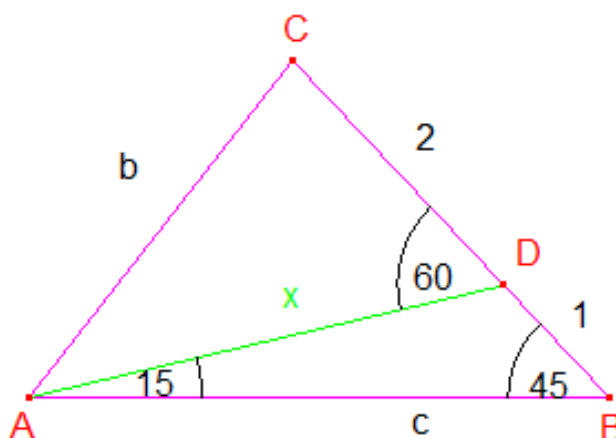


PROBLEMA 878

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En el triángulo ABC, como indica la figura, el punto D divide el lado BC en dos partes de longitudes BD = 1, DC = 2, y se conocen los ángulos $\angle ABC = 45^\circ$, $\angle ADC = 60^\circ$



Determina la medida del ángulo $\angle ACB$

$$x = \frac{\text{sen } 45}{\text{sen } 15} = \frac{2\sqrt{2}}{\sqrt{6} - \sqrt{2}} \quad c = \frac{\text{sen } 120}{\text{sen } 15} = \frac{\text{sen } 60}{\text{sen } 15} = \frac{2\sqrt{3}}{\sqrt{6} - \sqrt{2}}$$

$$b^2 = c^2 + 9 - 6c \cos 45 = \frac{3}{2 - \sqrt{3}} + 9 - \frac{6\sqrt{6}}{\sqrt{6} - \sqrt{2}} = 9 + \frac{15\sqrt{2} - 9\sqrt{6}}{3\sqrt{6} - 5\sqrt{2}}$$

$$b^2 = \frac{27\sqrt{6} - 45\sqrt{2} + 15\sqrt{2} - 9\sqrt{6}}{3\sqrt{6} - 5\sqrt{2}} = \frac{18\sqrt{6} - 30\sqrt{2}}{3\sqrt{6} - 5\sqrt{2}} = 6$$

$$b = \sqrt{6}$$

$$\frac{\text{sen } \alpha}{c} = \frac{\text{sen } 45}{\sqrt{6}} \quad \text{sen } \alpha = \frac{2\sqrt{3}}{\sqrt{6} - \sqrt{2}} \frac{\sqrt{2}}{2\sqrt{6}} = \frac{2\sqrt{6}}{(\sqrt{6} - \sqrt{2})2\sqrt{6}} = \frac{1}{\sqrt{6} - \sqrt{2}}$$

$$\alpha = 75^\circ$$