Zadatak 36. Točka $T(2,1)$ polovište je tetive elipse $\frac{x^2}{25}+\frac{y^2}{16}=1$. Kako glasi jednadžba pravca kojem pripada ta tetiva?

Rješenje.

$$E \ \ldots \ \frac{x^2}{25}+\frac{y^2}{16}=1$$
$$T\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)=(2,1)$$
$$\Longrightarrow x_1+x_2=4$$
$$y_1+y_2=2$$

Točke $T_1(x_1,y_1)$ i $T_2(x_2,y_2)$ pripadaju elipsi pa je stoga

$$\frac{x_1^2}{25}+\frac{y_1^2}{16}=1 \quad /\cdot 400$$
$$\frac{x_2^2}{25}+\frac{y_2^2}{16}=1 \quad /\cdot 400$$
$$16x_1^2+25y_1^2=400$$
$$16x_2^2+25y_2^2=400$$

Oduzmemo li te jednadžbe, dobit ćemo

$$16(x_1^2-x_2^2)+25(y_1^2-y_2^2)=0$$
$$16(x_1-x_2)(x_1+x_2)+25(y_1-y_2)(y_1+y_2)=0$$
$$16(x_1-x_2)\cdot 4+25(y_1-y_2)\cdot 2=0 \quad /:2$$
$$32(x_1-x_2)+25(y_1-y_2)=0 \quad /:25(x_1-x_2)$$
$$\frac{32}{25}+\frac{y_1-y_2}{x_1-x_2}=0 \Longrightarrow \frac{y_1-y_2}{x_1-x_2}=-\frac{32}{25}$$

$-\frac{32}{25}$ je koeficijent smjera pravca na kojem leži tetiva. Dakle

$$k=-\frac{32}{25}$$
$$T(2,1)\in T_1T_2$$
$$T_1T_2 \ \ldots \ y-1=-\frac{32}{25}(x-2)$$
$$y-1=-\frac{32}{25}x+\frac{64}{25}$$
$$y+\frac{32}{25}x-\frac{89}{25}=0 \quad /\cdot 25$$
$$32x+25y-89=0$$