

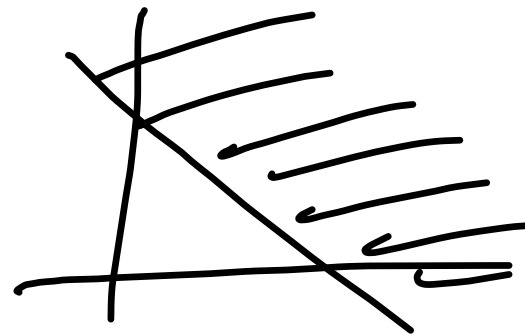
$$\frac{x}{a} + \frac{y}{\sqrt{l^2 - a^2}} - 1 = 0$$

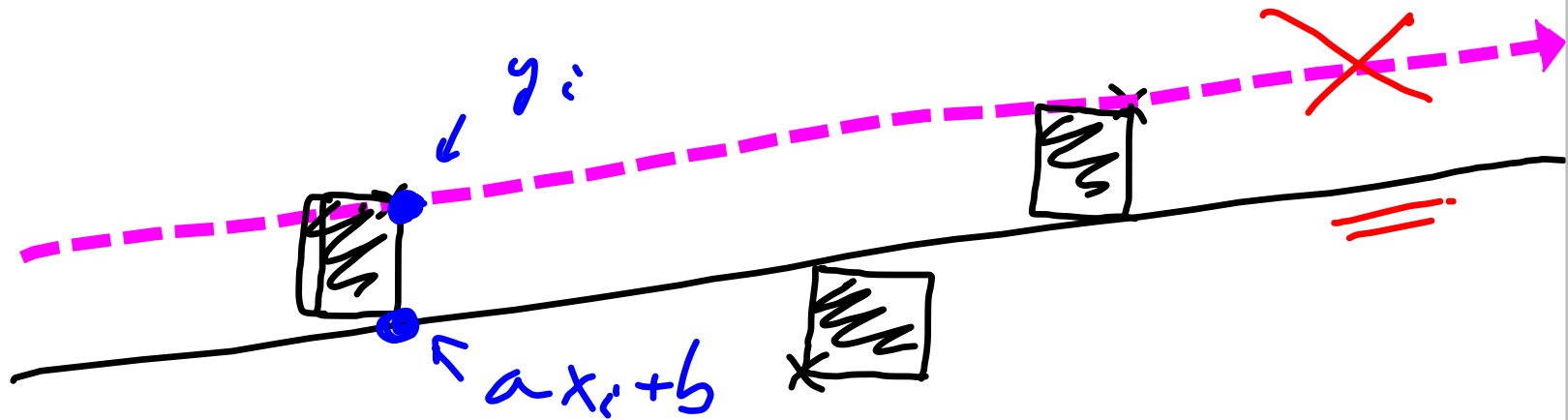
$$\frac{p}{a} + \frac{q}{\sqrt{l^2 - a^2}} - 1 \Rightarrow 0$$

- (i) ZVĚTŠIT  $p, q$
- (ii) ZKRAČIT.  $\bar{z}$ .

$$\frac{x}{6} + \frac{y}{6} = 1$$

$$x + y \Rightarrow 6$$





$$y = ax + b, \quad [x_i, y_i]$$

$$\sum_i (ax_i + b - y_i)^2 = f(a, b) \rightarrow \underline{\underline{\text{min}}}$$

$$f(a,b) = (a+b-1)^2 + (2a+b-0)^2 + \\ + (0a+b-3)^2 + (-2a+b-5)^2$$

$$f'_a(a,b) = 2 \cdot (a+b-1) \cdot 1 + 2 \cdot (2a+b) \cdot 2 + \\ + 0 + 2 \cdot (-2a+b-5) \cdot (-2) = \\ = \underline{18a + 2b + 18 = 0}$$

