$$AI = \frac{b+c}{2s}\,AD = \frac{bc}{s}\cos\frac{\alpha}{2} = \frac{r}{\sin\frac{\alpha}{2}} = \sqrt{(s-a)^2+r^2} = \sqrt{bc-4Rr},$$

$$BI = \frac{c+a}{2s}\,BE = \frac{ca}{s}\cos\frac{\beta}{2} = \frac{r}{\sin\frac{\beta}{2}} = \sqrt{(s-b)^2+r^2} = \sqrt{ca-4Rr},$$

$$CI = \frac{a+b}{2s}\,CF = \frac{ab}{s}\cos\frac{\gamma}{2} = \frac{r}{\sin\frac{\gamma}{2}} = \sqrt{(s-c)^2+r^2} = \sqrt{ab-4Rr},$$

$$AI\cdot BI\cdot CI = 4Rr^2,$$

$$DI = \frac{a}{2s}\,AD, \qquad EI = \frac{b}{2s}\,BE, \qquad FI = \frac{c}{2s}\,CF,$$

$$\frac{AI}{DI} = \frac{b+c}{a}, \qquad \frac{BI}{EI} = \frac{c+a}{b}, \qquad \frac{CI}{FI} = \frac{a+b}{c},$$

$$DE^2 = ab\left[\frac{ab}{(b+c)^2} + \frac{ab}{(c+a)^2} - \frac{a^2+b^2-c^2}{(b+c)(c+a)}\right],$$

$$EF^2 = bc\left[\frac{bc}{(c+a)^2} + \frac{bc}{(a+b)^2} - \frac{b^2+c^2-a^2}{(c+a)(a+b)}\right],$$

$$FD^2 = ca\left[\frac{ca}{(a+b)^2} + \frac{ca}{(b+c)^2} - \frac{c^2+a^2-b^2}{(a+b)(b+c)}\right],$$

$$\begin{aligned} DE^2+EF^2+FD^2 &= \frac{2\sigma_3}{(\sigma_1\sigma_2-\sigma_3)^2}\,(4\sigma_1^3\sigma_2-\sigma_1^5-6\sigma_1^2\sigma_3-\sigma_2\sigma_3),\\ &= 8Rr^2\cdot\frac{s^2(7R+8r)-Rr(4R+r)}{(s^2+2Rr+r^2)^2},\end{aligned}$$

$$\measuredangle SIT = 180^\circ-\alpha = \beta+\gamma, \qquad \measuredangle TIR = 180^\circ-\beta = \gamma+\alpha,$$

$$\measuredangle RIS = 180^\circ-\gamma = \alpha+\beta,$$

$$\measuredangle TRS = \frac{\beta+\gamma}{2} = 90^\circ-\frac{\alpha}{2}, \qquad \measuredangle RST = \frac{\gamma+\alpha}{2} = 90^\circ-\frac{\beta}{2},$$

$$\measuredangle STR = \frac{\alpha+\beta}{2} = 90^\circ-\frac{\gamma}{2},$$

$$\measuredangle DIR = \frac{\gamma-\beta}{2}, \qquad \measuredangle EIS = \frac{\alpha-\gamma}{2}, \qquad \measuredangle FIT = \frac{\beta-\alpha}{2},$$

$$ST = 2(s-a)\sin\frac{\alpha}{2}, \qquad TR = 2(s-b)\sin\frac{\beta}{2}, \qquad RS = 2(s-c)\sin\frac{\gamma}{2},$$

$$\tan\frac{\alpha}{2} = \frac{r}{s-a}, \qquad \tan\frac{\beta}{2} = \frac{r}{s-b}, \qquad \tan\frac{\gamma}{2} = \frac{r}{s-c},$$

$$[BIC] = \frac{ra}{2}, \qquad [CIA] = \frac{rb}{2}, \qquad [AIB] = \frac{rc}{2},$$

$$RI = SI = TI = r,$$

$$\Delta = rs,$$

$$[STI] = \frac{1}{2}r^2\sin\alpha, \qquad [TRI] = \frac{1}{2}r^2\sin\beta, \qquad [RSI] = \frac{1}{2}r^2\sin\gamma,$$

$$[RST] = \frac{r\Delta}{2R} = \frac{r^2 s}{2R}.$$

(Wird fortgesetzt.)