

Zadatak 18. Dvije stranice paralelograma leže na pravcima $3x - 2y + 9 = 0$ i $x + y + 3 = 0$. Sjecište dijagonala je točka $S(1, 1)$. Odredi vrhove ovog paralelograma.

Rješenje.

$$S(1, 1)$$

$$p \dots 3x - 2y + 9 = 0 \implies y = \frac{3}{2}x - 9$$

$$q \dots x + y + 3 = 0 \implies y = -x - 3$$

$$\{A\} = p \cap q \dots \frac{3}{2}x + \frac{9}{2} = -x - 3 \quad / \cdot 2$$

$$3x + 9 = -2x - 6$$

$$9x = -15$$

$$x = -3$$

$$y = -(-3) - 3$$

$$y = 0 \implies A(-3, 0)$$

S je polovište od \overline{AC} (dijagonala paralelograma)

$$x_S = \frac{x_A + x_C}{2}$$

$$y_S = \frac{y_A + y_C}{2}$$

$$1 = \frac{-3 + x_C}{2} \quad / \cdot 2$$

$$1 = \frac{0 + y_C}{2} \quad / \cdot 2$$

$$2 = -3 + x_C$$

$$2 = y_C$$

$$x_C = 5$$

$$y_C = 2 \implies C(5, 2)$$

$$r \parallel q, C \in ry - 2 = -1(x - 5)$$

$$y - 2 = -1(x - 5)$$

$$y - 2 = -x + 5$$

$$x + y - 7 = 0$$

$$\{D\} = r \cap p \dots -x + 7 = \frac{3}{2}x + \frac{9}{2} \quad / \cdot 2$$

$$-2x + 14 = 3x + 9$$

$$-5x = -5$$

$$x = 1$$

$$y = -1 + 7$$

$$y = 6 \implies D(1, 6)$$

$$s \parallel p, C \in sy - 2 = \frac{3}{2}(x - 5) \quad / \cdot 2$$

$$2y - 4 = 3x - 15$$

$$3x - 2y - 11 = 0$$

$$\{B\} = q \cap s \dots \frac{3}{2}x - \frac{11}{2} = -x - 3 \quad / \cdot 2$$

$$3x - 11 = -2x - 6$$

$$5x = 5$$

$$x = 1$$

$$y = -1 - 3$$

$$y = -4 \implies B(1, -4)$$