

55. The sphere (of radius 0.35 m) is a convex mirror with focal length $f = -0.175$ m. We adopt the approximation that the rays are close enough to the central axis for Eq. 35-4 to be applicable. We also take the “1.0 m in front of ... [the] sphere” to mean $p = 1.0$ m (measured from the front surface as opposed to being measured from the center-point of the sphere).
- (a) The equation $1/p + 1/i = 1/f$ yields $i = -0.15$ m, which means the image is 15 cm from the front surface, appearing to be *inside* the sphere.
 - (b) and (c) The lateral magnification is $m = -i/p$ which yields $m = 0.15$. Therefore, the image distance is $(0.15)(2.0 \text{ m}) = 0.30$ m; that this is a positive value implies the image is erect (upright).