

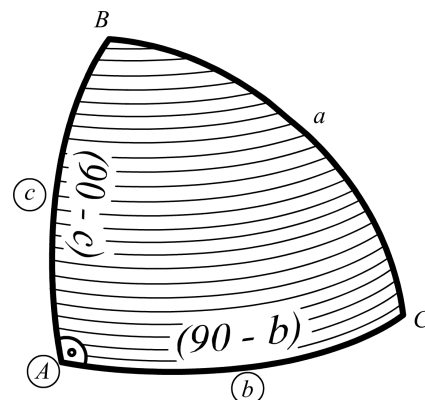
Прямоугольные Сферические Треугольники

Исходные данные:

$$\begin{aligned} A &= 90^{\circ}00.0' = 90^{\circ}; \\ b &= 45^{\circ}32.4' = 45.5^{\circ}; \\ c &= 53^{\circ}03.2' = 53.1^{\circ}. \end{aligned}$$

Найти элементы:

$$\begin{aligned} B &= ?; \\ C &= ?; \\ a &= ?. \end{aligned}$$



1. Найдём сторону "a" по формуле:

$$\cos a = \sin(90 - b) \cdot \sin(90 - c)$$

$$\cos a = \cos b \cdot \cos c = \cos(45.5^{\circ}) \cdot \cos(53.1^{\circ}) = 0.70041 \cdot 0.60107 = 0.421;$$

$$a = \arccos(0.421) = \underline{65^{\circ}06.1'}$$

2. Найдём угол "B" по формуле:

$$\cos B = \operatorname{ctg} a \cdot \operatorname{ctg}(90 - c)$$

$$\cos B = \operatorname{ctg} a \cdot \operatorname{tg} c = \operatorname{ctg}(65.1^{\circ}) \cdot \operatorname{tg}(53.1^{\circ}) = 0.46413 \cdot 1.32962 = 0.61712;$$

$$B = \arccos(0.61712) = \underline{51^{\circ}53.6'}$$

3. Найдём угол "C" по формуле:

$$\cos C = \operatorname{ctg} a \cdot \operatorname{ctg}(90 - b)$$

$$\cos C = \operatorname{ctg} a \cdot \operatorname{tg} b = \operatorname{ctg}(65.1^{\circ}) \cdot \operatorname{tg}(45.5^{\circ}) = 0.46413 \cdot 1.01903 = 0.47296;$$

$$C = \arccos(0.47296) = \underline{61^{\circ}46.3'}$$

4. Проверка полученных результатов по формуле синусов:

$$\frac{\sin A}{\sin B} = \frac{\sin a}{\sin b} \quad \frac{\sin(90^{\circ})}{\sin(51.9^{\circ})} = \frac{\sin(65.1^{\circ})}{\sin(45.5^{\circ})} \quad 1.270858 = 1.270858;$$

$$\frac{\sin A}{\sin C} = \frac{\sin a}{\sin c} \quad \frac{\sin(90^{\circ})}{\sin(61.8^{\circ})} = \frac{\sin(65.1^{\circ})}{\sin(53.1^{\circ})} \quad 1.134969 = 1.134969;$$

$$\frac{\sin B}{\sin C} = \frac{\sin b}{\sin c} \quad \frac{\sin(51.9^{\circ})}{\sin(61.8^{\circ})} = \frac{\sin(45.5^{\circ})}{\sin(53.1^{\circ})} \quad 0.893073 = 0.893073.$$