Zadatak 3. U kojim točkama pravac $3x+10y-25=0$ siječe elipsu $\frac{x^2}{25}+\frac{y^2}{4}=1$?

Rješenje.

$$p \ \ldots \ 3x+10y-25=0 \implies x=-\frac{10}{3}y+\frac{25}{3}$$

$$E \ \ldots \ \frac{x^2}{25}+\frac{y^2}{4}=1 \quad / \cdot 100$$

$$4x^2+25y^2=100$$

$$p\cap E \ \ldots \ 4\left(-\frac{10}{3}x+\frac{25}{3}\right)^2+25y^2=100$$

$$4\left(\frac{100}{9}y^2-\frac{500}{9}y+\frac{625}{9}\right)^2+25y^2=100$$

$$\frac{400}{9}y^2-\frac{2000}{9}y+\frac{2500}{9}+25y^2-100=0 \quad / \cdot 9$$

$$400y^2-2000y+2500+225y^2-900=0$$

$$625y^2-2000y+1600=0 \quad / : 25$$

$$25y^2-80y+64=0$$

$$(5y-8)^2=0$$

$$5y-8=0$$

$$y=\frac{8}{5} \implies x=-\frac{10}{3}\cdot\frac{8}{5}+\frac{25}{3}=3 \implies D\left(3,\frac{8}{5}\right) \text{ (diralište)}$$

Pravac je tangenta elipse, a diralište je točka $\left(3,\frac{8}{5}\right)$.