Question 4.

A spherical aquarium, filled with water, is placed in front of a flat vertical mirror. The radius of the aquarium is R, and the distance between its center and the mirror is $3R$. A small fish, which is initially at the point nearest to the mirror, starts to move with velocity v along the wall. An observer looks at the fish from a very large distance along a horizontal line passing trough the center of the aquarium.

What is the relative velocity v_{rel} at which the two images of the fish seen by the observer will move apart? Express your answer in terms of v. Assume that:

- The wall of the aquarium is made of a very thin glass.
- The index of refraction of water is $n = 4/3$.