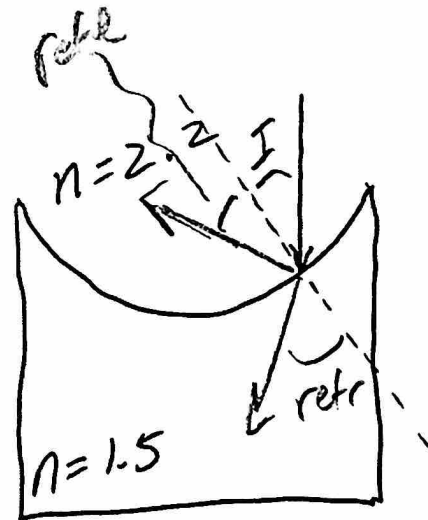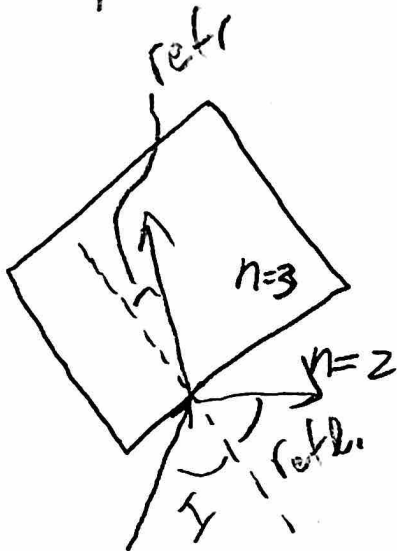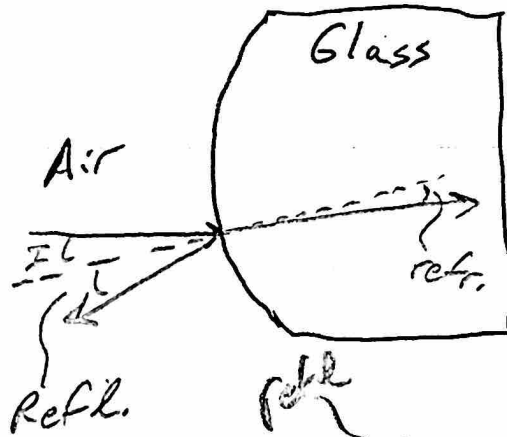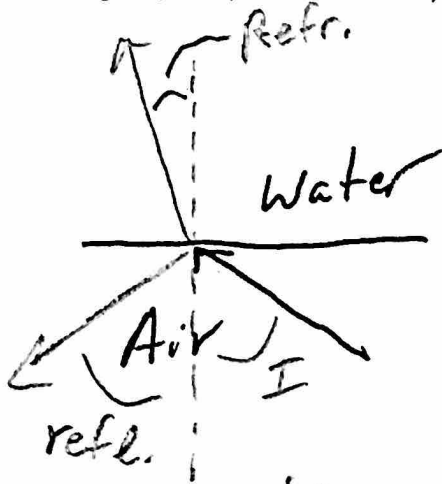Physics 100
Refraction Practice

For each diagram, draw/label the **normal**, the **angle of incidence**, angle of refraction, and the **angle of reflection**.

Given that the speed of light in a vacuum is is C = 3x10⁸ m/s....

1. Find the speed of of light in a substance with n = 1.8.

$$V = \frac{C}{n} = \frac{3 \times 10^8 m/s}{1.8} = 1.67 \times 10^8 m/s$$

2. Find the speed of of light in a substance with n = 2.3.

$$V = \frac{C}{n} = \frac{3 \times 10^8 m/s}{2.3} = 1.30 \times 10^8 m/s$$

3. Find the value of n for a substance in which the speed of light is 1.38x10⁸m/s. Identify this substance.

$$n = \frac{C}{V} = \frac{3 \times 10^8 m/s}{1.38 m/s} = 2.17 \quad Cubic\ Zircovian$$

4. Find the value of n for a substance in which the speed of light is 0.85 x10⁸m/s. Identify this substance using the table on the right.

$$n = \frac{C}{V} = \frac{3 \times 10^8 m/s}{0.85 \times 10^8 m/s} = 3.53 \quad Silicon$$

TABLE 23.1 Indices of refraction

Medium	n
Vacuum	1.00 exactly
Air (actual)	1.0003
Air (accepted)	1.00
Water	1.33
Ethyl alcohol	1.36
Oil	1.46
Glass (typical)	1.50
Polystyrene plastic	1.59
Cubic zirconia	2.18
Diamond	2.41
Silicon (infrared)	3.50