

Answers to selected questions

Chapter 17

Q6. No. If light rays are diverging when they strike the mirror, they will still be diverging upon reflection. A plane mirror cannot bring light rays to a focus.

Q12. To the fish, the image appears to lie farther from the water surface than the actual position of the object. The light rays coming from the object in air are bent toward the surface normal when they enter the water. This makes it seem like they are diverging from a point farther above the water surface. ($i = o n_2 / n_1$, where n_2 is greater than n_1 .)

Q18. Yes. A magnified virtual image is formed by a positive lens when the object is placed between the focal point and the lens.

Q24. The magnified image will be farther from the observer than the object because the image is behind the mirror when the object is placed inside the focal point of a concave mirror.

Q30. Yes. The objective lens forms a magnified real image inside the microscope that is then viewed through the eyepiece lens, which acts like a magnifying glass in viewing the real image formed by the objective lens.