

Zadatak 15. Točke $P(1, -1)$, $Q(2, 3)$ i $R(-1, 1)$ polovišta su stranica trokuta. Kako glase jednačbe pravaca na kojima leže stranice?

Rješenje.

$$P(1, -1), \quad Q(2, 3), \quad R(-1, 1)$$

$$P \text{ polovište od } \overline{AB} \implies x_P = \frac{x_A + x_B}{2}, \quad y_P = \frac{y_A + y_B}{2}$$

$$Q \text{ polovište od } \overline{BC} \implies x_Q = \frac{x_B + x_C}{2}, \quad y_Q = \frac{y_B + y_C}{2}$$

$$R \text{ polovište od } \overline{CA} \implies x_R = \frac{x_C + x_A}{2}, \quad y_R = \frac{y_C + y_A}{2}$$

$$1 = \frac{x_A + x_B}{2} \quad / \cdot 2$$

$$2 = \frac{x_B + x_C}{2} \quad / \cdot 2$$

$$-1 = \frac{x_A + x_C}{2} \quad / \cdot 2$$

$$\left. \begin{array}{l} 2 = x_A + x_B \\ 4 = x_B + x_C \end{array} \right\} -$$

$$\underline{-2 = x_A + x_C}$$

$$\left. \begin{array}{l} -2 = x_A - x_C \\ -2 = x_A + x_C \end{array} \right\} +$$

$$\underline{-4 = 2x_A}$$

$$\underline{x_A = -2}$$

$$-2 = -2 - x_C$$

$$\underline{x_C = 0}$$

$$2 = -2 + x_B$$

$$\underline{x_B = 4}$$

$$-1 = \frac{y_A + y_B}{2} \quad / \cdot 2$$

$$3 = \frac{y_B + y_C}{2} \quad / \cdot 2$$

$$1 = \frac{y_A + y_C}{2} \quad / \cdot 2$$

$$\left. \begin{array}{l} -2 = y_A + y_B \\ 6 = y_B + y_C \end{array} \right\} -$$

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

$$\left. \begin{array}{l} -8 = y_A - y_C \\ 2 = y_A + y_C \end{array} \right\} +$$

$$\underline{-6 = 2y_A}$$

$$\underline{y_A = -3} \implies \underline{A(-2, -3)}$$

$$2 = -3 + y_C$$

$$\underline{y_C = 5} \implies \underline{C(0, 5)}$$

$$6 = y_B + 5$$

$$\underline{y_B = 1} \implies \underline{B(4, 1)}$$

a ... određen točkama B, C

$$y - 5 = \frac{1 - 5}{4 - 0}(x - 0)$$

$$y - 5 = -x$$

$$\underline{x + y - 5 = 0}$$

b ... određen točkama A, C

$$y + 3 = \frac{5 + 3}{0 + 2}(x + 2)$$

$$y + 3 = 4(x + 2)$$

$$y + 3 = 4x + 8$$

$$\underline{4x - y + 5 = 0}$$

c ... određen točkama *A*, *B*

$$y + 3 = \frac{1 + 3}{4 + 2}(x + 2)$$

$$y + 3 = \frac{2}{3}(x + 2) \quad / \cdot 3$$

$$3y + 9 = 2x + 4$$

$$2x - 3y - 5 = 0$$