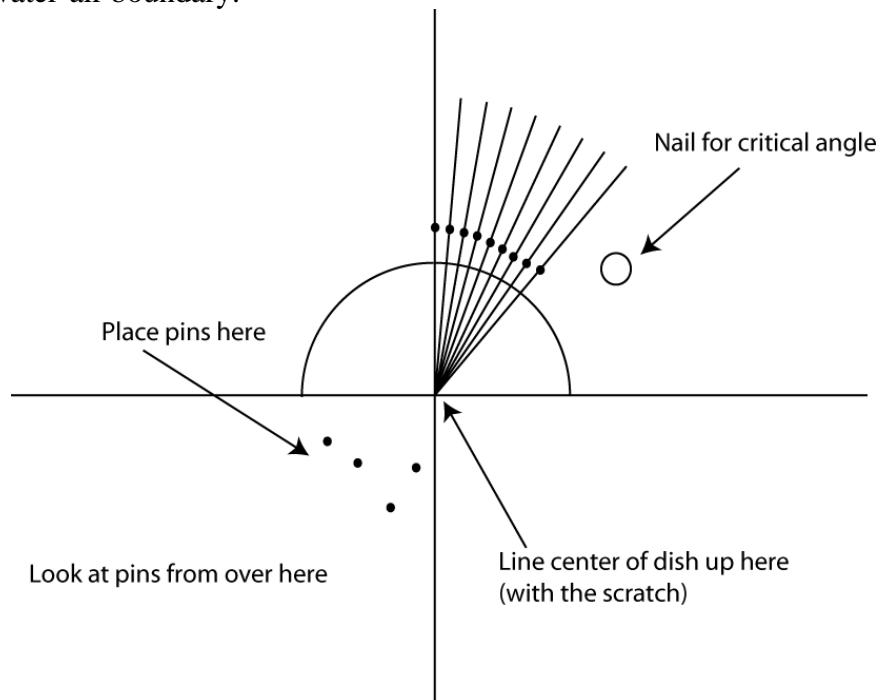


**AP Physics B**  
**Experiment, Snell's Law**

Name: \_\_\_\_\_

The purpose of this experiment is to determine the index of refraction of water and the critical angle for the water-air boundary.



Set up the cardboard, white paper, and semi-circular dish as shown. Draw lines in the first quadrant at intervals of  $5^\circ$ , from  $5^\circ$  to  $40^\circ$  with the y-axis. Place a pin along each line (including the y-axis), just beyond the edge of the disk.

With your eye on the flat side of the dish, look at the pins from the third quadrant through the water in the dish. For each angle, line the pin on the far side of the dish up with the scratch in the center of the dish, and place another pin in the third quadrant such that it lines up with the scratch and the far pin.

Place pins for all nine angles. Then, looking at a nail from the third quadrant, determine the critical angle. Mark the nail's position in the first quadrant.

Using a graphical method, determine the index of refraction of water and compare it with the accepted value. From the measured index of refraction, calculate the critical angle and compare your calculate and measured values.

This experiment requires a minimal report. Please include the following:

- (1) Title/Names/etc.
- (2) Purpose
- (3) Data
- (4) Analysis: Make a graph and from it determine the index of refraction of water. Calculate the critical angle from your calculated index of refraction. Find percent error where appropriate.