

10. (a) We wish to set Eq. 36-11 equal to $\frac{1}{2}$, since a half-wavelength phase difference is equivalent to a π radians difference. Thus,

$$L_{\min} = \frac{\lambda}{2(n_2 - n_1)} = \frac{620 \text{ nm}}{2(1.65 - 1.45)} = 1550 \text{ nm} = 1.55 \mu\text{m} .$$

- (b) Since a phase difference of $\frac{3}{2}$ (wavelengths) is effectively the same as what we required in part (a), then

$$L = \frac{3\lambda}{2(n_2 - n_1)} = 3L_{\min} = 3(1.55\mu\text{m}) = 4.65 \mu\text{m} .$$