$$f'_b(a,b) = 2 \cdot (a+b-1) + 2 \cdot (2a+b) + \\ + 2(b-3) + 2 \cdot (-2a+b-5) = \underline{2a + 8b - 18 = 0}$$

$$9a + b - 9 = 0 \quad \dots (1)$$

$$a + 4b - 9 = 0 \quad \dots (2)$$

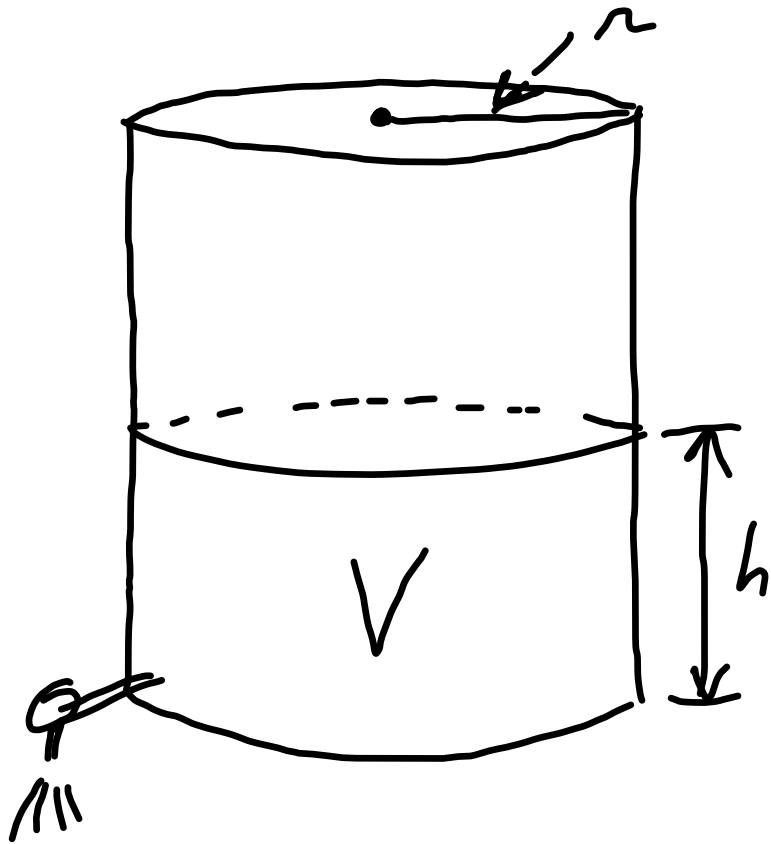
$$4 \cdot (1) - (2) \Rightarrow 35a + 54 = 0$$

$$a = -\frac{54}{35}$$

$$(1) \Rightarrow b = -9a - 9 = \frac{9 \cdot 54}{35} - 9 =$$

$$= -\frac{171}{35}$$

$$y = -\frac{54}{35}x - \frac{171}{35}$$



$$\left. \begin{array}{l} V [l] \\ h [m] \end{array} \right\} \text{nevište}$$

$$\underline{r [m], t [min]}$$

$$\frac{dV}{dt} = -3000$$

$$\text{hledáme: } \frac{dh}{dt}$$

$$V = \underbrace{1000 \cdot \pi r^2 \cdot h}_{1 \text{ m}^3 = 1000 \text{ l}} \quad / \quad \frac{d}{dt}$$

