

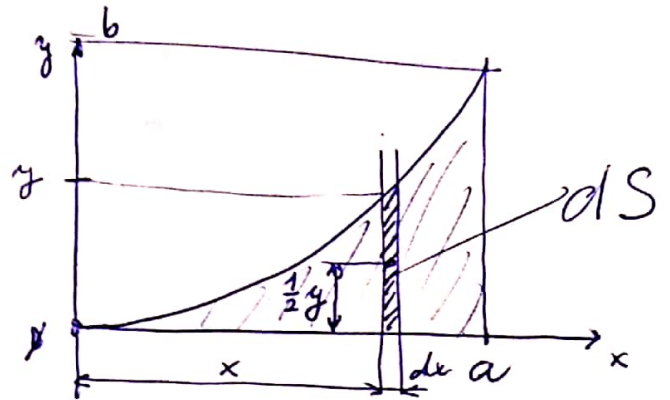
# TĚŽIŠTE PLOCHY (PARABOLA)

①

Dámt:

parabola:  $y = kx^2$ ,  
 $a, b$

Učte:  $x_T, y_T$



dopřítome koeficient  $k$ :

$$y = kx^2 \quad \text{bod } [a; b]$$

$$b = ka^2 \Rightarrow k = \frac{b}{a^2}; \quad \underline{y = \frac{b}{a^2} x^2}$$

$x$ -ová plocha těžiště:  $dS = y \cdot dx$

Rovinná statická moment plochy:

$$\underbrace{S \cdot x_T}_{U_y} = \underbrace{\int_{(S)} x dS}_{U_y}$$

Plocha obrazce:

$$S = \int_{(S)} dS = \int_0^a y dx =$$

$$= k \int_0^a x^2 dx = k \frac{1}{3} [x^3]_0^a = \frac{1}{3} ka^3 = \frac{1}{3} \frac{b}{a^2} \cdot a^3 = \underline{\underline{\frac{1}{3} ab}}$$

Statický moment plochy kolem osy  $y$ :

$$U_y = \int_{(S)} x dS = \int_0^a x y dx = k \int_0^a x^3 dx = k \frac{1}{4} [x^4]_0^a =$$

$$= k \frac{1}{4} a^4$$

$$\rightarrow x_T = \frac{U_y}{S} = \frac{k \frac{1}{4} a^4}{\frac{1}{3} ka^3} = \underline{\underline{\frac{3}{4} a}}$$

y - má' amáduice kórtte:

Rov. rovnáhy > hok chý' de nurekú hokou ony x:

$$S \cdot y_T = \int_{(S)} \frac{1}{2} y dS$$

$\underbrace{\hspace{2em}}_{U_x} \qquad \underbrace{\hspace{2em}}_{U_x}$

$$U_x = \int_{(S)} \frac{1}{2} y dS = \frac{1}{2} \int_0^a y^2 dx = \frac{1}{2} k^2 \int_0^a x^4 dx =$$

$$= \frac{1}{2} k^2 \frac{1}{5} [x^5]_0^a = \frac{1}{10} k^2 a^5$$

$$y_T = \frac{U_x}{S} = \frac{\frac{1}{10} k^2 a^5}{\frac{1}{3} k a^3} = \frac{3}{10} k a^2 = \frac{3}{10} \frac{b}{a^2} a^2 = \underline{\underline{\frac{3}{10} b}}$$

---


$$T [x_T, y_T] \quad x_T = \frac{3}{4} a \quad ; \quad y_T = \frac{3}{10} b$$