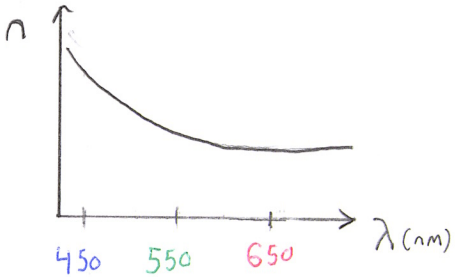
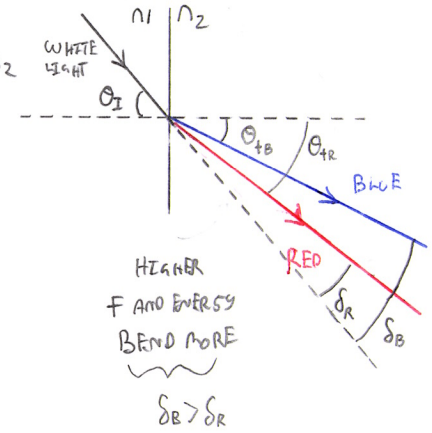
DISPERSION

- IN A VACUUM LIGHT OF ALL WAVELENGTHS TRAVEL AT THE SAME SPEED, C.
- IN A MEDIUM THE EFFECTIVE SPEED IS SLIGHTLY DIFFERENT FOR DIFFERENT WAVELENGTHS OF LIGHT.
- DISPERSION – THE DEPENDENCE OF THE EFFECTIVE SPEED OF LIGHT AND THE INDEX OF REFRACTION ON THE WAVELENGTH.
- GENERAL TREND

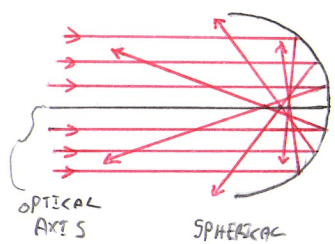


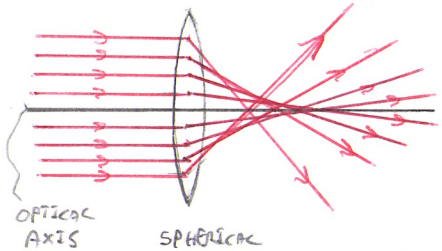
EX| $n_1 < n_2$



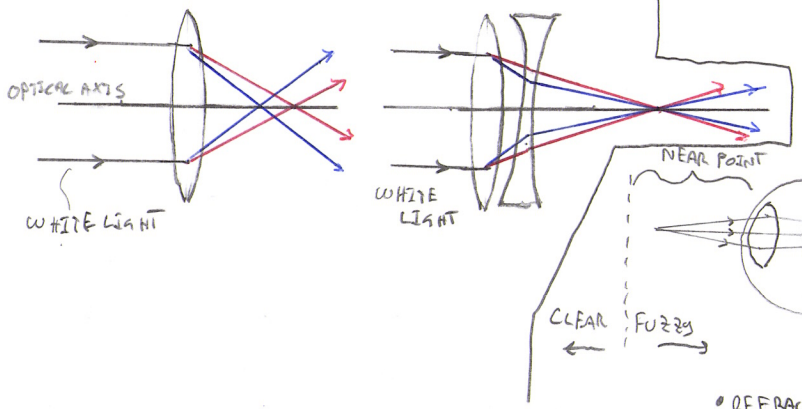
LENS ABERRATIONS

- SPHERICAL ABERRATION – SINGLE WAVELENGTH LIGHT PARALLEL TO OPTICAL AXIS DOES NOT ALL CONVERGE ON THE FOCAL POINT DUE TO THE SPHERICAL SHAPE OF THE LENS/MIRROR. THE GEOMETRY OF THE LENS/MIRROR CAN BE ADJUSTED TO MINIMIZE EFFECT; PARABOLIC SHAPE IS MUCH BETTER.
  - EXAMPLES:



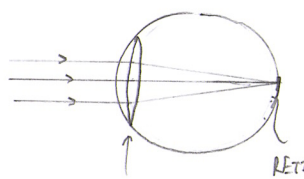


- CHROMATIC ABERRATION – IN A GIVEN MEDIUM THE INDEX OF REFRACTION IS DIFFERENT FOR DIFFERENT WAVELENGTHS OF LIGHT SO WHITE LIGHT WILL "SPLIT" INTO DIFFERENT WAVELENGTHS WHEN PASSING THROUGH A LENS AND EACH λ WILL CROSS AT A DIFFERENT POINT ON THE OPTICAL AXIS. USE ANOTHER LENS TO MINIMIZE EFFECT.
  - EXAMPLE:

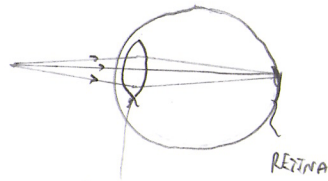


EYE AS AN OPTIC ELEMENT

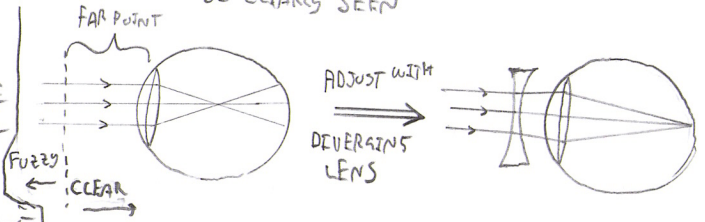
- FOCUS ON DISTANT OBJECTS



- FOCUS ON NEAR OBJECTS



- NEARSIGHTED (MYOPIC)
  - FAR POINT – FURTHEST DISTANCE (MEASURED FROM THE EYE LENS) AT WHICH AN OBJECT CAN BE CLEARLY SEEN



- FARSIGHTED (HYPEROPIC)
  - NEAR POINT – CLOSEST DISTANCE (MEASURED FROM THE EYE LENS) AT WHICH AN OBJECT CAN BE SEEN CLEARLY

- REFRACTED POWER $\left[\frac{1}{L}\right] \equiv P = \frac{1}{f}$ (f: FOCAL LENGTH OF LENS)
  - CORRECTIVE LENS PRESCRIBED BY POWER, NOT FOCAL LENGTH
  - UNIT IS "DIOPTER"