

## Chapter 23 Problems Set

1. Does your bathroom mirror show you older or younger than your actual age? If you are 1.5555555m from the mirror, what is the difference in age between you and the image?
2. Why the image out of focus when you take a picture of something in a mirror with an auto-focus camera?
3. How could you make a solar oven from tin foil... from lenses? Draw sketches.
4. A concave spherical mirror has a curvature of 20.0cm. Describe the images of an object placed at 40.0cm, 20.0cm and 10.0cm, include magnification, orientation and real vs. virtual.
5. A child looks into a 60.0cm diameter gazing ball in the garden. Describe the child's image if she is 1.00m tall and 1.00 away from the ball?

6. A glass double convex lens ( $n=1.50$ ) has a curvature of  $15.0\text{cm}$  for the incidence side and  $10.0$  for the refraction side. Find the focal length of the lens in air. Determine the position of the images at infinity,  $3f$ ,  $f$  and  $f/2$ .

7. The same as problem 6 but a double concave lens.