Verification:

Consider two parallel rays of light (in air) incident upon a reflecting surface as shown in figure. When $\boldsymbol{ray\ I}$ reaches to point $\boldsymbol{A}$, the $\boldsymbol{ray\ II}$ reaches to point $\boldsymbol{A'}$. Hence, $\boldsymbol{AA'}$ behave as the incident wavefront. Similarly, $\boldsymbol{BB'}$ behave as reflected wave front.

First law: As shown in figure, the incident ray ($\boldsymbol{ray\ I}$), the normal line and the reflected ray ($\boldsymbol{ray\ I}$), all meet at point $\boldsymbol{A}$ on the same plane. This verifies the first law of reflection.

Second law: In the time $\boldsymbol{ray\ I}$ travels from point $\boldsymbol{A\ to\ B'}$, the $\boldsymbol{ray\ II}$ travels from point $\boldsymbol{A'\ to\ B}$.

$\therefore \boldsymbol{AB' = A'B = ct}$ ……… (1) ; $\boldsymbol{c = speed\ of\ light\ in\ air.}$

In figure, in triangles $\Delta AA'B$ and $\Delta BB'A$,

$AB = AB$; Being common side

$A'B = AB' = ct$; Distance travelled by two light rays in same time in same medium.

$AA' = BB'$; Remaining sides

Hence, by **SSS** property these two triangles are congruent.

$\therefore \angle A'AB = \angle B'BA$

$i.e.,\ \boldsymbol{i = r}$ This verifies the second law of reflection of light.

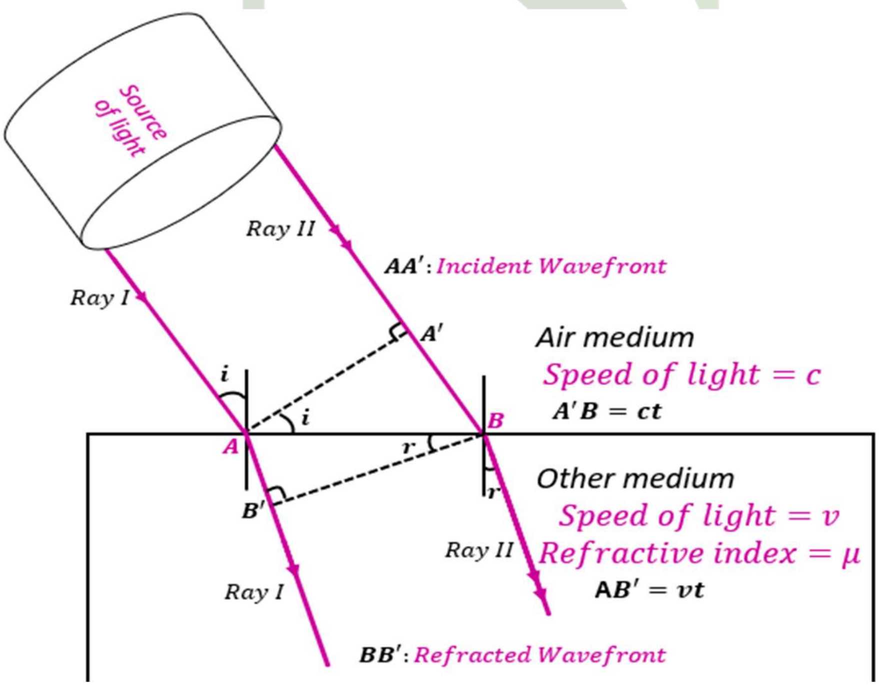
2. Verification of law refraction of light:

The laws of refraction of light are:

I. The incident ray, refracted ray and normal line all lie at same point in a same plane.

II. The ratio of sine of angle of incidence to sine of angle of refraction for a medium is always constant.

$$i.e.,\ \frac{\boldsymbol{Sin\ i}}{\boldsymbol{Sin\ r}} = a\ constant\ (\boldsymbol{\mu})$$



Rough:
Width if incident wavefront = AA'
Width if refracted wavefront = BB'