44. At the point on the screen where we find the inner edge of the hole, we have $\tan\theta = 5.0\,\mathrm{cm}/30\,\mathrm{cm}$, which gives $\theta = 9.46°$. We note that d for the grating is equal to $1.0\,\mathrm{mm}/350 = 1.0\times10^6\,\mathrm{nm}/350$. From $m\lambda = d\sin\theta$, we find

$$m = \frac{d\sin\theta}{\lambda} = \frac{\left(\frac{1.0\times10^6\,\mathrm{nm}}{350}\right)(0.1644)}{\lambda} = \frac{470\,\mathrm{nm}}{\lambda}\ .$$

Since for white light $\lambda > 400\,\mathrm{nm}$, the only integer m allowed here is $m = 1$. Thus, at one edge of the hole, $\lambda = 470\,\mathrm{nm}$. However, at the other edge, we have $\tan\theta' = 6.0\,\mathrm{cm}/30\,\mathrm{cm}$, which gives $\theta' = 11.31°$. This leads to

$$\lambda' = d\sin\theta' = \left(\frac{1.0\times10^6\,\mathrm{nm}}{350}\right)\sin 11.31° = 560\ \mathrm{nm}\ .$$

Consequently, the range of wavelength is from 470 to 560 nm.