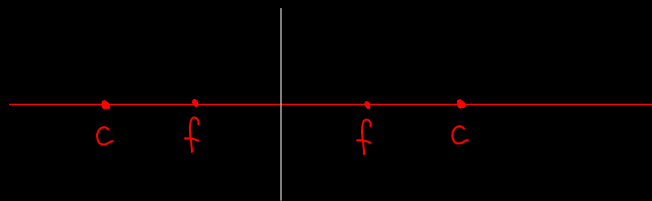


# Lenses

- Types of Lenses
    - Convex (Converging)
    - Concave (Diverging)
- 

# Lenses

- Parts
  - Focal Point
  - Center of curvature ( $R = 2f$ )
    - not used in reference to drawing rays

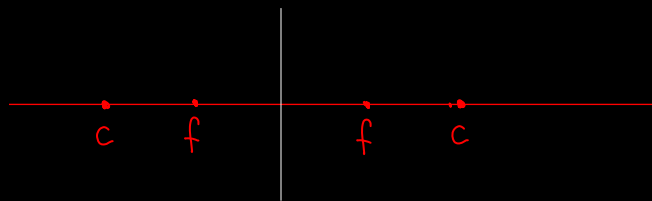


## Lenses

- Chromatic Aberration
  - The index of refraction decreases with increasing wavelength.
  - Shorter wavelengths bend more than longer wavelengths.

## Lenses

- Rays
  - Parallel  $\Rightarrow$  in  $\parallel$  out through  $f$
  - Focal  $\Rightarrow$  in through  $f$  out  $\parallel$
  - Central in and out through the center of lens



# Spherical Mirrors

- Equations

- Lens Maker Equation  $\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$

- Magnification  $M = \frac{h_i}{h_o} = -\frac{d_i}{d_o}$

