

13.7 Commençons par résoudre ce triangle :

$$c^2 = a^2 + b^2 - 2ab \cos(\gamma) = 28,4^2 + 36,9^2 - 2 \cdot 28,4 \cdot 36,9 \cdot \cos(54,9^\circ) \approx 963,00$$

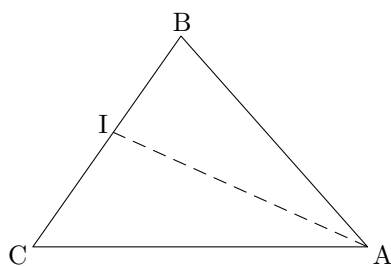
$$c \approx \sqrt{963,00} = 31,03$$

$$\cos(\alpha) = \frac{a^2 - b^2 - c^2}{-2bc} \approx \frac{28,4^2 - 36,9^2 - 31,03^2}{-2 \cdot 36,9 \cdot 31,03} = 0,662\,852$$

$$\alpha \approx \arccos(0,662\,852) = 48,48^\circ$$

$$\beta = 180^\circ - (\alpha + \gamma) \approx 180^\circ - (48,48^\circ + 54,9^\circ) = 76,62^\circ$$

Calcul de la bissectrice b_a

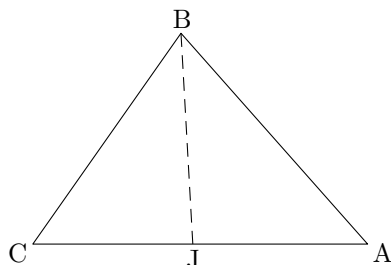


$$\widehat{AIB} = 180^\circ - \left(\frac{1}{2}\alpha + \beta\right) \approx 180^\circ - \left(\frac{1}{2} \cdot 48,48^\circ + 76,62^\circ\right) = 79,14^\circ$$

En considérant le triangle ABI, on pose $\frac{b_a}{\sin(\beta)} = \frac{c}{\sin(\widehat{AIB})}$, d'où l'on tire

$$b_a = \frac{c \sin(\beta)}{\sin(\widehat{AIB})} \approx \frac{31,03 \cdot \sin(76,62^\circ)}{\sin(79,14^\circ)} = 30,74$$

Calcul de la bissectrice b_b

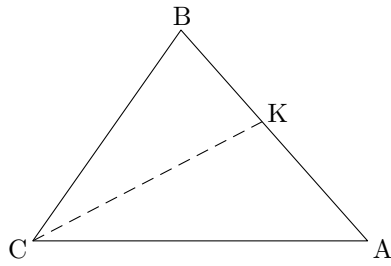


$$\widehat{AJB} = 180^\circ - \left(\alpha + \frac{1}{2}\beta\right) \approx 180^\circ - \left(48,48^\circ + \frac{1}{2} \cdot 76,62^\circ\right) = 93,21^\circ$$

En appliquant le théorème du sinus au triangle ABJ, on obtient :

$$b_b = \frac{c \sin(\alpha)}{\sin(\widehat{AJB})} \approx \frac{31,03 \cdot \sin(48,48^\circ)}{\sin(93,21^\circ)} = 23,27$$

Calcul de la bissectrice b_c



$$\widehat{CKA} = 180^\circ - (\alpha + \frac{1}{2} \gamma) \approx 180^\circ - (48,48^\circ + \frac{1}{2} \cdot 54,9^\circ) = 104,07^\circ$$

On utilise le théorème du sinus pour le triangle AKC pour avoir :

$$b_c = \frac{b \sin(\alpha)}{\sin(\widehat{CKA})} \approx \frac{36,9 \cdot \sin(48,48^\circ)}{\sin(104,07^\circ)} = 28,48$$