$$\frac{dV}{dt} = 1000 \pi r^2 \frac{dh}{dt}$$

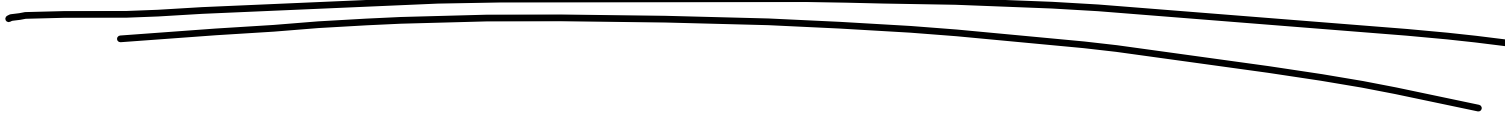
$$-3000 = 1000 \pi r^2 \frac{dh}{dt}$$

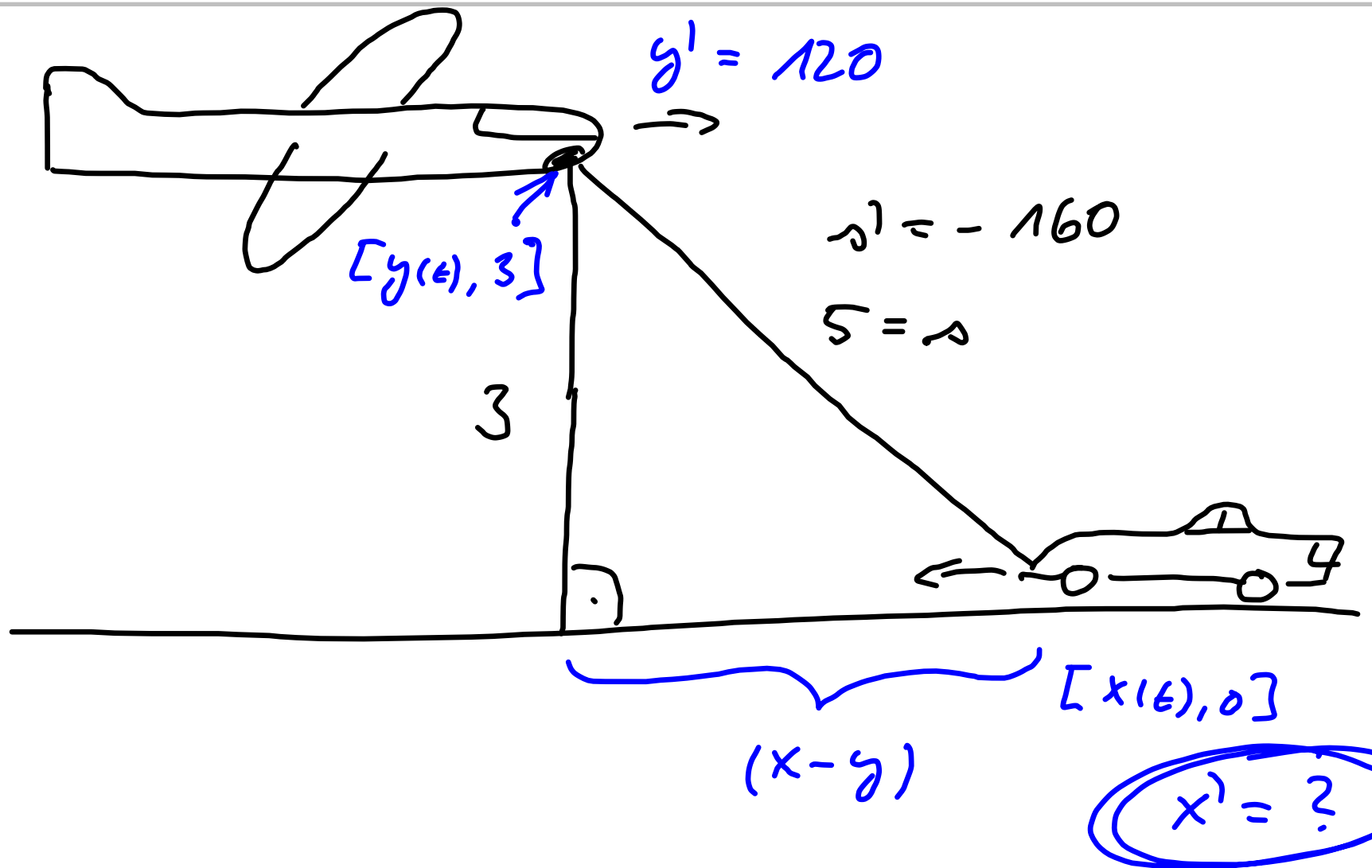
$$\Rightarrow \frac{dh}{dt} = \ominus \frac{3}{\pi r^2} \quad [\text{m}/\text{min}]$$

