(x, y) = x + y^{0,5}$$

$$MRS_1 = (2 \cdot 0,5 \cdot x_1^{-0,5}) / 4 = \frac{1}{4 \cdot x_1^2} = 1/p_y \quad \Rightarrow x_1 = \frac{p_y^2}{16}$$

$$MRS_2 = 1 / 0,5 \cdot y_2^{-0,5} = 2y_2^{0,5} = 1/p_y \quad \Rightarrow y_2 = \frac{1}{4p_y^2}$$

$$x_1 + x_2 = 30 \text{ (z prawa Walras)}$$

$$p_x \cdot x_1 + p_y \cdot y_1 = p_x \cdot 10 + p_y \cdot 10$$

$p_x = 1$, bo jest numeraire

$$x_1 + p_y \cdot y_1 = 10 + p_y \cdot 10$$

$$\frac{p_y^2}{16} + p_y \cdot \left(30 - \frac{1}{4p_y^2}\right) = 10 + 10p_y$$

$$\frac{p_y^2}{16} + 30p_y - \frac{1}{4p_y} = 10 + 10p_y$$

$$\frac{p_y^3}{16} + 20p_y^2 - \frac{1}{4} = 10p_y$$

$$p_y^3 + 320p_y^2 - 160p_y - 4 = 0 \quad \text{i} \quad p_y > 0$$

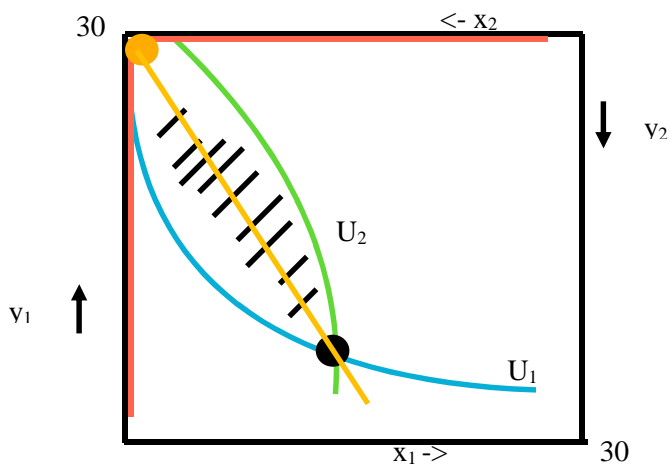
$p_y = 0,52$

$$x_1 = \frac{p_y^2}{16} = \frac{(0,52)^2}{16} = 0,02$$

$$x_2 = 30 - x_1 = 30 - 0,02 = 29,98$$

$$y_2 = \frac{1}{4p_y^2} = \frac{1}{4 \cdot (0,52)^2} = 0,92$$

$$y_1 = 30 - y_2 = 30 - 0,92 = 29,08$$



— Krzywa kontraktu
 — Linia budżetu

- Punkt B ($x_1 = 0,02$; $x_2 = 29,98$; $y_1 = 29,08$; $y_2 = 0,92$)
- Punkt A - zasób początkowy (10, 20, 10, 20)

Krzywą kontraktu otrzymujemy z:

$$MRS_1 = MRS_2$$

$$\frac{1}{4x_1^2} = 2y_2^{\frac{1}{2}}$$

$$\frac{1}{16x_1} = 4y_2 = 4(30 - y_1)$$

$$1 = 64x_1(30 - y_1) = 1920x_1 - 64x_1y_1$$

$$y_1 = \frac{1920x_1 - 1}{64x_1} \quad \text{krzywa kontraktu}$$

Równowagowa relacja cen:

$$\frac{p_x}{p_y} = \frac{1}{0,52} = 1,92$$