

Zadatak 13. Točka $C(1, 7)$ vrh je trokuta ABC , točka $A_1(3, 3)$ polovište je stranice \overline{BC} , a $T(1, 1)$ težište je trokuta. Izračunaj površinu tog trokuta.

Rješenje.

$$\begin{array}{l} C(1, 7) \\ A_1(3, 3) \\ T(1, 1) \end{array}$$

$$\begin{array}{l} \overline{x_{A_1} = \frac{x_B + x_C}{2} \cdot 3} \\ x_B + x_C = 6 \\ x_B + 1 = 6 \implies x_B = 5 \\ B(5, -1) \end{array}$$

$$\begin{array}{l} y_{A_1} = \frac{y_B + y_C}{2} = 3 \cdot 2 \\ y_B + y_C = 6 \\ y_B + 7 = 6 \implies y_B = -1 \end{array}$$

$$\overline{x_T = \frac{x_A + x_B + x_C}{3} = 1 \cdot 3} \quad \overline{y_T = \frac{y_A + y_B + y_C}{3} = 1 \cdot 3}$$

$$\begin{array}{l} x_A + 5 + 1 = 3 \implies x_A = -3 \\ A(-3, -3) \end{array} \quad \begin{array}{l} y_A + (-1) + 7 = 3 \implies y_A = -3 \end{array}$$

$$\begin{aligned} P_{\triangle ABC} &= \frac{1}{2} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)] \\ &= \frac{1}{2} [-3(-1 - 7) + 5(7 + 3) + 1(-3 + 1)] \\ &= \frac{1}{2} [24 + 50 - 2] \\ &= \frac{1}{2} \cdot 72 = 36 \end{aligned}$$