

$$x, y \in \langle 1, 5 \rangle$$

$$x+y=6$$

$$xy^2$$

1. nejmenší  
2. max

$$x = 6 - y$$

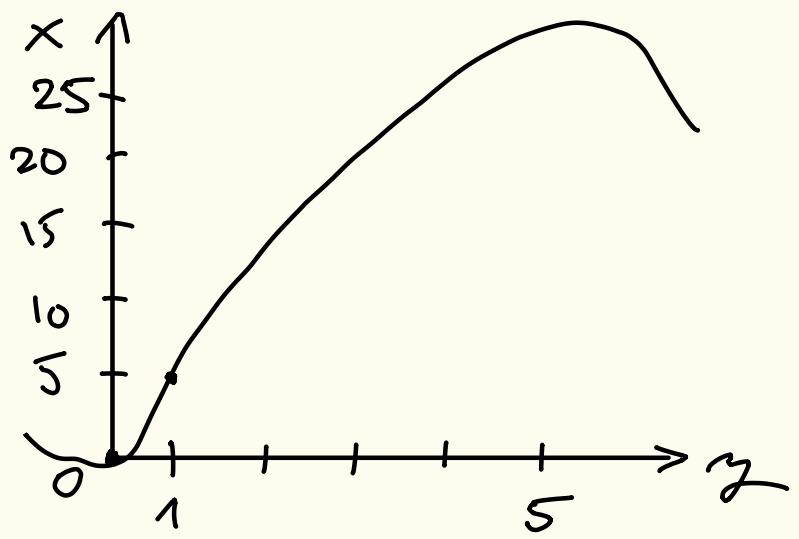
$$(6-y)y^2$$

$$f(y) = 6y^2 - y^3$$

$$f'(y) = 12y - 3y^2 = 0$$

$$y(12 - 3y) = 0 \quad \begin{cases} y=0 \\ y=4 \end{cases}$$

$$f''(y) = 12 - 6y \quad \begin{cases} 12 & |_0 \text{ min v B} \\ -12 & |_4 \text{ max v L} \end{cases}$$



Výsledek extreムu

$$1. f''$$

$$2. náhled na f$$

$$3. f'$$

$$\min \{ x^2 + y^2 \mid x \geq 0, xy \geq 1 \}$$

$$f(x) = x^2 + \frac{1}{x^2}$$

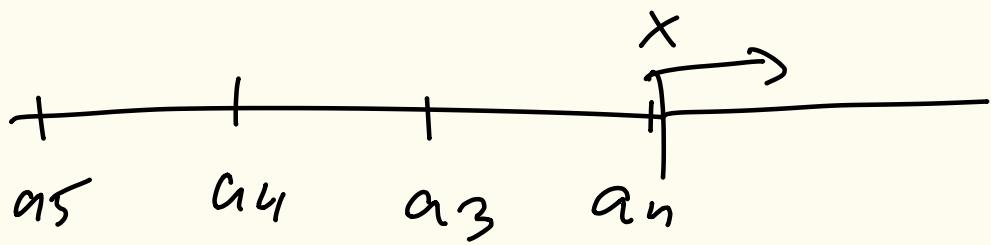
$$f'(x) = 2x - 2x^{-3} = 0$$

$$2x^4 - 2$$

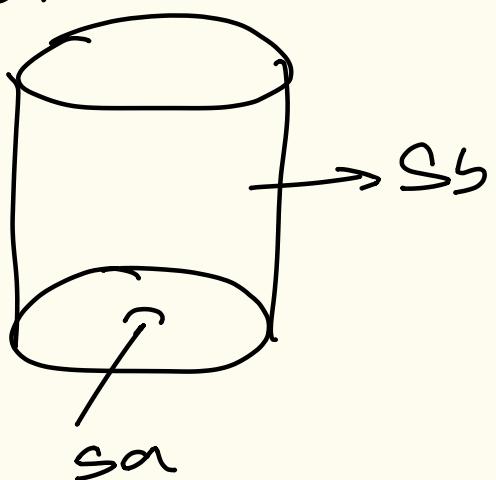
$$x^4 = 1 \quad \Rightarrow (x=1, y=1)$$

