Zadatak 37. Odredi jednadžbu pravca točkom $T(3,-1)$, tako da ta točka bude polovište odsječka što ga pravac odsijeca na hiperboli $7x^2-3y^2=21$.

Rješenje.

$$T(3,-1)$$

$$H \ \ldots \ 7x^2-3y^2=21$$

T je polovište tetive AB $(A(x_1,y_1),\ B(x_2,y_2))$:

$$\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)=(3,-1)$$

$$\frac{x_1+x_2}{2}=3,\quad x_1+x_2=6 \implies x_2=6-x_1$$

$$\frac{y_1+y_2}{2}=-1,\quad y_1+y_2=-2 \implies y_2=-2-y_1$$

$$\{A\}\in H \ \ldots \ 7x_1^2-3y_1^2=21$$

$$\{B\}\in H \ \ldots \ 7x_2^2-3y_2^2=21$$

$$7x_1^2-3y_1^2=21$$

$$7(6-x_1)^2-3(-2-y_1)^2=21$$

$$7x_1^2-3y_1^2=21$$

$$7(36-12x_1+x_1^2)-3(4+4y_1+y_1^2)=21$$

$$7x_1^2-3y_1^2=21$$

$$252-84x_1+7x_1^2-12-12y_1-3y_1^2=21$$

$$\left.\begin{aligned}7x_1^2-3y_1^2&=21\\ 7x_1^2-3y_1^2-84x_1-12y_1&=-219\end{aligned}\right\}-$$

$$84x_1+12y_1=240 \quad /:12$$

$$7x_1+y_1=20 \implies \boxed{p \ \ldots \ 7x+y-20=0}$$