Zadatak 29. Koliki kut zatvaraju radijvektori točke s apscisom $x = -4$ elipse $9x^2 + 25y^2 = 225$?

Rješenje.

$$x = -4$$
$$9x^2 + 25y^2 = 225$$
$$9 \cdot 16 + 25y^2 = 225$$
$$25y^2 = 81$$
$$y = \pm\frac{9}{5}$$
$$T_{1,2}\left(-4, \pm\frac{9}{5}\right)$$
$$9x^2 + 25y^2 = 225 \quad / : 225$$
$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$
$$e^2 = a^2 - b^2 = 25 - 9 = 16 \implies e = 4$$

Izračunajmo koeficijent pravca F_1T_1:

$$F_1(-4, 0)$$
$$T_1(-4, -\frac{9}{5})$$
$$k_1 = \frac{-4+4}{-\frac{9}{5} - 0} = 0$$

Izračunajmo još koeficijent pravca F_2T_1:

$$F_2(4, 0)$$
$$T_1(-4, -\frac{9}{5})$$
$$k_2 = \frac{-4-4}{-\frac{9}{5} - 0} = \frac{-8}{-\frac{9}{5}} = \frac{40}{9}$$

$$\operatorname{tg} \sphericalangle(r_1, r_2) = \left|\frac{k_2 - k_1}{1 + k_1k_2}\right| = \left|\frac{\frac{40}{9} - 0}{1 + \frac{40}{9} \cdot 0}\right| = \left|\frac{40}{9}\right| = \frac{40}{9} \implies \sphericalangle(r_1, r_2) = 77°20'$$