$$a_1 \dots a_n \in \mathbb{R}^n$$

$$\min \{x \mid x = a_i \text{ für } i=1 \dots n\}$$



$$V=0,5 \text{ l}$$



$$\min \{ S_a + S_b \mid V = 0,5 \text{ l} \}$$

$$S_a = \pi r^2$$

$$S_b = 2\pi r v$$

$$\pi r^2 + 2\pi r v =$$

$$= \pi r^2 + 2\pi r \cdot \frac{Q}{r^2} d \quad \}$$

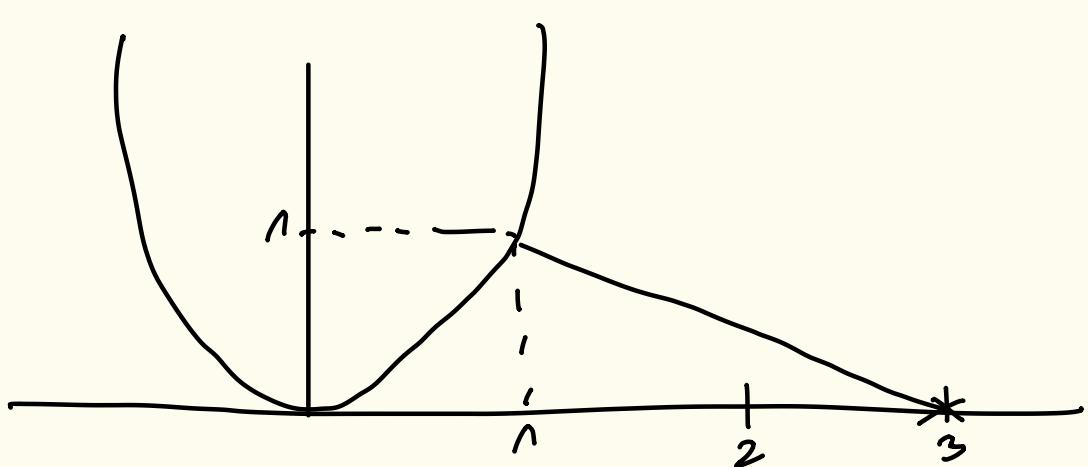
$$\text{Differenz: } 2\pi r - \frac{2\pi Q}{r^2} = 0 \quad \}$$

$$V = \pi r^2 v$$

$$v = \frac{V}{\pi r^2} = \frac{Q}{r^2}$$

$$r = \frac{Q}{r^2} \Rightarrow r^3 = Q \quad r = \sqrt[3]{Q}$$

$$v = \frac{Q}{r^2} = \frac{Q}{\sqrt[3]{Q^2}} = \sqrt[3]{Q} = r$$



$y = x^2$   
hledáme bod na p. kružnici  
je tojdeřík (3, 0)

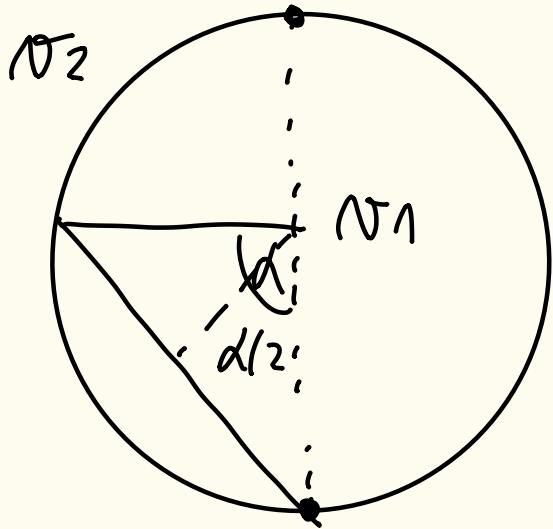
$$d = \sqrt{(x-x_0)^2 + (y-y_0)^2}$$

$$d = \sqrt{(x-3)^2 + x^4}$$

$$\min_x d(x), \text{ start minimalizovat } d^2(x) = (x-3)^2 + x^4$$

$$\min((x-3)^2 + x^4)$$

$$f'(x) = 2(x-3) + 4x^3 = 0 \quad \boxed{x=1} \\ + 2 \text{ complex roots}$$



$v_1 \dots \text{pluse}$

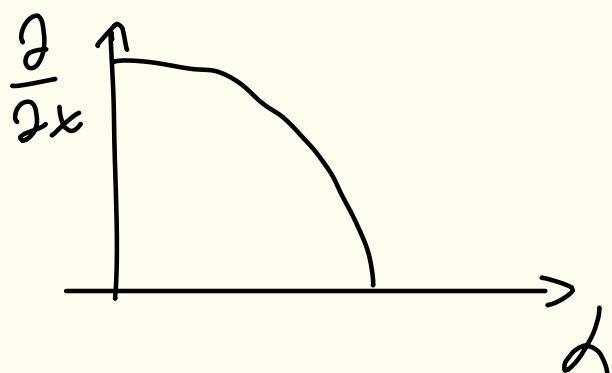
$v_2 \dots \text{bch}$

$$t_1 = \frac{s_1}{v_1} = \frac{2 \sin \frac{\alpha}{2}}{v_1}$$

$$t_2 = \frac{s_2}{v_2} = \frac{\pi - \alpha}{v_2}$$

$$\min : t_1 + t_2 = \frac{2 \sin \frac{\alpha}{2}}{v_1} + \frac{\pi - \alpha}{v_2}$$

$$\frac{\partial}{\partial \alpha} = \frac{\cos \frac{\alpha}{2}}{v_1} - \frac{1}{v_2} = 0 \Rightarrow \cos \frac{\alpha}{2} = \frac{v_1}{v_2}$$



$$x_1 \dots x_n \quad x_i \in \{-1, 1\}$$

$$\min \left\{ \sum_{i=1}^n x_i \mid \prod_{i=1}^n x_i > 0 \right\}$$

$$\text{n súd: } t_i: x_i = -1 \quad \begin{matrix} \text{válikben} \\ \swarrow \quad \searrow \end{matrix} \quad \text{n možnosti}$$

$$\text{n lich: } t_i: x_1 = 1, x_2 \dots x_n = -1$$