

42. Referring to problem 41, we note that the angular deviation of a diffracted ray (the angle between the forward extrapolation of the incident ray and its diffracted ray) is $\psi + \theta$. For $m = 1$, this becomes

$$\psi + \theta = \psi + \sin^{-1} \left(\frac{\lambda}{d} - \sin \psi \right)$$

where the ratio $\lambda/d = 0.40$ using the values given in the problem statement. The graph of this is shown below (with radians used along both axes).

