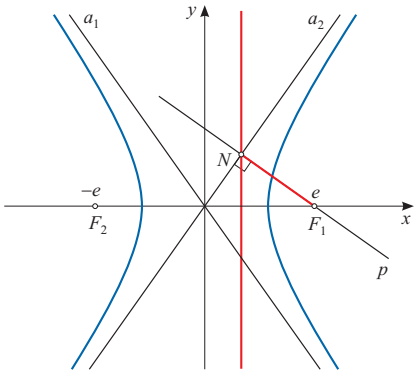
Zadatak 30. Dokaži da nožište okomice spuštene iz žarišta hiperbole na njezinu asimptotu leži na ravnalici.

Rješenje. *Tvrdnja:* nožište okomice spuštene iz žarišta hiperbole na njezinu asimptotu leži na ravnalici.



$$a_{1,2} \ \dots \ y = \pm\frac{b}{a}$$

$$H \ \dots \ \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

$$e^2 = a^2 + b^2$$

Pravac kroz F_2 okomit na a_2 $\left(k_{a_2} = \frac{b}{a}\right)$:

$$y - 0 = -\frac{1}{\frac{b}{a}}(x - e)$$

$$p \ \dots \ y = -\frac{a}{b}x + \frac{a}{b}e$$

$$\{N\} = p \cap a_2 \ \dots \ -\frac{a}{b}x + \frac{a}{b}e = \frac{b}{a}x$$

$$\frac{b}{a}x + \frac{a}{b}x = \frac{a \cdot e}{b}$$

$$\left(\frac{b}{a} + \frac{a}{b}\right)x = \frac{a \cdot e}{b}$$

$$x = \frac{\frac{a \cdot e}{b}}{\frac{b}{a} + \frac{a}{b}}$$

$$x = \frac{\frac{a \cdot e}{b}}{\frac{a^2 + b^2}{ab}}$$

$$x = \frac{\frac{a \cdot e}{1}}{\frac{e^2}{a}}$$

$$x = \frac{a^2}{e}$$

$$y = \frac{b}{a} \cdot \frac{a^2}{e}$$

$$y = \frac{ab}{e} \implies N\left(\frac{a^2}{e}, \frac{ab}{e}\right)$$

Ravnalice hiperbole su pravci:

$$r \ \ldots \ x = \pm\frac{a}{\varepsilon} \quad \left(\varepsilon = \frac{e}{a}\right)$$

$$x = \pm\frac{a}{\frac{e}{a}}$$

$$x = \pm\frac{a^2}{e} \implies N \in r$$