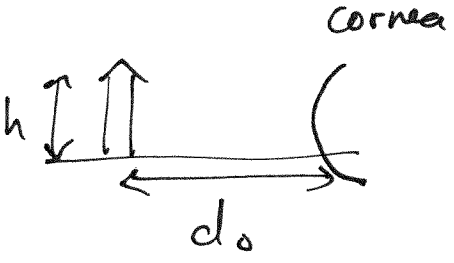
Ch.2 Prob. 37

$h_o = 1.50\ cm$

$d_o = 3.00\ cm$

$h_i = 0.167\ cm$



a) Find the magnification

$$m = \frac{-d_i}{d_o} \rightarrow m = \frac{h_i}{h_o} = \frac{0.167\ cm}{1.50\ cm} = \boxed{0.111}$$

b) Where is the image?

Using $m = \frac{-d_i}{d_o} \rightarrow d_i = -m d_o = -(0.111)(3.00\ cm)$

$$= \boxed{-0.333\ cm}$$

The negative indicates that the image is virtual.

c) Find the radius of the cornea

Using the image equation, find the focal distance

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{3.00\ cm} + \frac{1}{-0.333\ cm} = -2.67\ \frac{1}{cm}$$

$$f = \frac{1}{-2.67\ \frac{1}{cm}} = \boxed{-0.375\ cm}$$

The negative indicates that the surface is convex.

To get a radius of curvature, double the focal length

$$R = 2f = 2(-0.375\ cm) = -0.75\ cm$$

The radius of curvature is $\boxed{0.75\ cm}$