



**Zadatak 27.** Odredi jednadžbu hiperbole  $b^2x^2 - a^2y^2 = a^2b^2$  ako je pravac  $y = \frac{4}{3}x$  njezina asimptota, a pravac  $x = \frac{9}{5}$  njezina ravnalica. *Napomena.* Ravnalice hiperbole  $b^2x^2 - a^2y^2 = a^2b^2$  su pravci  $x = -\frac{a}{\varepsilon}$  i  $x = \frac{a}{\varepsilon}$  ( $\varepsilon = \frac{e}{a}$ ).

**Rješenje.**

$$y = \frac{4}{3}x \text{ (asimptota } y = \pm \frac{b}{a}x)$$

$$\Rightarrow \frac{b}{a} = \frac{4}{3}, \quad b = \frac{4}{3}a$$

$$x = \frac{9}{5} \text{ (ravnalica } x = \pm \frac{a}{\varepsilon})$$

$$\Rightarrow \frac{a}{\varepsilon} = \frac{9}{5}, \quad \varepsilon = \frac{5}{9}a$$

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

$$\frac{5}{9}a = \frac{e}{a}$$

$$e = \frac{5}{9}a^2$$

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

$$\frac{25}{81}a^4 = a^2 + \frac{16}{9}a^2$$

$$\frac{25}{81}a^4 = \frac{25}{9}a^2 \quad / \cdot \frac{81}{25a^2}$$

$$a^2 = 9$$

$$b^2 = \frac{16}{9} \cdot 9 \Rightarrow b^2 = 16$$

$$H \quad \dots \quad \frac{x^2}{9} - \frac{y^2}{16} = 1$$