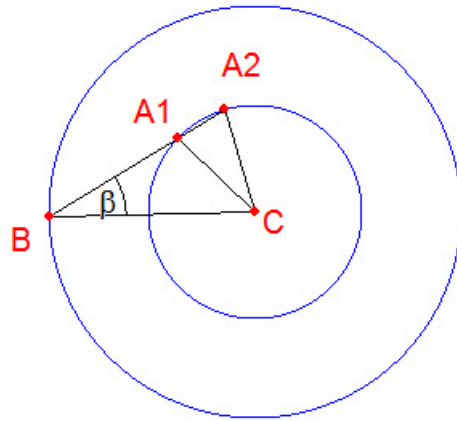


3) Données

- * triangle $\triangle ABC$
- * $a = BC = 1 + \sqrt{3}$
- * $b = AC = \sqrt{2}$
- * $\beta = 30^\circ$
- * Construire ce triangle et calculer c , α , γ .



Résolution:

Thm du sinus:

$$\frac{b}{\sin(\beta)} = \frac{a}{\sin(\alpha)} \Leftrightarrow \sin(\alpha) = \frac{a}{b} \sin(\beta) \quad \text{a.m.: } \sin(\alpha) = \frac{1+\sqrt{3}}{\sqrt{2}} \cdot \frac{1}{2} = \frac{\sqrt{2}+\sqrt{6}}{4}$$

$$\Rightarrow \alpha_1 = 75^\circ \text{ ou } \alpha_2 = 105^\circ$$

$$\text{d'où } \gamma_1 = 180^\circ - \alpha_1 - \beta = 75^\circ \quad (\text{et } \triangle ABC \text{ isocèle})$$

$$\gamma_2 = 180^\circ - \alpha_2 - \beta = 45^\circ$$

$$\text{puis: } \frac{c}{\sin(\gamma)} = \frac{b}{\sin(\beta)} \Leftrightarrow c = b \cdot \frac{\sin(\gamma)}{\sin(\beta)}$$

$$\begin{aligned} \text{-a.m.: } c_1 &= b \cdot \frac{\sin(\gamma_1)}{\sin(\beta)} = \sqrt{2} \cdot \frac{\sin(75^\circ)}{\sin(30^\circ)} = \sqrt{2} \cdot \frac{\frac{\sqrt{2}+\sqrt{6}}{4}}{\frac{1}{2}} = \frac{2+2\sqrt{3}}{2} \\ c_2 &= b \cdot \frac{\sin(\gamma_2)}{\sin(\beta)} = \sqrt{2} \cdot \frac{\sin(45^\circ)}{\sin(30^\circ)} = \sqrt{2} \cdot \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}} = 2 \end{aligned} \quad \left| \begin{array}{l} = 1+\sqrt{3} = a \\ \end{array} \right.$$