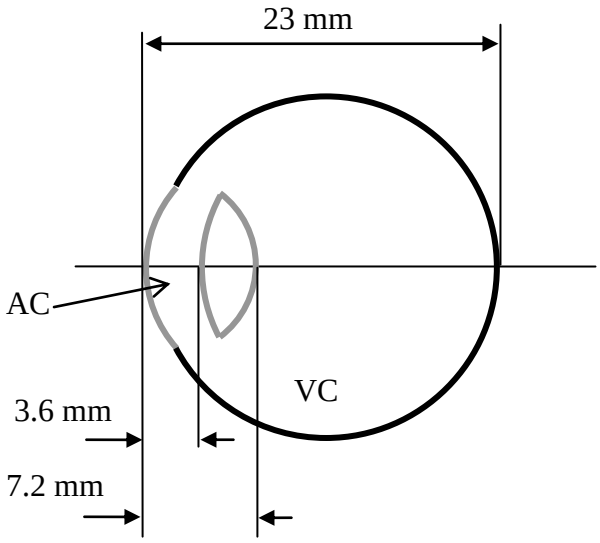
WS 22

Physics 322
The eye



Cornea	Radius = 8 mm
Anterior chamber (AC)	Index= 1.33
Front surface of lens	Radius = 10mm relaxed, 6mm tensed
Back surface of lens	Radius = 6 mm
Index of refraction of lens	Index = 1.45
Vitreous chamber (VC)	Index = 1.33

The lens is held under constant tension. When you focus your eye, you relieve that tension and the lens becomes symmetric. The cornea is really a very thin layer.

Accommodation is our ability to change the focus of our eye. This is done by varying the lens shape.

1) Calculate the refractive power of the "cornea." You may want to consider a single refracting surface. Determine what this would mean for an eye that did not have the "lens."

2) Calculate the refractive power of the lens for both the relaxed and tensed situations.

What is the change in power of the eye due to accommodation?

3) Using your two previous results, calculate the overall refractive power of the eye. With a relaxed eye, where would incident parallel light focus? With the tensed eye, what is the closest an object could be and still focus on the retina?

4) If we wanted to set up a model of the eye in air using a single lens, what focal length lens would you use?