

Zadatak 31. Na pravcu $x - 2y - 2 = 0$ odredi točku za koju je zbroj udaljenosti od točaka $M(-4, 2)$ i $N(3, 3)$ najmanji.

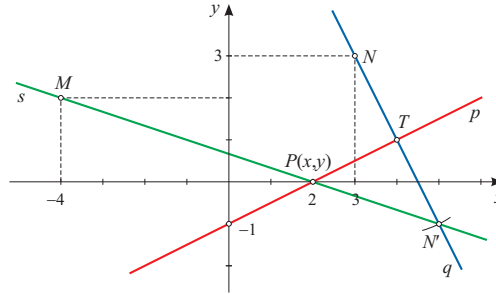
Rješenje.

$$p \dots x - 2y - 2 = 0, \quad -2y - x + 2, \quad y = \frac{1}{2}x - 1 \quad \begin{array}{c|c} x & y \\ \hline 0 & -1 \\ 2 & 0 \end{array}$$

$$M(-4, 2), \quad N(3, 3), \quad P = ?$$

$$|MP| + |NP| \rightarrow \min$$

$$P\left(x, \frac{1}{2}x - 1\right) \in p$$



$$q \perp p \implies k_q = -\frac{1}{k_p} = -2$$

$$q \dots y - 3 = -2(x - 3)$$

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

$$y = -2x + 9$$

T polovište od \overline{MN}

$$\{T\} = p \cap q \implies -2x + 9 = \frac{1}{2}x - 1 \quad / \cdot 2$$

$$-4x + 18 = x - 2$$

$$-5x = -20$$

$$x = 4$$

$$y = -8 + 9$$

$$y = 1,$$

$$T(4, 1)$$

$$x_T = \frac{x_N + x_{N'}}{2} \implies \frac{3 + x_{N'}}{2} = 4 \quad / \cdot 2$$

$$x_T = \frac{y_N + y_{N'}}{2} \implies \frac{3 + y_{N'}}{2} = 1 \quad / \cdot 2$$

$$3 + x_{N'} = 8$$

$$\underline{3 + y_{N'} = 2}$$

$$x_{N'} = 5$$

$$y_{N'} = -1,$$

$$N'(5, -1)$$

$$s \dots y - y_1 = \frac{y_2 - y_1}{x_2 - x_1}(x - x_1)$$

$$y - 2 = \frac{-1 - 2}{5 + 4}(x + 4)$$

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

$$y - 2 = -\frac{1}{3}x - \frac{4}{3}$$

$$y = -\frac{1}{3}x + \frac{2}{3}$$

$$\{P\} = s \cap p \implies -\frac{1}{3}x + \frac{2}{3} = \frac{1}{2}x - 1 \quad / \cdot 6$$

$$-2x + 4 = 3x - 6$$

$$x = 2$$

$$y = \frac{1}{2} \cdot 2 - 1$$

$$y = 0,$$

$$P(2, 0)$$