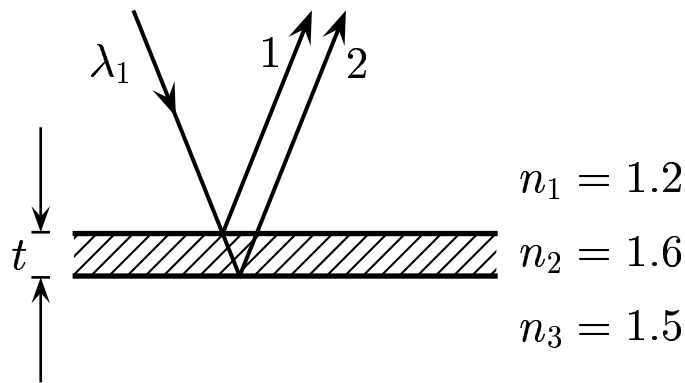


The incident ray is essentially perpendicular to the surface.



Based on $\phi_{path} = 2 k_2 t$, find the smallest thickness for a maximum.

- A) $t = \frac{n_1 \lambda_1}{4 n_2}$.
- B) $t = \frac{n_1 \lambda_1}{2 n_2}$.
- C) $t = \frac{n_1 \lambda_1}{n_2}$.
- D) $t = \frac{n_1 \lambda_1}{3 n_2}$.

the wavelength in vacuum is $\lambda = n_1 \lambda_1 = n_2 \lambda_2$. So $\lambda_2 = \frac{n_1 \lambda_1}{n_2}$. For the present case, $\phi_{refl} = \pi$. The maxima occur at $\phi_{path} = -\pi, \pi, 3\pi, \dots = 2t \times \frac{2\pi}{\lambda_2}$. For the smallest thickness, $\phi_{path} = \pi$. So $t = \frac{\lambda_2}{4} = \frac{n_1 \lambda_1}{4 n_2}$.

Answer **A**.