PHY152H1S Winter 2017 – Practice Problem Set 10
(Based on material similar to Problem Set 10)

Ch. 32, Q. 37
A screen 1.0 m wide is 2.0 m from a pair of slits illuminated by 633-nm laser light, with the screen's center on the centerline of the slits. Find the highest-order bright fringe that will appear on the screen if the slit spacing is (a) 0.10 mm and (b) 10 μm.

Ch. 30, Q. 38
The prism in Fig. 30.22 has $n = 1.52$ and $\alpha = 60°$ and is surrounded by air. A light beam is incident at $\theta_1 = 37°$. Find the angle δ through which the beam is deflected.
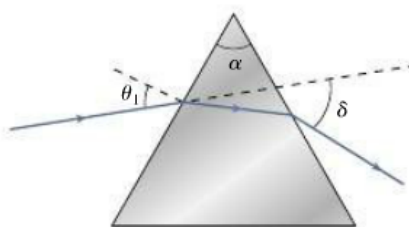

FIGURE 30.22 Problems 38 and 39

Questions not from Wolfson:

3. A 4.0-m-wide swimming pool is filled to the top. The bottom of the pool becomes completely shaded in the afternoon when the sun is 20° above the horizon. How deep is the pool?

4. A beam of light in a material with index of refraction n_1 is incident upon the flat surface of another material with index of refraction n_2.
    a. What is the condition that must be satisfied for total internal refraction to occur?
    b. If the condition for part (a) is satisfied, then there is a "critical angle" θ_c. If the angle of incidence is **less than** θ_c , what happens if to the light after it hits the boundary?
    c. If the angle of incidence is **greater than** θ_c , what happens if to the light after it hits the boundary?
    d. If the angle of incidence is **equal to** θ_c , what happens if to the light after it hits the boundary?