Zadatak 34. Tetiva parabole $y^2 = 2x$ što je odsijeca pravac $x - y - 4 = 0$ osnovica je jednakokračnog trokuta kojemu vrh leži na osi apscisa. Kolika je površina tog trokuta?

Rješenje.

$$P \ \dots \ y^2 = 2x$$

$$p \ \dots \ x - y - 4 = 0, \quad y = x - 4$$

$$P \cap p \ \dots \ (x-4)^2 = 2x$$

$$x^2 - 8x + 16 = 2x$$

$$x^2 - 10x + 16 = 0$$

$$x_{1,2} = \frac{10 \pm \sqrt{100 - 64}}{2} = \frac{10 \pm 6}{2}$$

$$x_1 = 2, \quad y_1 = x_1 - 4, \quad y_1 = -2 \implies T_1(2, -2)$$

$$x_2 = 8, \quad y_1 = x_1 - 4, \quad y_1 = 4 \implies T_2(8, 4)$$

$$T_3 \text{ na osi apscisa} \implies T_3(x_3, 0)$$

$$\text{trokut jednakokračan} \implies d(T_1, T_3) = d(T_2, T_3)$$

$$\sqrt{(2 - x_3)^2 + (-2)^2} = \sqrt{(8 - x_3)^2 + 4^2} \quad /^2$$

$$4 - 4x_3 + x_3^2 + 4 = 64 - 16x_3 + x_3^2 + 16$$

$$12x_3 = 72 \quad / : 12$$

$$x_3 = 6 \implies T_3(6, 0)$$

$$P_\triangle = \left|\frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]\right|$$

$$= \left|\frac{1}{2}[2(4 - 0) + 8(0 + 2) + 6(-2 - 4)]\right|$$

$$= \left|\frac{1}{2}(8 + 16 - 36)\right| = 6$$