

Zadatak 14. Dva paralelna pravca, $2x - 5y + 6 = 0$ i $2x - 5y - 7 = 0$ dijele ravninu na tri područja: prugu između njih te na dvije poluravnine. Kojem od tih triju područja pripadaju točke: $A(2, 1)$, $B(3, 0)$, $C(-2, 2)$, $D(10, 3)$, $E(-5, -3)$?

Rješenje.

$$p \dots 2x - 5y + 6 = 0$$

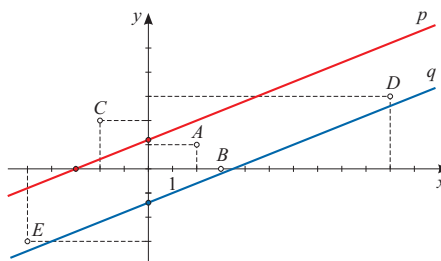
$$q \dots 2x - 5y - 7 = 0$$

$$p \dots y = \frac{2}{5}x + \frac{6}{5}$$

$$\begin{array}{c|c} x & y \\ \hline 0 & \frac{6}{5} \\ -3 & 0 \end{array}$$

$$q \dots y = \frac{2}{5}x - \frac{7}{5}$$

$$\begin{array}{c|c} x & y \\ \hline 0 & -\frac{7}{5} \\ \frac{7}{2} & 0 \end{array}$$



Za ordinatu točaka koje pripadaju donjoj poluravnini vrijedi $y < \frac{2}{5}x - \frac{7}{5}$.

Za ordinatu točaka koje pripadaju pruzi vrijedi $\frac{2}{5}x - \frac{7}{5} < y < \frac{2}{5}x + \frac{6}{5}$.

Za ordinatu točaka koje pripadaju gornjoj poluravnini vrijedi $y > \frac{2}{5}x + \frac{6}{5}$.

$$A(2, 1) \dots 1 = \frac{2}{5} \cdot 2 + \frac{1}{4}, \quad -\frac{7}{5} < \frac{1}{4} < \frac{6}{5} \implies A \text{ pruga}$$

$$B(3, 0) \dots 0 = \frac{2}{5} \cdot 3 - \frac{6}{5}, \quad -\frac{7}{5} < -\frac{6}{5} < \frac{6}{5} \implies B \text{ pruga}$$

$$C(-2, 2) \dots 2 = \frac{2}{5} \cdot (-2) + \frac{14}{5}, \quad \frac{14}{5} > \frac{6}{5} \implies C \text{ gornja poluravnina}$$

$$D(10, 3) \dots 3 = \frac{2}{5} \cdot 10 - \frac{5}{5}, \quad -\frac{7}{5} < -\frac{5}{5} < \frac{6}{5} \implies D \text{ pruga}$$

$$E(-5, -3) \dots -3 = \frac{2}{5} \cdot (-5) - \frac{5}{5}, \quad -\frac{7}{5} < -\frac{5}{5} < \frac{6}{5} \implies E \text{ pruga}$$