

Zadatak 28. Ravnalica hiperbole $b^2x^2 - a^2y^2 = a^2b^2$ siječe njezinu asimptotu u točki $T(4, 2)$. Napiši jednadžbu hiperbole.

Rješenje.

$$T(4, 2)$$

$$r \text{ (ravnalica)} \dots x = \pm \frac{a}{\varepsilon}$$

$$p \text{ (asimptota)} \dots y = \pm \frac{b}{a}x$$

$$\{T\} \in r \implies 4 = \frac{a}{\varepsilon}, \quad a = 4\varepsilon$$

$$\{T\} \in p \implies 2 = \frac{b}{a} \cdot 4, \quad b = \frac{1}{2}a$$

$$a = 4\varepsilon$$

$$a = 4 \frac{e}{a}$$

$$a^2 = 4e$$

$$e = \frac{a^2}{4}$$

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

$$\frac{a^4}{16} = a^2 + \frac{a^2}{4}$$

$$\frac{a^4}{16} = \frac{5a^2}{4} \quad / \cdot \frac{16}{a^2}$$

$$a^2 = 20$$

$$b = \frac{1}{2}a$$

$$b^2 = \frac{1}{4}a^2$$

$$b^2 = 5$$

$$H \dots \frac{x^2}{20} - \frac{y^2}{5} = 1$$