

1°. Kiindulunk a $\sin(\alpha + \beta + \gamma) = 0$ egyenletből.

$$\sin \alpha \cos(\beta + \gamma) + \cos \alpha \sin(\beta + \gamma) = 0,$$

$$\sin \alpha \cos \beta \cos \gamma - \sin \alpha \sin \beta \sin \gamma + \cos \alpha \sin \beta \cos \gamma + \cos \alpha \cos \beta \sin \gamma = 0,$$

vagyis

$$\sin \alpha \cos \beta \cos \gamma + \sin \beta \cos \alpha \cos \gamma + \sin \gamma \cos \alpha \cos \beta = \sin \alpha \sin \beta \sin \gamma.$$

$$\begin{aligned} 2^\circ. \quad \frac{\operatorname{ctg} \frac{\beta}{2} + \operatorname{ctg} \frac{\gamma}{2}}{\operatorname{ctg} \frac{\alpha}{2} + \operatorname{ctg} \frac{\gamma}{2}} &= \frac{\frac{\sin \frac{\beta+\gamma}{2}}{\sin \frac{\beta}{2} \sin \frac{\gamma}{2}}}{\frac{\sin \frac{\alpha+\gamma}{2}}{\sin \frac{\alpha}{2} \sin \frac{\gamma}{2}}} = \frac{\frac{\cos \frac{\alpha}{2}}{\sin \frac{\beta}{2}}}{\frac{\cos \frac{\beta}{2}}{\sin \frac{\alpha}{2}}} = \\ &= \frac{\cos \frac{\alpha}{2} \sin \frac{\alpha}{2}}{\cos \frac{\beta}{2} \sin \frac{\beta}{2}} = \frac{2 \sin \frac{\alpha}{2} \cos \frac{\alpha}{2}}{2 \sin \frac{\beta}{2} \cos \frac{\beta}{2}} = \frac{\sin \alpha}{\sin \beta}. \end{aligned}$$

(Strasser István, Budapest.)

Megoldások száma: 57.