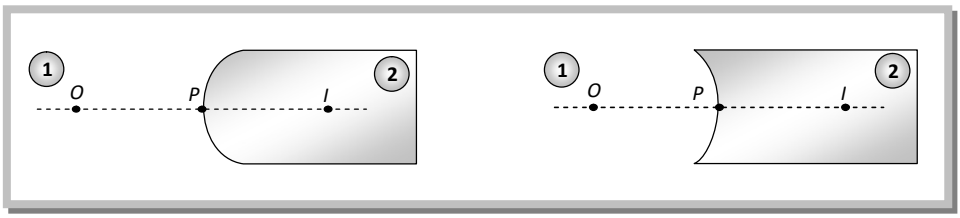
Refraction from Curved Surface.



μ_1 = Refractive index of the medium from which light rays are coming (from object).

μ_2 = Refractive index of the medium in which light rays are entering.

u = Distance of object, v = Distance of image, R = Radius of curvature

Refraction formula: $\frac{\mu_2 - \mu_1}{R} = \frac{\mu_2}{v} - \frac{\mu_1}{u}$ (use sign convention while solving the problem)

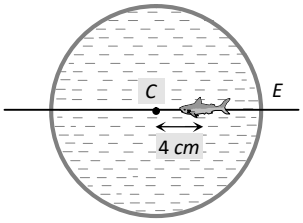
Note: Real image forms on the side of a refracting surface that is opposite to the object, and virtual image forms on the same side as the object.

Lateral (Transverse) magnification $m = \frac{I}{O} = \frac{\mu_1 v}{\mu_2 u}$.

Specific Example

In a thin spherical fish bowl of radius 10 cm filled with water of refractive index 4/3 there is a small fish at a distance of 4 cm from the center C as shown in figure. Where will the image of fish appears, if seen from E

(a) 5.2 cm (b) 7.2 cm (c) 4.2 cm (d) 3.2 cm



Solution: (a) By using $\frac{\mu_2}{v} - \frac{\mu_1}{u} = \frac{\mu_2 - \mu_1}{R}$

Where $\mu_1 = \frac{4}{3}, \ \mu_2 = 1, u = -6\,cm,$ v = ?

On putting values $v = -5.2\,cm$