

8. (a) Eq. 36-11 (in absolute value) yields

$$\frac{L}{\lambda} |n_2 - n_1| = \frac{(8.50 \times 10^{-6} \text{ m})}{500 \times 10^{-9} \text{ m}} (1.60 - 1.50) = 1.70 .$$

(b) Similarly,

$$\frac{L}{\lambda} |n_2 - n_1| = \frac{(8.50 \times 10^{-6} \text{ m})}{500 \times 10^{-9} \text{ m}} (1.72 - 1.62) = 1.70 .$$

(c) In this case, we obtain

$$\frac{L}{\lambda} |n_2 - n_1| = \frac{(3.25 \times 10^{-6} \text{ m})}{500 \times 10^{-9} \text{ m}} (1.79 - 1.59) = 1.30 .$$

(d) Since their phase differences were identical, the brightness should be the same for (a) and (b). Now, the phase difference in (c) differs from an integer by 0.30, which is also true for (a) and (b). Thus, their effective phase differences are equal, and the brightness in case (c) should be the same as that in (a) and (b).