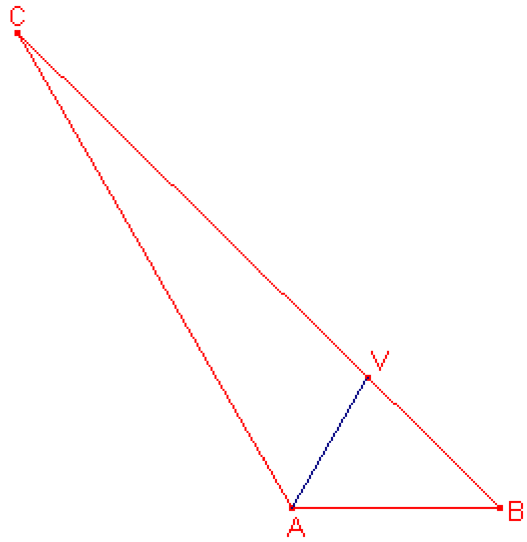
Problema 837

Resoleu el triangle $\overset{\Delta}{ABC}$ coneguts $A = 120^o$, $v_a = 2$ bisectriu interior de l'angle A i $b + c = 10$.

Solució de Ricard Peiro:

Suposem que $b \geq c$.



$$v_a = \frac{2bc}{b+c}\cos\frac{A}{2}.$$

$$2 = \frac{2b(10-b)}{10}\frac{1}{2}.$$

$$b^2 - 10b + 20 = 0.$$

Resolent l'equació:

$$b = 5 + \sqrt{5}.$$

$$c = 5 - \sqrt{5}.$$

Aplicant el teorema del cosinus al triangle $\overset{\Delta}{ABC}$:

$$a^2 = \left(5+\sqrt{5}\right)^2 + \left(5-\sqrt{5}\right)^2 - 2\left(5+\sqrt{5}\right)\left(5-\sqrt{5}\right)\cos 120^o.$$

$$a^2 = 80.$$

$a = 4\sqrt{5}$ a.