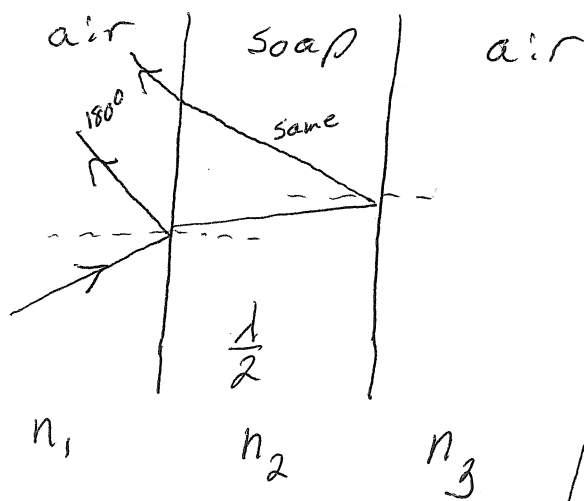


What minimum thickness of soap film
 ($n = 1.34$) would appear black if illuminated
 with 480 nm light?



$$2t = \lambda_{\text{min}} \quad d = vt \quad n = \frac{c}{v}$$

$$v = \frac{c}{n}$$

$$d = \frac{c t}{n}$$

$n_2 > n_1$ reflection phase shift

$n_3 < n_2$ no reflection phase shift

$$t_{\text{min}} = \frac{\lambda}{2n}$$

$$= \frac{480 \text{ nm}}{2(1.34)} = \boxed{179 \text{ nm}}$$