

Zadatak 14. Točke $A_1(3, 2)$ i $C_1(1, 1)$ polovišta su stranica \overline{BC} i \overline{AB} trokuta ABC , a točka $T(-1, 3)$ težište je istog trokuta. Kolika je površina trokuta ABC ?

Rješenje.

$$A_1(3, 2), C_1(1, 1), T(-1, 3)$$

$$x_{A_1} = \frac{x_B + x_C}{2} = 3/ \cdot 2$$

$$y_{A_1} = \frac{y_B + y_C}{2} = 2/ \cdot 2$$

$$x_{C_1} = \frac{x_A + x_B}{2} = 3/ \cdot 2$$

$$y_{C_1} = \frac{y_A + y_B}{2} = 2/ \cdot 2$$

$$x_T = \frac{x_A + x_B + x_C}{3} = -1/ \cdot 3$$

$$y_T = \frac{y_A + y_B + y_C}{3} = 3/ \cdot 3$$

$$\overline{x_B + x_C = 6}$$

$$\overline{y_B + y_C = 4}$$

$$\overline{x_A + x_B = 2}$$

$$\overline{y_A + y_B = 2}$$

$$\overline{x_A + x_B + x_C = -3}$$

$$\overline{y_A + y_B + y_C = 9}$$

$$\overline{x_C - x_A = 4}$$

$$\overline{y_C - y_A = 2}$$

$$\overline{x_C = x_A + 4}$$

$$\overline{y_C = y_A + 2}$$

$$\overline{x_A + x_B = 2 \implies x_B = 2 - x_A}$$

$$\overline{y_A + y_B = 2 \implies y_B = 2 - y_A}$$

$$\overline{x_A + 2 - x_A + x_A + 4 = 3}$$

$$\overline{y_A + 2 - y_A + y_A + 2 = 9}$$

$$\overline{x_A = -9}$$

$$\overline{y_A = 5}$$

$$\overline{x_B = 11}$$

$$\overline{y_B = -3}$$

$$\overline{x_C = -5}$$

$$\overline{y_C = 7}$$

$$A(-9, 5), B(11, -3), C(-5, 7)$$

$$P_{\triangle ABC} = \frac{1}{2}[-9(-3 - 7) + 11(7 - 5) + (-5)(5 + 3)]$$

$$= \frac{1}{2}[90 + 22 - 40] = \frac{1}{2} \cdot 72 = 36$$