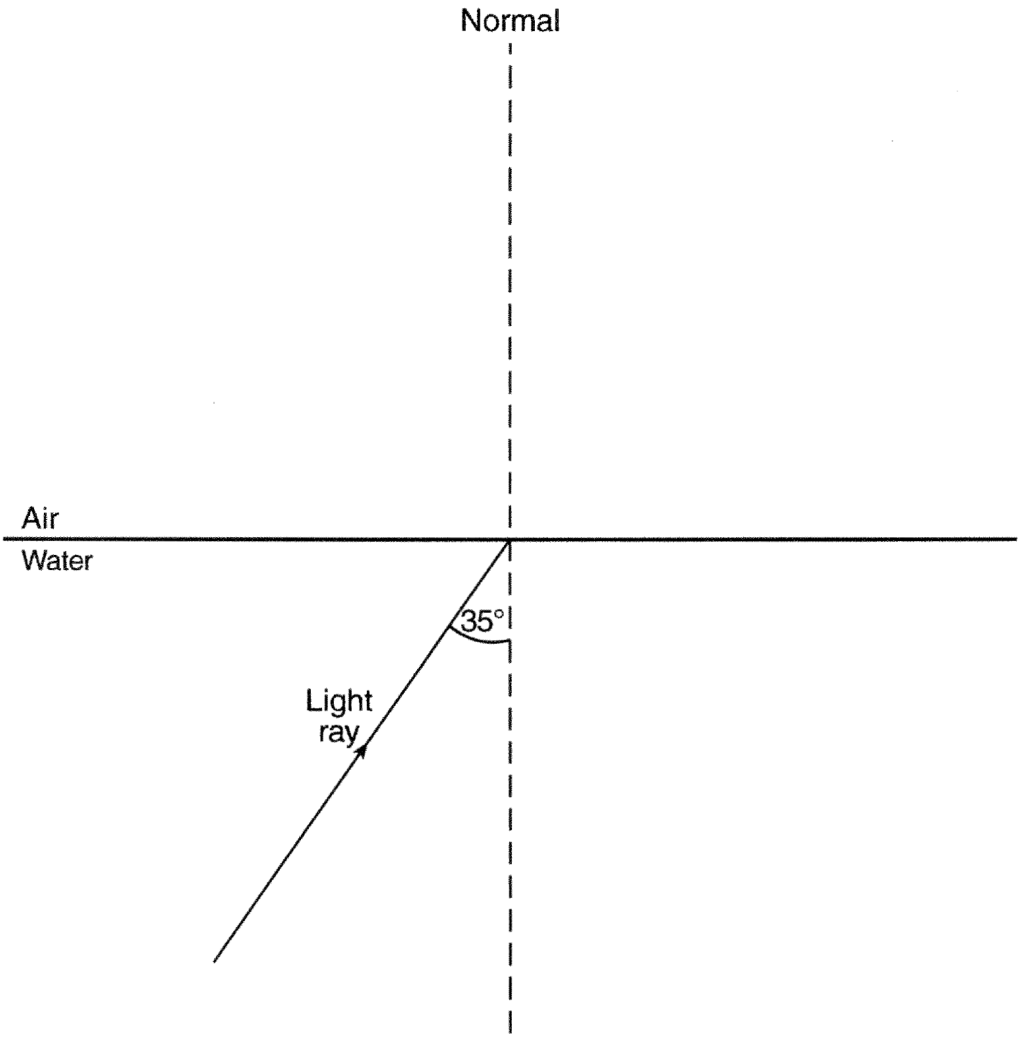
Name **Part 2 Review H**

Base your answers to questions **1** through **4** on the information below.

A light ray with a frequency of 5.09×10^{14} hertz traveling in water has an angle of incidence of 35° on a water-air interface. At the interface, part of the ray is reflected from the interface and part of the ray is refracted as it enters the air.



1. Identify *one* characteristics of this light ray that is the same in *both* the water and the air.

2. Calculate the angle of refraction of the light ray as it enters the air. [Show all work, including the equation and substitution with units.]

3. On the diagram, using a protractor and a straightedge, draw the reflected ray.

4. What is the angle of reflection of the light ray at the interface?

Part 2 Review H

Base your answers to questions **5** through **7** on the information below.

A stationary research ship uses sonar to send a 1.18×10^3-hertz sound wave down through the ocean water. The reflected sound wave from the flat ocean bottom 324 meters below the ship is detected 0.425 second after it was sent from the ship.

5. Determine the period of the sound wave in the ocean water.

6. Calculate the wavelength of the sound wave in the ocean water. [Show all work, including the equation and substitution with units.]

7. Calculate the speed of the sound wave in the ocean water. [Show all work, including the equation and substitution with units.]