

Formeln für die Kugelgeometrie

Sphärische Dreiecke und Vielecke

$$f_{\Delta ABC} = r^2(\alpha + \beta + \gamma - \pi)$$

$$f_{n\text{-Eck}} = r^2 \left(\sum_{i=1}^n \varphi_i - (n-2)\pi \right)$$

Sphärische Trigonometrie

Seiten-Cosinus-Satz

$$\cos(c) = \cos(a)\cos(b) + \sin(a)\sin(b)\cos(\gamma)$$

$$\cos(a) = \cos(b)\cos(c) + \sin(b)\sin(c)\cos(\alpha)$$

$$\cos(b) = \cos(c)\cos(a) + \sin(c)\sin(a)\cos(\beta)$$

Winkel-Cosinus-Satz

$$\cos(\gamma) = -\cos(\alpha)\cos(\beta) + \sin(\alpha)\sin(\beta)\cos(c)$$

$$\cos(\alpha) = -\cos(\beta)\cos(\gamma) + \sin(\beta)\sin(\gamma)\cos(a)$$

$$\cos(\beta) = -\cos(\gamma)\cos(\alpha) + \sin(\gamma)\sin(\alpha)\cos(b)$$

Sinus-Satz

$$\frac{\sin(a)}{\sin(\alpha)} = \frac{\sin(b)}{\sin(\beta)} = \frac{\sin(c)}{\sin(\gamma)}$$

Tangens-Satz, erste Gruppe

$$\frac{\sin(c)}{\tan(b)} = \cos(c)\cos(\alpha) + \frac{\sin(\alpha)}{\tan(\beta)}$$

$$\frac{\sin(a)}{\tan(c)} = \cos(a)\cos(\beta) + \frac{\sin(\beta)}{\tan(\gamma)}$$

$$\frac{\sin(b)}{\tan(a)} = \cos(b)\cos(\gamma) + \frac{\sin(\gamma)}{\tan(\alpha)}$$

Tangens-Satz, zweite Gruppe

$$\frac{\sin(a)}{\tan(b)} = \cos(a)\cos(\gamma) + \frac{\sin(\gamma)}{\tan(\beta)}$$

$$\frac{\sin(b)}{\tan(c)} = \cos(b)\cos(\alpha) + \frac{\sin(\alpha)}{\tan(\gamma)}$$

$$\frac{\sin(c)}{\tan(a)} = \cos(c)\cos(\beta) + \frac{\sin(\beta)}{\tan(\alpha)}$$

Sphärischer Pythagoras

$$\cos(c) = \cos(a)\cos(b)$$