

$$\tan \alpha + \tan \beta + \tan \gamma = \tan \alpha \tan \beta \tan \gamma = \frac{2rs}{s^2 - (2R + r)^2},$$

$$\tan^2 \alpha + \tan^2 \beta + \tan^2 \gamma = \frac{4r^2s^2 - 2(s^2 - 4Rr - r^2)[s^2 - (2R + r)^2]}{[s^2 - (2R + r)^2]^2},$$

$$\tan \beta \tan \gamma + \tan \gamma \tan \alpha + \tan \alpha \tan \beta = \frac{s^2 - 4Rr - r^2}{s^2 - (2R + r)^2},$$

$$\tan^3 \alpha + \tan^3 \beta + \tan^3 \gamma = \frac{8rs[r^2s^2 - 3R^2[s^2 - (2R + r)^2]]}{[s^2 - (2R + r)^2]^3},$$