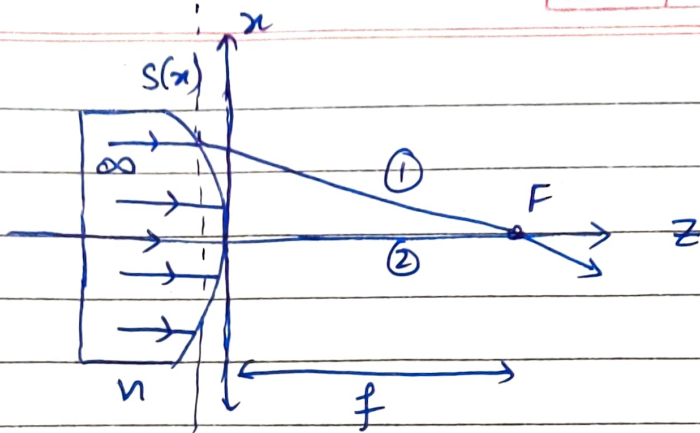


A-2:



The rays from infinity should follow the min. path before they meet at F. To find the shape function  $S(x)$  let us use Fermat's principle. It follows that all rays must follow the same path.

Considering rays ① + ② :

$$\Rightarrow f + ns = \sqrt{x^2 + (f+s)^2}$$

$$\Rightarrow (f + ns)^2 = x^2 + (f+s)^2$$

$$\Rightarrow \cancel{f^2} + n^2 s^2 + 2fns = x^2 + \cancel{f^2} + s^2 + 2fs$$

$$\Rightarrow s^2(n^2 - 1) + 2fns - 2fs - x^2 = 0$$

$$\Rightarrow s^2(n^2 - 1) + 2fs(n - 1) - x^2 = 0$$

$$\Rightarrow s^2 + \frac{2fs}{(n+1)} - \frac{x^2}{(n^2-1)} = 0$$

$$\Rightarrow s^2 + \frac{2fs}{(n+1)} - \frac{x^2}{(n^2-1)} + \left(\frac{f}{n+1}\right)^2 - \left(\frac{f}{n+1}\right)^2 = 0$$

$$\Rightarrow \left(s + \frac{f}{n+1}\right)^2 - \frac{x^2}{n^2-1} = \left(\frac{f}{n+1}\right)^2 \Rightarrow$$