

**Zadatak 35.** Odredi nepoznatu koordinatu vrha  $C(4, y)$  trokuta  $ABC$ ,  $A(-2, 0)$ ,  $B(5, 1)$ , tako da trokut bude pravokutan.

**Rješenje.**

Neka je pravi kut trokuta pri vrhu  $C$ .

$$\vec{CA} = (-2 - 4)\vec{i} + (0 - y)\vec{j} = -6\vec{i} - y\vec{j}$$

$$\vec{CB} = (5 - 4)\vec{i} + (1 - y)\vec{j} = \vec{i} + (1 - y)\vec{j}$$

$$\vec{CA} \cdot \vec{CB} = 0$$

$$-6 \cdot 1 - y \cdot (1 - y) = 0$$

$$y_{1,2} = \frac{1 \pm \sqrt{1 + 24}}{2} = \frac{1 \pm 5}{2}$$

$$y_1 = 3 \implies C_1(4, 3)$$

$$y_2 = -2 \implies C_2(4, -2)$$

Neka je pravi kut trokuta pri vrhu  $A$ .

$$\vec{AB} = (5 + 2)\vec{i} + (1 - 0)\vec{j} = 7\vec{i} + \vec{j}$$

$$\vec{AC} = (4 + 2)\vec{i} + (y - 0)\vec{j} = 6\vec{i} + y\vec{j}$$

$$\vec{AB} \cdot \vec{AC} = 0$$

$$7 \cdot 6 + y = 0$$

$$y = -42 \implies C(4, -42)$$

Neka je pravi kut trokuta pri vrhu  $B$ .

$$\vec{BA} = -\vec{AB} = -7\vec{i} - \vec{j}$$

$$\vec{BC} = -\vec{CB} = -\vec{i} - (1 - y)\vec{j}$$

$$\vec{BA} \cdot \vec{BC} = 0$$

$$-7 \cdot (-1) + (1 - y) = 0$$

$$y = 8 \implies C(4, 8)$$