

Zadatak 10. Vrhovi trokuta ABC su točke $A(-3, -1)$, $B(7, -6)$, $C(5, 5)$. Kolike su duljine visina tog trokuta?

Rješenje.

$$A(-3, -1)$$

$$B(7, -6)$$

$$C(5, 5)$$

$$v_a = ?, \quad v_b = ?, \quad v_c = ?$$

$$a = BC \quad \dots \quad y + 6 = \frac{5+6}{5-7}(x-7)$$

$$y + 6 = -\frac{11}{2}(x-7) \quad / \cdot 2$$

$$2y + 12 = -11x + 77$$

$$11x + 2y - 65 = 0$$

$$b = AC \quad \dots \quad y + 1 = \frac{5+1}{5+3}(x+3)$$

$$y + 1 = \frac{6}{8}(x+3)$$

$$y + 1 = \frac{3}{4}(x+3) \quad / \cdot 4$$

$$4y + 4 = 3x + 9$$

$$3x - 4y + 5 = 0$$

$$c = AB \quad \dots \quad y + 1 = \frac{-6+1}{7+3}(x+3)$$

$$y + 1 = -\frac{1}{2}(x+3) \quad / \cdot 2$$

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

$$x + 2y + 5 = 0$$

$$v_a = d(A, a) = \frac{|11 \cdot (-3) + 2 \cdot (-1) - 65|}{\sqrt{121 + 4}} = \frac{100}{\sqrt{125}} = \frac{100}{5\sqrt{5}} = \frac{20}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{20\sqrt{5}}{5} = 4\sqrt{5}$$

$$v_b = d(B, b) = \frac{|3 \cdot 7 + (-4) \cdot (-6) + 5|}{\sqrt{9 + 16}} = \frac{50}{5} = 10$$

$$v_c = d(C, c) = \frac{|1 \cdot 5 + 2 \cdot 5 + 5|}{\sqrt{1 + 4}} = \frac{20}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{20\sqrt{5}}{5} = 4\sqrt{5}$$