

Zadatak 8. Na hiperboli $\frac{x^2}{64} - \frac{y^2}{36} = 1$ odredi točku koja je od njezinog desnog žarišta udaljena 4.5.

Rješenje.

$$\frac{x^2}{64} - \frac{y^2}{36} = 1 \implies a = 8, \quad b = 6$$

$$\frac{x^2}{64} - \frac{y^2}{36} = 1 \quad / \cdot 576$$

$$9x^2 - 16y^2 = 576$$

$$e^2 = a^2 + b^2 = 64 + 36 = 100 \implies e = 10$$

$$F_1(-10, 0), \quad F_2(10, 0)$$

$$d(T, F_2) = 4.5$$

$$\sqrt{(x-10)^2 + (y-0)^2} = 4.5 \quad /^2$$

$$(x-10)^2 + y^2 = 20.25 \quad (1)$$

$$\{T\} \in H \dots 9x^2 - 16y^2 = 576$$

$$(1) \dots \frac{(x-10)^2 + y^2 = 20.25}{\cdot 16}$$

$$\left. \begin{array}{l} 9x^2 - 16y^2 = 576 \\ 16(x-10)^2 + 16y^2 = 324 \end{array} \right\} +$$

$$16x^2 - 320x + 1600 + 9x^2 = 900$$

$$25x^2 - 320x + 700 = 0 \quad / : 5$$

$$5x^2 - 64x + 140 = 0$$

$$x_{1,2} = \frac{64 \pm 36}{10}$$

$$x_1 = 2.8 \notin H \quad (x \leq -8, x \geq 8)$$

$$x = 10$$

$$9 \cdot 100 - 16 \cdot y^2 = 576$$

$$16 \cdot y^2 = 324 \quad / : 16$$

$$y^2 = \frac{81}{4} \quad / \sqrt{\quad}$$

$$y = \pm \frac{9}{2} \implies T_{1,2} \left(10, \pm \frac{9}{2} \right)$$