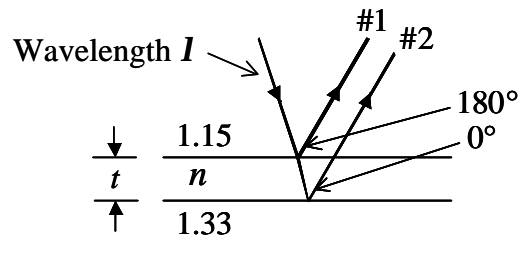


Quiz #5: Pratt's lecture, March 27, 2002



1. For the reflection phase shifts shown, which statement about n is correct?

- (a) $1.00 < n < 1.15$.
- (b) $1.15 < n < 1.33$.
- (c) **$1.33 < n$** .

For 180° reflection at 1.15/ n interface, one needs $1.15 < n$ —entering a region of higher index of reflection. For 0° reflection at $n/1.33$ interface, one needs $1.33 < n$ —entering a region of lower index of refraction. Thus (c) satisfies both requirements.

2. To have overall **constructive** interference between reflected rays #1 & #2, choose the equation you would use to find t , if you were given values of λ and n .

- (a) $nt = m\lambda$
- (b) $2nt = m\lambda$
- (c) $nt = (m+1/2)\lambda$
- (d) **$2nt = (m+1/2)\lambda$**

Because you already have a 180° relative phase shift due to the two reflections, you need a “ 180° ” relative phase shift as ray #2 travels a total distance of $2t$ [answer (d)]. This gives an overall constructive interference between the two rays.