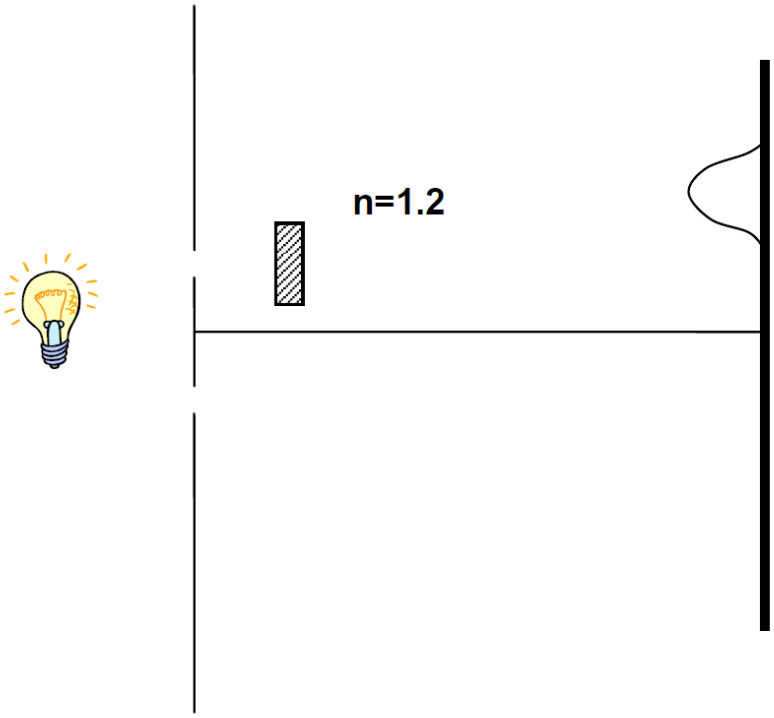
PHY431, Homework 7 DUE: Thursday, March 23, 2017

Interference

1. (4 pts) A two slit Young's experiment is arranged as illustrated below. The wavelength of the light is λ= 500 nm. When a thin film of a transparent material is put behind one of the slits, the zero order fringe moves to the position previously occupied by the 4th order bright fringe. The index of refraction of the film is n=1.2. Calculate the thickness of the film.



2. (4 pts) Sunlight incident on a screen containing two long narrow slits 0.20 mm apart casts a pattern on a white sheet of paper 2.0 m beyond. What is the distance separating the violet (λ= 400 nm) in the first-order band from the red (λ = 600 nm) in the second order band?
3. (2 pts) What would happen if Young had replaced the two slits with two long filament light bulbs?