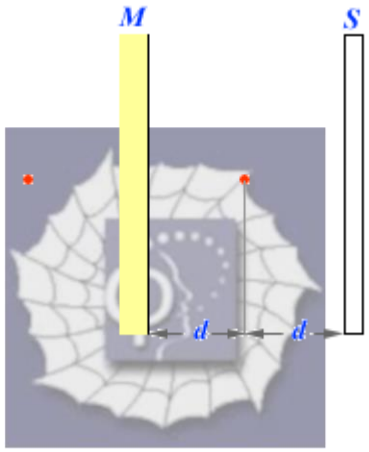
600.

Problem 43.35 (RHK)

A point source of light is placed at a distance d in front of a screen S. A mirror M is put behind the source at distance d from it; as shown in the figure. We have to find the change in intensity at the screen S.



Solution:

Let I_0 be the intensity of illumination because of the point source of light at the centre of the screen *S* in the absence of the mirror *M*. The distance of the point source from the screen *S* is *d*. When the mirror M is put at a distance *d* from the point source, the distance of the virtual image of the source from the screen will be 3*d*. As the point source radiates uniformly in all directions so will its image. As intensity of illumination from a point source varies inversely as square of distance from it, the

intensity at the centre of the screen when mirror is placed behind the point source will therefore be

$$I = I_0 + \frac{1}{9} I_0 = \frac{10}{9} I_0 .$$