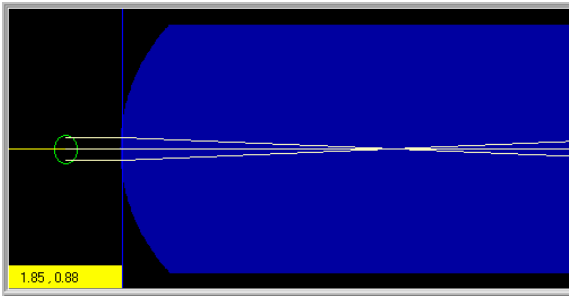# Worksheet for Exploration 34.3: Towards Building a Lens

Light rays from a beam source, initially in air, are incident on a material of different index of refraction **(position is given in meters)**. You can change the curvature of the surface of the material as well as the index of refraction. Restart.

a. Move the slider to decrease the curvature of the blue material. What happens when the edge is curved more (the radius gets smaller)?

When the curvature is 1, where is the point where all the rays converge (a focal point)?

b. Increase the index of refraction. When the curvature is 1, where is the point where all the rays converge?

If the index of refraction is 1, what happens? Why?

c. Mathematically, the relationship between this focal point inside the curved material, the curvature of the surface and the radius of curvature of the surface is given by $f = nR/(n - 1)$. Verify this expression with the animation.

n =_____

R =_____

nR/(n-1) =_____

f =_____

How a surface focuses light, then, depends both on the index of refraction as well as the curvature of the material.