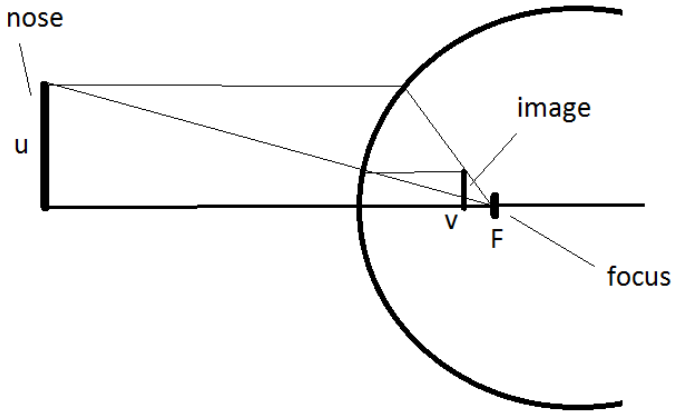
Answer to Question #78532, Physics / Electromagnetism

You hold a spherical salad bowl $90\ cm$ in front of your face with the bottom of the bowl facing you. The salad bowl is made of polished metal with a $35\ cm$ radius of curvature.

(a) Where is the image of your $2.0\ cm$ tall nose located?

Answer:



(b) What are the image's size, orientation, and nature (real or virtual)?

Solution.

$$\frac{1}{u}-\frac{1}{v}=-\frac{2}{R}$$

$$R=35\ cm; u=2\ cm$$

v is size of image

$$v=\frac{uR}{R+2u}=\frac{2\cdot 35}{35+2\cdot 2}=\frac{70}{39}\ cm$$

Orientation of image: vertical
Since the nose is located at the distance from the bowl which is more than focus, then the image is real:

$$focus: f=\frac{R}{2}=\frac{35}{2}=17.5\ cm$$

$$f<90\ cm$$