Homework is due in class. Do all problems and show your work. Credit is not given for answers only. You are welcome to work together, but be sure your homework is your work.

1. For the figure below, do the following:

   a) Create a table of the variables $u_0, z_0, y_1, i, i', R_1, R_2, \alpha$ and label them as positive or negative quantities as define by the sign conventions in class.

   b) Write an expression relating $i$ and $i'$.

   c) Write an expression for $\tan(u_0)$ in terms of the other variables.

   d) Write an expression for $\sin(-\alpha)$ in terms of the other variables.

2. What is the critical angle of the SF5 and N-BK7 glasses from homework 1?

3. The picture on the right shows a reflection of the desert in a window. This is a normal piece of glass and about 4% of the incident light is reflected. Explain why the reflection of the desert is so much brighter than the objects on the other side of the window.

4. The picture on the left shows a straight pole submerged in a swimming pool. Explain why the pole appears bent. Consider the rays of light from the camera’s perspective.