35. The ruling separation is $d = 1/(400\,\text{mm}^{-1}) = 2.5 \times 10^{-3}\,\text{mm}$. Diffraction lines occur at angles θ such that $d \sin\theta = m\lambda$, where λ is the wavelength and m is an integer. Notice that for a given order, the line associated with a long wavelength is produced at a greater angle than the line associated with a shorter wavelength. We take λ to be the longest wavelength in the visible spectrum (700 nm) and find the greatest integer value of m such that θ is less than 90°. That is, find the greatest integer value of m for which $m\lambda < d$. Since $d/\lambda = (2.5 \times 10^{-6}\,\text{m})/(700 \times 10^{-9}\,\text{m}) = 3.57$, that value is $m = 3$. There are three complete orders on each side of the $m = 0$ order. The second and third orders overlap.