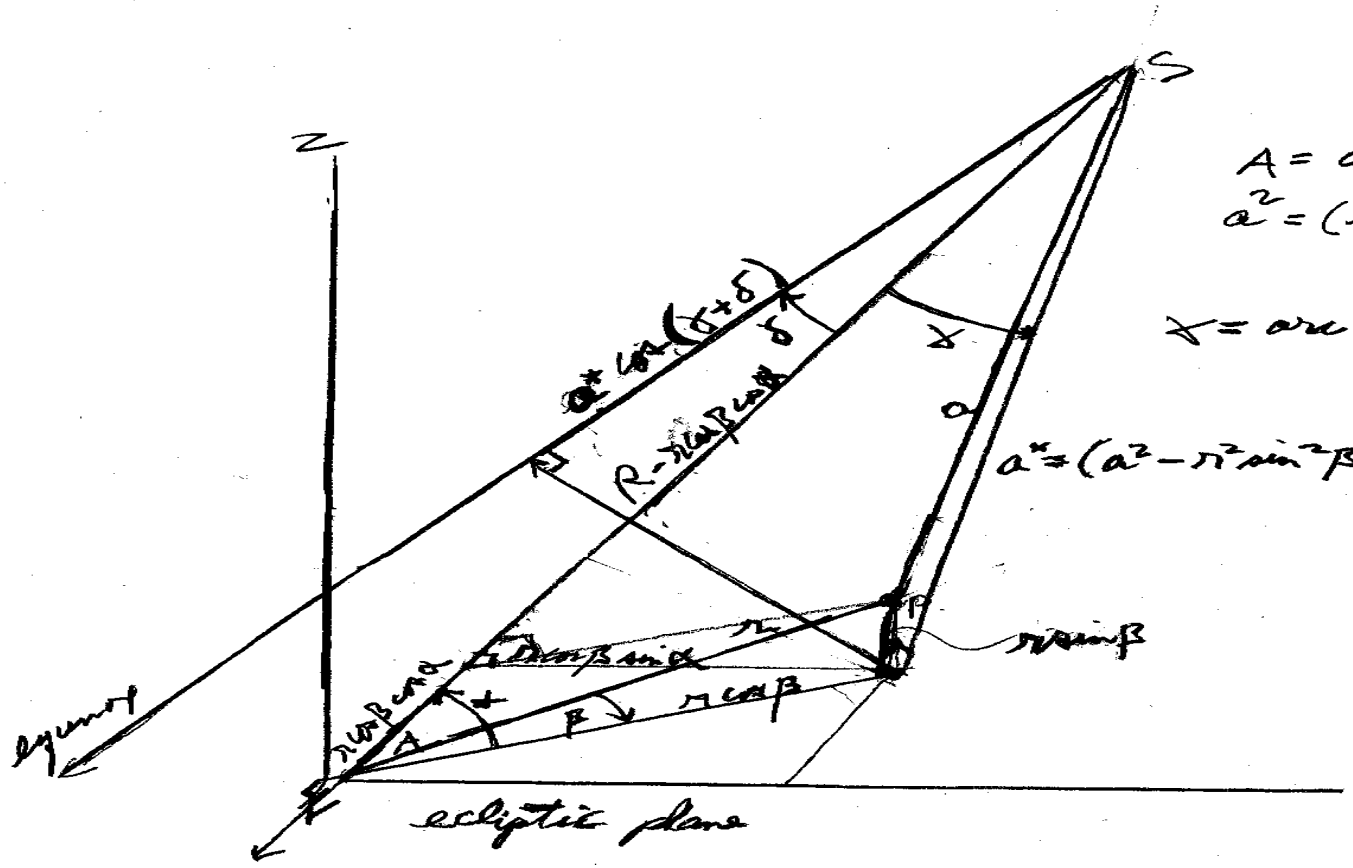

$$A = \arccos(\cos\alpha \cos\beta)$$

$$a^2 = (r^2 + R^2 - 2rR\cos A)$$

$$\gamma = \arccos \frac{(R - r\cos\beta\cos\alpha)}{(a^2 - r^2\sin^2\beta)^{1/2}}$$