PHY431, Practice MT 1

I. GEOMETRICAL OPTICS

1. (3 pts) Three identical converging lenses offocal length f are aligned and separated by a distance f from each other. An object is located $f/2$ in front of the leftmost lens. Find the position and magnification of the image.

2. (3 pts) A thin lens having a focal lenght of 50 cm is positioned 250 cm to the left of a plane mirror. An ant sits on the central axis 250 cm to the left of the lens. Locate the three images of the ant.

3. (4 pts) A small fish, 12 cm below the surface of Lake Michigan is viewed through a simple thin converging lens with focal length of 90 cm. If the lens is 6 cm above the water surface, where is the image of the fish seen by the observer ? What is its magnification ? Assume that the fish lies on the optical axis of the lens, and that n=4/3 for water.