Zadatak 9. Na pravcu $x+y-3=0$ odredi točku iz koje se dužina $\overline{AB}$, $A(-3,1)$, $B(6,-1)$ vidi pod kutom od 135°.

Rješenje.

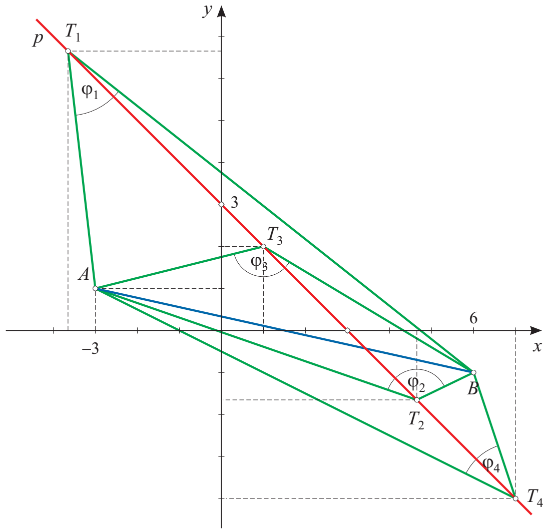
$$p \ \ldots \ x+y-3=0$$
$$a \ \ldots \ AT$$
$$b \ \ldots \ BT$$
$$T(r,s)$$
$$A(-3,1), \quad B(6,-1)$$
$$\varphi = \sphericalangle ATB = 135^\circ \implies \operatorname{tg}\varphi = |-1| = 1$$
$$T \in p \implies T(r,-r+3)$$
$$a \ \ldots \ y-1 = \frac{-r+3-1}{r+3}(x+3) = \frac{-r+2}{r+3}(x+3) \implies \boxed{k_a = \frac{-r+2}{r+3}}$$
$$b \ \ldots \ y+1 = \frac{-r+3+1}{r-6}(x-6) = \frac{-r+4}{r-6}(x-6) \implies \boxed{k_b = \frac{-r+4}{r-6}}$$
$$\operatorname{tg}\varphi = 1$$
$$\left|\frac{\frac{-r+2}{r+3} - \frac{-r+4}{r-6}}{1+\frac{-r+2}{r+3}\cdot\frac{-r+4}{r-6}}\right| = |-1|$$
$$\left|\frac{\frac{(-r+2)(r-6)-(-r+4)(r+3)}{(r+3)(r-6)}}{\frac{(r+3)(r-6)+(-r+2)(-r+4)}{(r+3)(r-6)}}\right| = 1$$
$$\left|\frac{-r^2+6r+2r-12+r^2+3r-4r-12}{r^2-6r+3r-18+r^2-4r-2r+8}\right| = 1$$
$$\left|\frac{7r-24}{2r^2-9r-10}\right| = 1$$
$$|7r-24| = |2r^2-9r-10|$$
$$7r-24<0 \implies r < \frac{24}{7} \approx 3.4$$
$$2r^2-9r-10=0 \implies (r)_1 \approx -0.9, \quad (r)_2 \approx 5.4$$

$\boxed{x \in \langle -\infty, -0.9\rangle \cup \langle 3.4, 5.4\rangle}$

$$-7r+24 = 2r^2-9r-10$$
$$2r^2-2r-34=0 \quad / : 2$$
$$r^2-r-17=0$$
$$r_{1,2} = \frac{1\pm\sqrt{1+68}}{2} = \frac{1\pm\sqrt{69}}{2}$$
$$r_1 = \frac{1-\sqrt{69}}{2} \implies \boxed{T_1\left(\frac{1-\sqrt{69}}{2}, \frac{5+\sqrt{69}}{2}\right)}$$
$$r_2 = \frac{1+\sqrt{69}}{2} \implies \boxed{T_2\left(\frac{1+\sqrt{69}}{2}, \frac{5-\sqrt{69}}{2}\right)}$$

$\boxed{x \in \langle -0.9, 3.4\rangle \cup \langle 5.4, \infty\rangle}$

$$7r-24 = 2r^2-9r-10$$
$$2r^2-16r+14=0 \quad / : 2$$
$$r^2-8r+7=0$$
$$r_{3,4} = \frac{8\pm\sqrt{64-28}}{2} = \frac{8\pm 6}{2}$$
$$r_3 = \frac{8-6}{2} = 1 \implies \boxed{T_3(1,2)}$$
$$r_4 = \frac{8+6}{2} = 7 \implies \boxed{T_4(7,-4)}$$



Iz slike vidimo da je rješenje točka $T_2\left(\frac{1+\sqrt{69}}{2}, \frac{5-\sqrt{69}}{2}\right)$ ili $T_3(1, 2)$.