

Zadatak 35. Ortocentar trokuta kojem su dvije stranice na pravcima $x + 3y - 1 = 0$ i $3x + 5y - 6 = 0$ ishodište je koordinatnog sustava. Odredi jednadžbu pravca kojem pripada treća stranica trokuta.

Rješenje.

$$a \dots x + 3y - 1 = 0 \implies y = -\frac{1}{3}x + \frac{1}{3}$$

$$b \dots 3x + 5y - 6 = 0 \implies y = -\frac{3}{5}x + \frac{6}{5}$$

$$\underline{H(0,0)}$$

$$c = ? \dots y - y_A = k_a(x - x_A)$$

$$\{C\} = a \cap b \dots -\frac{1}{3}x + \frac{1}{3} = -\frac{3}{5}x + \frac{6}{5} \quad / \cdot 15$$

$$-5x + 5 = -9x + 18$$

$$4x = 13$$

$$x = \frac{13}{4}$$

$$y = -\frac{1}{3} \cdot \frac{13}{4} + \frac{1}{3} = \frac{-13 + 4}{12} = -\frac{9}{12}$$

$$y = -\frac{3}{4} \implies C\left(\frac{13}{4}, -\frac{3}{4}\right)$$

$$k_{v_c} = \frac{y_C - y_H}{x_C - x_H} = \frac{-\frac{3}{4} - 0}{\frac{13}{4} - 0} = -\frac{3}{13} \implies k_c = \frac{13}{3}$$

$$v_c \dots \{H\} \in v_c \implies$$

$$y - 0 = -\frac{3}{13}(x - 0)$$

$$y = -\frac{3}{13}x$$

$$v_a \dots k_{v_a} = -\frac{1}{k_a} = -\frac{1}{-\frac{1}{3}} = 3, \{H\} \in v_a \implies$$

$$y - 0 = 3(x - 0)$$

$$y = 3x$$

$$A = v_a \cap b \dots 3x = -\frac{3}{5}x + \frac{6}{5} \quad / \cdot 5$$

$$15x = -3x + 6$$

$$18x = 6$$

$$x = \frac{1}{3}$$

$$y = 3 \cdot \frac{1}{3}$$

$$y = 1 \implies A\left(\frac{1}{3}, 1\right)$$

c ... $A \in c, k_c$

$$y - 1 = \frac{13}{3} \left(x - \frac{1}{3} \right)$$

$$y = \frac{13}{3}x - \frac{13}{9} + 1 \quad / \cdot 9$$

$$39x - 9y - 4 = 0$$