Zadatak 53. Parabola $y^2 = 3x$ dijeli kružnicu $x^2 + y^2 = 4$ na dva luka. U kojem su omjeru duljine tih lukova?

Rješenje.

$$P \ \ldots \ y^2 = 3x$$
$$k \ \ldots \ x^2 + y^2 = 4$$
$$P \cap k \ \ldots \ x^2 + 3x = 4$$
$$x^2 + 3x - 4 = 0$$
$$x_{1,2} = \frac{-3 \pm \sqrt{9+16}}{2} = \frac{-3 \pm 5}{2}$$
$$x_1 = -4 \text{ (nije rješenje)}$$
$$x_0 = 1$$
$$y^2 = 3 \cdot 1 \implies y = \pm\sqrt{3} \implies T(1, \pm\sqrt{3})$$
$$d(O, T_1) = \sqrt{1^2 + \sqrt{3}^2} = 2$$
$$d(A, T_1) = \sqrt{(2-1)^2 + (0-\sqrt{3})^2} = 2$$
$$\triangle OAB_1 \text{ jednakokračan} \implies \sphericalangle AOT_1 = 60^\circ$$
$$\overset{\frown}{T_1T_2} \ \ldots \ l_1 = \frac{2r\pi \cdot 2\sphericalangle AOT_1}{360^\circ} = \frac{4\pi \cdot 2 \cdot 60^\circ}{360^\circ} = \frac{4\pi}{3}$$
$$l_2 = o - l_1 = 2r\pi - \frac{4\pi}{3} = \frac{8\pi}{3}$$
$$\frac{l_2}{l_1} = 2$$