↓  
KLESA'

$$r = 1 \text{ m} \quad \Rightarrow \quad \frac{dL}{dt} = \frac{-3}{\pi} \approx -0,45$$

$$r = 10 \text{ m} \quad \Rightarrow \quad \frac{dL}{dt} = \frac{-3}{100\pi} \approx -0,0095$$







$$(x-y)^2 + 3^2 = r^2 \quad / \frac{d}{dt}$$

$$2 \cdot (x-y) \cdot (x' - y') = 2 \cdot r \cdot r'$$

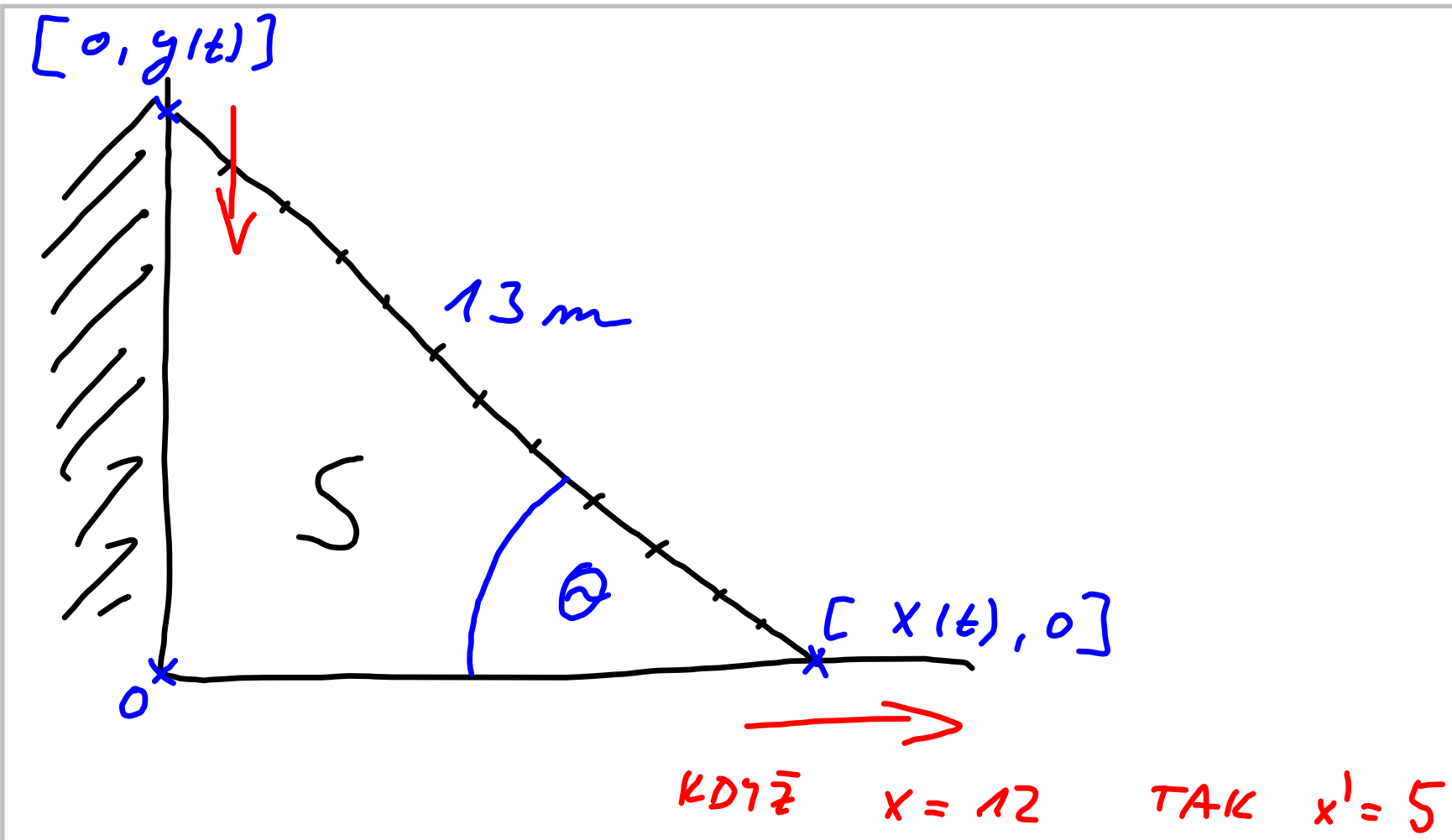
$$(\text{při } r=5 \text{ je } x-y=4)$$

$$2 \cdot 4 \cdot (x' - 120) = 2 \cdot 5 \cdot (-160)$$

$$x' - 120 = -5 \cdot 40 = -200$$

$$\underline{\underline{x' = -80 \text{ [km/h]}}}$$

Auto se k let. přiblí. vychl. 80 km/h.



$$x^2 + y^2 = 13^2 \quad (NA + 2A'v.: x, y, S, \theta)$$

$$S = \frac{1}{2} x y$$

$$\nabla_{\theta} \ominus = \frac{y}{x}$$


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$$a) \quad x^2 + y^2 = 13^2 \quad / \frac{d}{dt}$$

$$2x \cdot x' + 2y \cdot y' = 0$$

$$x \cdot x' + y \cdot y' = 0$$

$$12 \cdot 5 + \boxed{5} \cdot y' = 0$$

$$y(0) = ?$$

$$x(0) = 12$$

$$\frac{x^2 + y^2 = 13^2}{x^2 + y^2 = 13^2}$$

$$y^2 = 13^2 - 12^2$$

$$y^2 = 25$$

$$\boxed{y = 5}$$

$$12 \cdot 5 + 5 \cdot y' = 0 \Rightarrow y' = -12 \text{ [m/s]}$$

