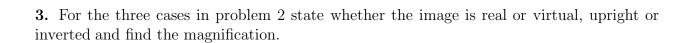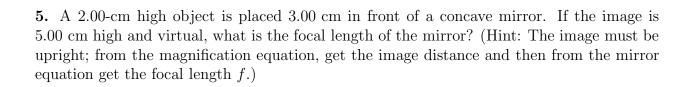# Phys 2020 (NSCC), Spring 2008
Problem Set #8

1. A convex mirror has a radius of curvature of 0.550 m. Locate and describe the image of a person who is 10.0 m from the mirror. Find the magnification of the image.
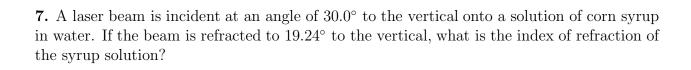
2. A concave spherical mirror has a radius of curvature of 20.0 cm. Locate the images for object distances of: (a) 40.0 cm, (b) 20.0 cm, and (c) 10.0 cm.

3. For the three cases in problem 2 state whether the image is real or virtual, upright or inverted and find the magnification.

4. A dentist uses a mirror to examine a tooth that is 1.00 cm in front of the mirror. The image of the tooth is 10.0 cm behind the mirror. Determine (a) the mirror's radius of curvature and (b) the magnification of the image.

5. A 2.00-cm high object is placed 3.00 cm in front of a concave mirror. If the image is 5.00 cm high and virtual, what is the focal length of the mirror? (Hint: The image must be upright; from the magnification equation, get the image distance and then from the mirror equation get the focal length f.)

6. A ray of light is incident on the surface of a block of clear ice (index of refraction 1.309) at an angle of 40.0° with the normal. Find the angle (with the normal) of the refracted ray.

7. A laser beam is incident at an angle of 30.0° to the vertical onto a solution of corn syrup in water. If the beam is refracted to 19.24° to the vertical, what is the index of refraction of the syrup solution?

8. In problem 7, if the light is red with wavelength 632.8 nm, find the speed, and wavelength of the light *in the solution*.