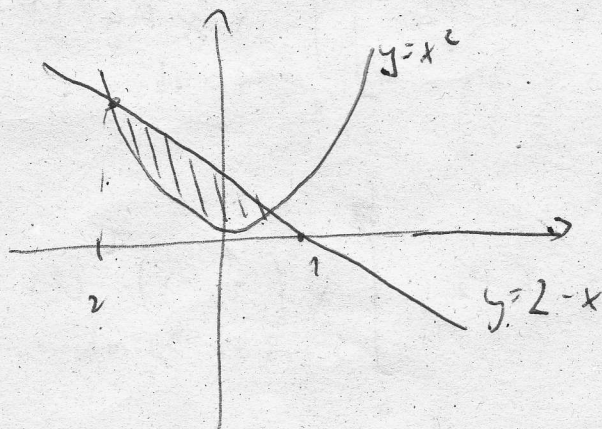


$$= 4\sqrt{2} \left[\frac{1}{4} - \frac{3}{8} + \frac{1}{4\sqrt{2}} - \frac{1}{10} \right] = 4\sqrt{2} \left[\frac{12-18+12-3}{48} \right] \cdot 4\sqrt{2}$$

$$= \frac{3 \cdot 4 \cdot \sqrt{2}}{48} = \frac{\sqrt{2}}{4}$$

$$[x_0, y_0] = \left[\frac{2}{\sqrt{2}}, \frac{\sqrt{2}}{4} \right] \Rightarrow \text{souřadnice těžiště}$$

Př. 10. Určete souřadnice těžiště destičky ohraničené grafy $y=x^2$; $x+y=2$



$$M = \int_{-2}^1 \int_{x^2}^{2-x} dy dx = \int_{-2}^1 [2-x-x^2] dx = \left[2x - \frac{x^2}{2} - \frac{x^3}{3} \right]_{-2}^1 =$$

$$= 2 - \frac{1}{2} \cdot \frac{1}{3} + 4 - \frac{4}{2} - \frac{8}{3} = 5 - \frac{1}{2} = \frac{9}{2}$$

$$x_0 = \frac{2}{9} \int_{-2}^1 \int_{x^2}^{2-x} x dy dx = \frac{2}{9} \int_{-2}^1 [xy]_{x^2}^{2-x} = \frac{2}{9} \int_{-2}^1 2x - x^2 - x^3 dx$$

$$= \frac{2}{9} \left[1 - \frac{1}{3} - \frac{1}{4} - 4 - \frac{8}{5} - 4 \right] = \frac{2}{9} \left[-2 - \frac{1}{4} \right] = -\frac{1}{2}$$