Podejście 3

$$L(x,y,\lambda_1,\lambda_2) = xy + 2y + \lambda_2(0+y) + \lambda_1\left(2 - \tfrac{1}{2}x^2 - y\right) =$$
$$= xy + 2y + \lambda_1\left(-\tfrac{1}{2}x^2 - y + 2\right) + \lambda_2 y$$

max $xy + 2y$

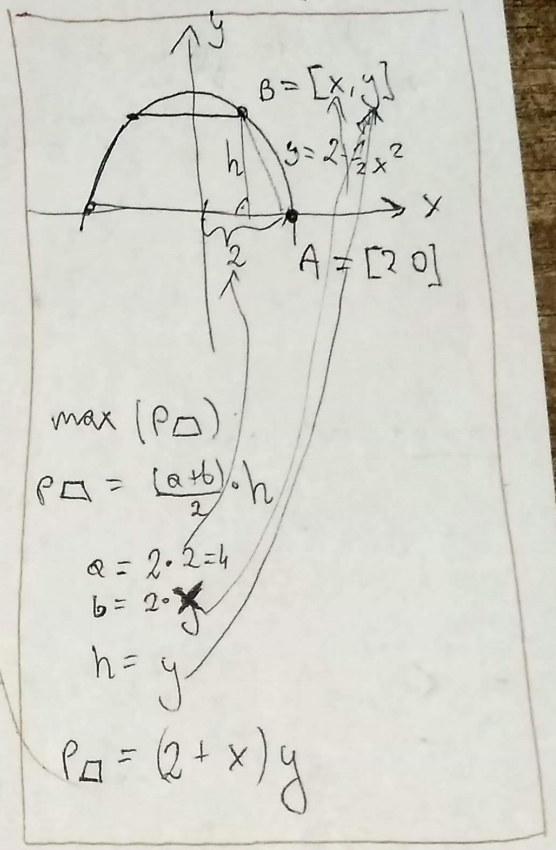
s.t.: $y = 2 - \frac{1}{2}x^2$

~~$y \geq 0$~~

$-y < 0$

c1: $\frac{\partial L}{\partial x} = y + \lambda_1 x = 0$

c2: $\frac{\partial L}{\partial y} = x + 2 - \lambda_1 + \lambda_2 = 0$



max $(P\square)$

$P\square = \frac{(a+b)}{2} \cdot h$

$a = 2 \cdot 2 = 4$

$b = 2 \cdot y$

$h = y$

$P\square = (2 + x)y$

complexity constrait 1:

$\lambda_1\left(-\frac{1}{2}x^2 - y + 2\right) = 0$

complexity constrait 2:

$\lambda_2 y = 0$

scenario 1: both constrains active

$-\frac{1}{2}x^2 - y + 2 = 0 \quad \wedge \quad y = 0$

$\lambda_1 > 0 \qquad \lambda_2 > 0$

$x = 2$ and $x = -2$

$y = 2 - \frac{1}{2}x^2$

$0 = 2 - \frac{1}{2}x^2$

$\frac{1}{2}x^2 = 2$

$x^2 = 4$

$|x| = 2$

$x = 2 \vee x = -2$

cond 1:

$\lambda_1\left(-\frac{1}{2} \cdot 4 + 2\right) = 0$

$\lambda_1(-2 + 2) = 0$

$\lambda_1 = 0$ can't be, because of

scenario 2: first slack, second active

$-\frac{1}{2}x^2 - y + 2 > 0 \quad \wedge \quad y = 0$

$\lambda_1 = 0 \qquad \lambda_2 > 0$

comp cond 1:

$0 \cdot \ldots = 0$

comp cond 2:

$\lambda_2 \cdot y = 0$

$0 \cdot y = 0$

$y < -\frac{1}{2}x^2 + 2$

$0 < -\frac{1}{2}x^2 + 2$

$-2 < -\frac{1}{2}x^2 \quad / \cdot (-2)$

$4 > x^2$

$|x| < 2$

$x < 2 \wedge x > -2$

c1: $0 - 0 \cdot x = 0$

c2: $x + 2 - 0 + \lambda_2 = 0$

$x + \lambda_2 = -2$

$\lambda_2 = \underbrace{-2 - x}_{>0}$

$-2 - x > 0$

$x < -2$

$x \in \emptyset$