— ◆ —

Zadatak 10. Udaljenost žarišta hiperbole $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$ jednaka je 20, a pravac $4x + 3y = 0$ je asimptota hiperbole. Nađi njezinu jednadžbu.

Rješenje.

$$2e = 20 = d(F_1, F_2) \implies \boxed{e = 10}$$

$$4x + 3y = 0 \ \ (\text{asimptota})$$

$$y = -\frac{4}{3}x \implies -\frac{b}{a} = -\frac{4}{3}, \qquad \boxed{b = \frac{4}{3}a}$$

$$a^2 = e^2 - b^2$$

$$a^2 = e^2 - \left(\frac{4}{3}a\right)^2$$

$$\frac{25}{9}a^2 = e^2$$

$$\frac{25}{9}a^2 = 100 \quad / \cdot \frac{9}{25}$$

$$\boxed{a^2 = 36} \implies a = 6$$

$$b = \frac{4}{3} \cdot 6 = 8 \implies \boxed{b^2 = 64}$$

$$\boxed{H} \ \ \ldots \ \ \boxed{\frac{x^2}{36} - \frac{y^2}{64} = 1}$$