

$$z^2 - z \frac{2b}{a} + b^2 - R_1^2 = 0$$

$$z^2 - z \frac{b}{a} + \frac{b^2 - R_1^2}{2} = 0$$

$$z_{1/2} = \frac{b}{2a} \pm \sqrt{\left(\frac{b}{2a}\right)^2 - \left(\frac{b^2 - R_1^2}{2}\right)}$$

$$\sin \beta = \frac{z}{R_1}$$

$$\beta = \arcsin\left(\frac{z}{R_1}\right)$$

$$x = \frac{z}{\cos \beta}$$

$$y = \frac{z}{\sin \beta}$$

$$\cos \beta = \frac{y}{R_1}$$

$$z^2 \left(1 + \frac{1}{a^2}\right) - 2z \frac{b}{a} + b^2 - R_1^2 = 0$$

$$z^2 - z \frac{2b}{a \left(1 + \frac{1}{a^2}\right)} + \frac{b^2 - R_1^2}{1 + \frac{1}{a^2}} = 0$$