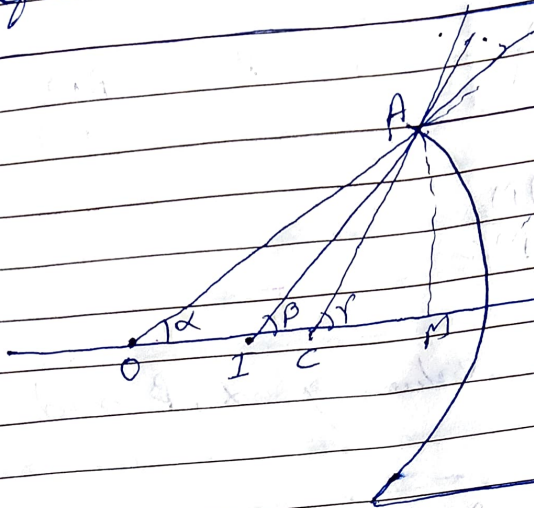


Refraction at a concave surface



From diagram

$\triangle AOC$

$$\gamma = \alpha + i$$

$$i = \gamma - \alpha \quad \text{--- (i)}$$

$\triangle ACI$

$$\gamma = \sigma + \beta$$

$$\sigma = \gamma - \beta \quad \text{--- (ii)}$$

$$\tan \alpha = \frac{AM}{OM}$$

$$\tan \beta = \frac{AM}{MI}$$

$$\tan \gamma = \frac{AM}{MC}$$

From first order theory