(a) What is the maximum order that can be observed with a grating with 1550 lines/cm, using light with wavelength 475 nm.

\[ 13 \quad \text{(integer)} \]

(b) Calculate the polarizing angle for light of wavelength 650 nm for light in water \((n = 1.33)\) incident on a diamond \((n = 2.43)\).

\[ 61.0^\circ \]

(c) Calculate the focal length in water \((n = 1.33)\) for the glass \((n = 1.55)\) lens shown. You supply the signs for \(R\).

\[ 53.2 \, \text{m} \]

(d) Calculate the thickness of a quarter-wave plate for a material where \(n_e = 1.4700\) and \(n_o = 1.4750\) for \(\lambda = 590 \, \text{nm}\).

\[ 2.95 \times 10^{-5} \, \text{m} \]

(e) Five polarizers are arranged in a row. Completely unpolarized light is incident on the first. The angles between their axes are 10° each. What is the intensity of the emerging light as a fraction of \(I_o\)?

\[ I = 0.492I \]