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a)  $\vec{z}$ . klesá po dráze  $\rightarrow$  chl. 12 m/s.

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$$b) S = \frac{1}{2} x y \quad / \frac{d}{dt}$$

$$S' = \frac{1}{2} \cdot (x' \cdot y + x \cdot y')$$

$$S' = \frac{1}{2} \cdot (5 \cdot 5 - 12 \cdot 12) = -\frac{119}{2}$$

$$S' = -59,5 \text{ [m}^2\text{/s]}$$

0 SE zmenš.
Rýchl. 59,5 m <sup>2</sup> /s

$$c) \quad \arcsin \theta = \frac{y}{x} \quad / \quad \frac{d}{dt}$$

$$\frac{1}{\cos^2 \theta} \cdot \theta' = \frac{y' \cdot x - y \cdot x'}{x^2}$$

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$$x = 12, \quad y = 5 \Rightarrow \arcsin \theta = \frac{5}{12}$$

$$\text{z obr. : } \cos \theta = \frac{12}{13}$$

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$$\frac{1}{\left(\frac{12}{13}\right)^2} \cdot \theta' = \frac{-12 \cdot 12 - 5 \cdot 5}{12^2}$$

$$\theta' = \frac{\cancel{12^2}}{13^2} \cdot \frac{-12^2 - 5^2}{\cancel{12^2}} = \frac{-169}{169} = \underline{\underline{-1}}$$

Uhel se zmenšuje v důsledku  
 $\pi$  rad / s.

$$\left( 180^\circ = \pi \text{ rad} \Rightarrow \pi \text{ rad} \doteq 57^\circ \right)$$