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

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

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

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