$$\tan\alpha + ctan\,\alpha = \mathrm{a}$$

$$\frac{\sin\alpha}{\cos\alpha} + \frac{\cos\alpha}{\sin\alpha} = \mathrm{a}$$

$$\frac{\sin^2\alpha + \cos^2\alpha}{\sin\alpha\cos\alpha} = \mathrm{a}$$

$$\frac{1}{\sin\alpha\cos\alpha} = \mathrm{a}$$

$$\sin\alpha\cos\alpha = \frac{1}{\mathrm{a}}$$

$$\sin\alpha\sqrt{1-\sin^2\alpha} = \frac{1}{\mathrm{a}}$$

$$\sin^2\alpha\,(1-\sin^2\alpha) = \frac{1}{\mathrm{a}^2}$$

$$\sin^4\alpha - \sin^2\alpha + \frac{1}{\mathrm{a}^2} = 0$$

$$\sin^2\alpha = t$$

$$t^2 - t + \frac{1}{\mathrm{a}^2} = 0$$

$$D = 1 - \frac{4}{\mathrm{a}^2}$$

$$t_1 = \frac{-1+\sqrt{1-\frac{4}{\mathrm{a}^2}}}{2} \qquad t_2 = \frac{-1-\sqrt{1-\frac{4}{\mathrm{a}^2}}}{2} < 0$$

$$\sin\alpha = \pm\sqrt{\frac{-1+\sqrt{1-\frac{4}{\mathrm{a}^2}}}{2}}$$