[1] (a) Which of the thin lenses shown below has the longer focal length?.
(b) What is the focal length of a plane mirror?.

[2] Two mirrors face each other across a square room. An infinite series of reflections can be seen.
(a) Explain these reflections in terms of images.
(b) Why do the ones that seem further away also seem dimmer

[3] When a converging lens is immersed in water, does its focal length change? Explain and make a drawing showing how the angles of the rays at the interfaces differ for the two cases.

[4] An object is placed 16.0 cm from a screen.
(a) At what two points between the object and screen may a converging lens with a focal length \( f = +3.50\text{cm} \) be placed to obtain an image on the screen?
(b) What are the magnifications of the image for both positions of the lens?

[5] A zoom lens comprises a converging first lens of focal length \( f_1 = 12.0\text{cm} \) followed by a diverging lens of focal length \( f_2 = -18.0\text{cm} \). The second lens is placed 2.0 cm behind the first lens. An object 2.00mm tall is placed 100.0 cm to the left of the first (converging) lens.
(a) How far from this first lens is the final image formed?
(b) Is the final image real or virtual?
(c) Is the final image erect or inverted?
(d) What is the height of the final image?

[6] If you have normal vision you cannot see clearly underwater without a mask or goggle.
(a) Explain the reason.
(b) If you wore eyeglasses, without goggles, could they be made so that you could see, and would the lens have to be converging or diverging?

[7] (a) Where is the near point of an eye for which a contact lens with power of +2.75 diopter is prescribed?
(b) Where is the far point of an eye for which a contact lens with a power of -0.830 diopter is prescribed for distant vision?
(c) Which of these two eyes is myopic?