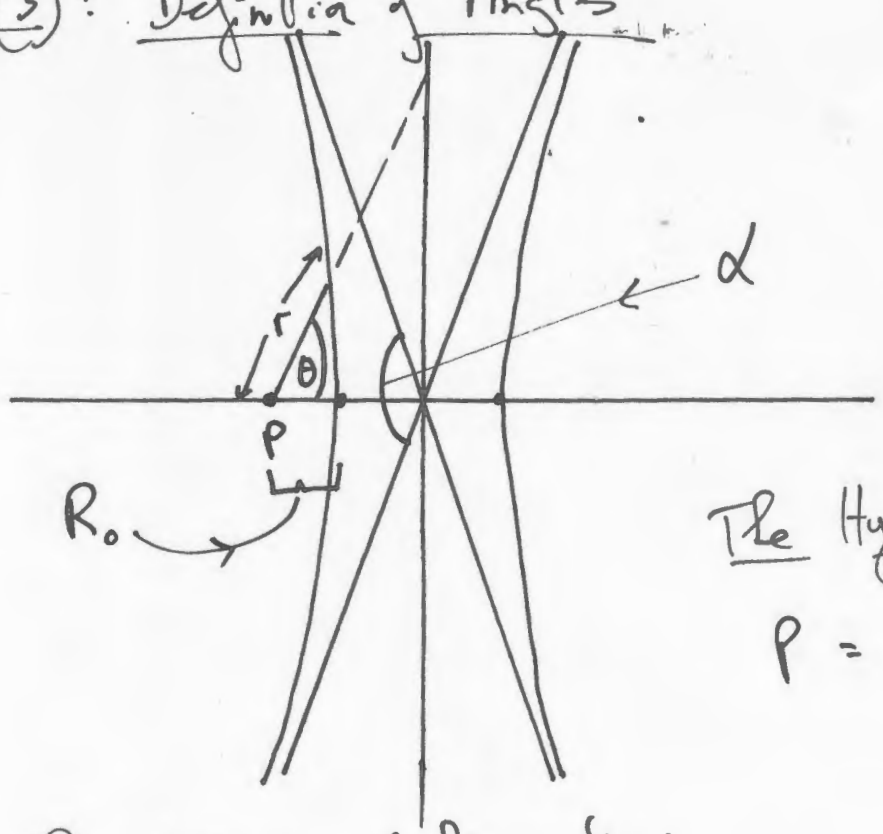
Note 216(3): Definition of Angles



The Hyperbola

P = focus

The hyperbola is defined by:

$$r = \frac{d}{1 + \epsilon \cos\theta} \quad -(1)$$

where $$\epsilon = \frac{1}{\sin\theta} \quad -(2)$$

The angle α is:

$$\alpha = \pi - 2\tan^{-1}\left(\epsilon^2 - 1\right)^{-1/2} \quad -(3)$$

The deflection of the hyperbola is:

$$\phi = 2\tan^{-1}\left(\epsilon^2 - 1\right)^{-1/2} \quad -(4)$$

$$= \frac{2MG}{R_0 c^2}$$

is Newtonian theory of light deflection

In the small angle limit.

2)

$$\theta = \phi = \frac{2MG}{R_0 c^2} \quad -(5)$$

In the Newtonian theory:

$$\epsilon = \frac{R_0 c^2}{MG} - 1 \quad -(6)$$

$$\sim \frac{R_0 c^2}{MG}$$

The observed value is

$$\theta = \phi = \frac{4MG}{R_0 c^2} \quad -(7)$$

if data can be accepted. The Einstein general relativity can no longer be used to explain eq. (7).

Therefore it is next note to seek an explanation in terms of:

$$r = \frac{\alpha}{1 + \epsilon \cos(x\theta)} \quad -(8)$$