

Chapter 10

REFLECTION AND REFRACTION

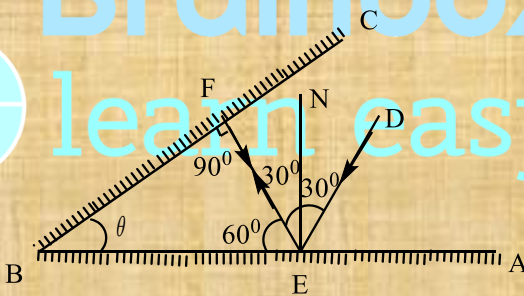
Example- 6:

Two plane mirrors are inclined to each other at some angle. A ray of light is incident on one of them at an angle 30° . The light after reflection falls on the second mirror and finally gets reversed. Find the angle between the mirrors.

Solution:

Let the mirrors AB and BC be inclined at angle θ in adjoining figure. Let DE be the incident ray which after reflection from mirror AB goes along EF. Draw NE normal on mirror AB. Then according to laws of reflection,

$$\angle DEN = \angle NEF = 30^\circ$$



As the ray EF gets reversed, so it must be falling normally on the second mirror BC. As NE is normal to AB,

$$\angle NEB = 90^\circ$$

$$\text{In } \triangle FBE, \angle EFB = 90^\circ$$

$$\therefore \angle FEB = 90^\circ - 30^\circ = 60^\circ$$

As the sum of the three angles of a triangle is two right angles or 180° , so $90^\circ + 60^\circ + \angle \theta = 180^\circ \Rightarrow \angle \theta = 30^\circ$

So, the two mirrors are inclined to each other at an angle of 30° .