index of Refraction

$n = \frac{c}{v}$

c: سرعة الضوء في الفراغ او الهواء (air or vaccum)

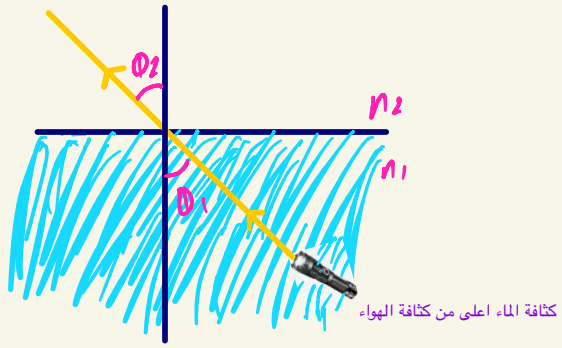
v: سرعة الضوء في الأوساط الأخرى

$c > v$

snell's Law

$\frac{n_1}{n_2} = \frac{\sin \theta_2}{\sin \theta_1}$

غالباً رح يعطيك قيمة يا n1 يا n2 الي ما بيعطيك قيمتها افرضها 1



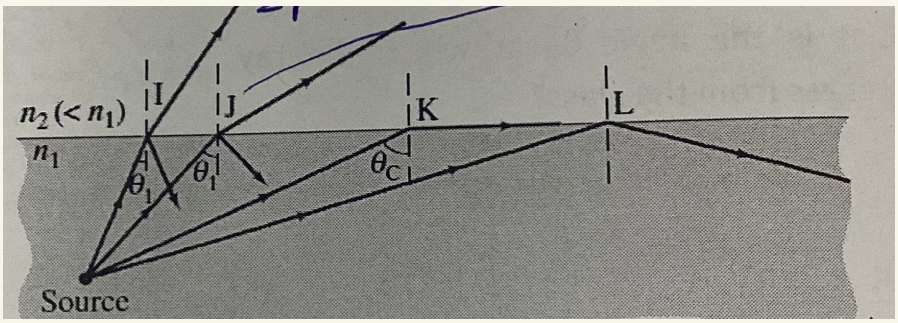
$n_1 > n_2$

$\downarrow \rho \longrightarrow \uparrow \rho$

$\theta_1 > \theta_2$

$\uparrow \rho \longrightarrow \downarrow \rho$

$\theta_2 > \theta_1$



- $n_1 > n_2$ Reflected light away form the normal
-
- angle c called critical angle theta equals 90 parrell to surface
-
- $\theta_1 > \theta_C$ No light reflected this called total internal reflection
-
- Total internal reflection occurs from $\uparrow \rho \longrightarrow \downarrow \rho$

Converging (convex) Lenses : محدبة

$d_o > f$ (Real inverted image)

❖ Converging Lens :

↳ A : Center of the lens

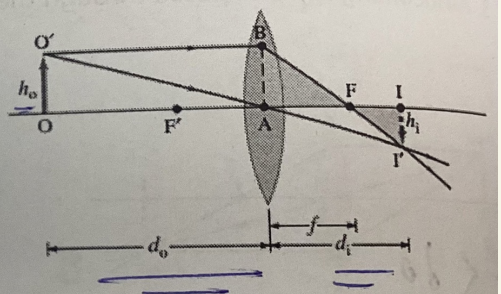
↳ F : Focal Length

↳ h_o : Height of object

↳ h_i : Height of image

↳ d_o : Distance of the object form the center of the lens.

↳ d_i : Distance of the image from the center of the lens.



$$\frac{h_i}{h_o} = \frac{d_i}{d_o}$$

Power lenses

$$P = \frac{1}{F} \quad (m^{-1})$$

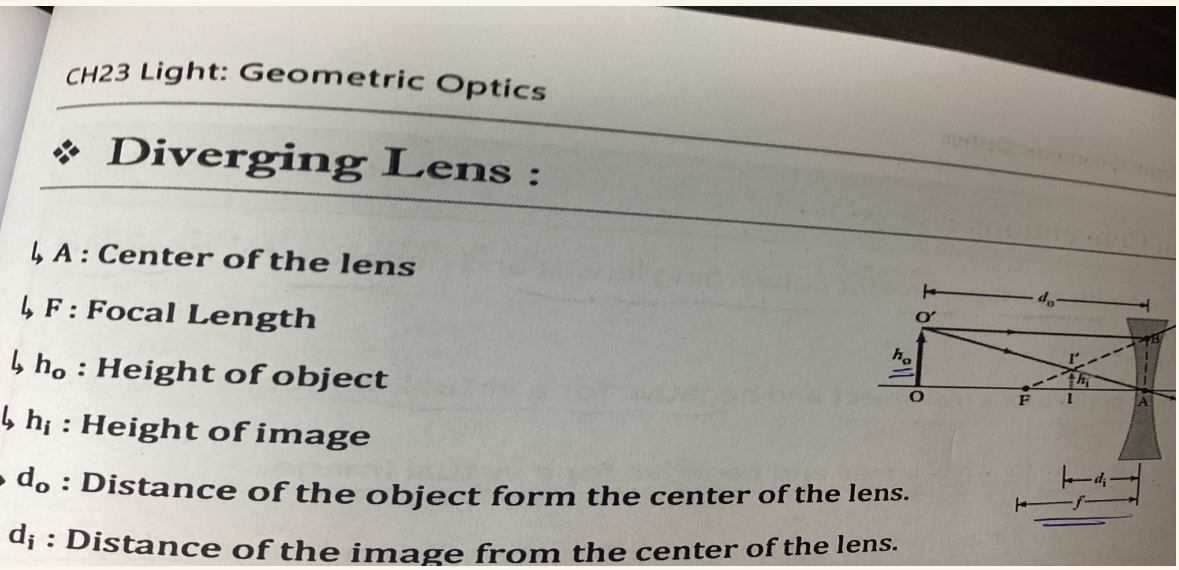
$$\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o}$$

بالنسبة

- if the object is so far away from the lens $d_o = \infty$ $\frac{1}{F} = \frac{1}{d_i}$
- h_i always taken upright and positive
- d_o positive always

diverging (Concave) Lensess : مقعرة

= f > d_o (virtual upright image)



CH23 Light: Geometric Optics

❖ **Diverging Lens :**

- ↳ A : Center of the lens
- ↳ F : Focal Length
- ↳ h_o : Height of object
- ↳ h_i : Height of image
- d_o : Distance of the object form the center of the lens.
- d_i : Distance of the image from the center of the lens.

$$\frac{hi}{ho} = \frac{di}{do}$$

h_i + upright

h_o - inverted

$$-\frac{1}{F} = \frac{1}{do} - \frac{1}{di}$$

magnification

$$m = \frac{hi}{ho} = \frac{-di}{do}$$

m is positive : Upright image

m is negative : inverted image