_ definition of optical lenses : The lens is a transparent optical medium with a homogeneous refractive index. It works to deflect the ray incident on it at a certain angle, and one of its surfaces must be curved, either concave or convex.

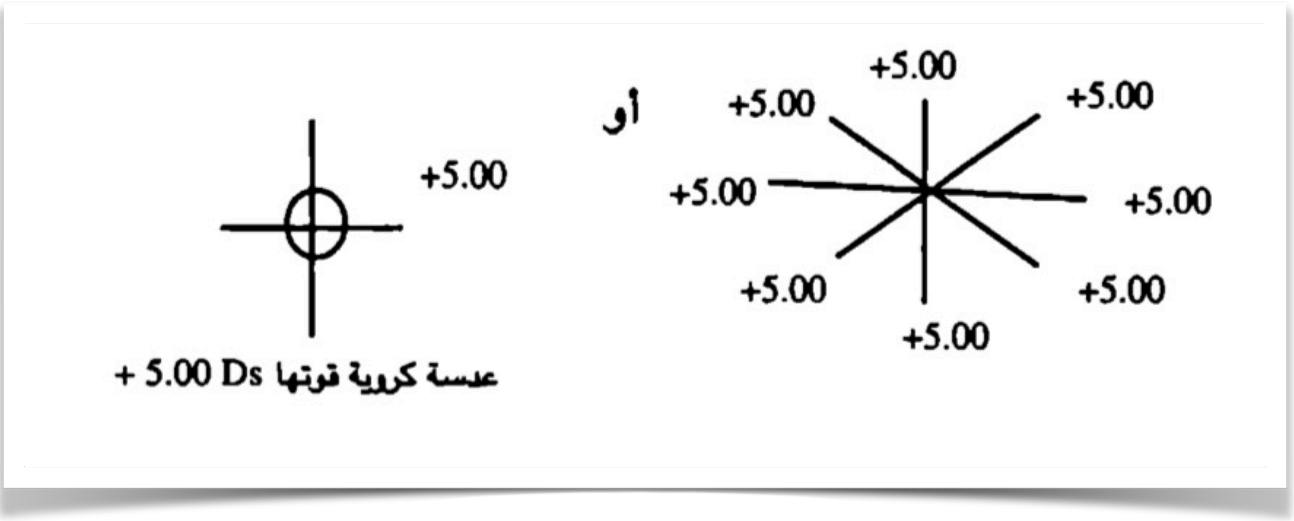
_ types of lenses
1.spherical lenses and there is two types of spherical lenses

A- concave lenses
B- convex lenses

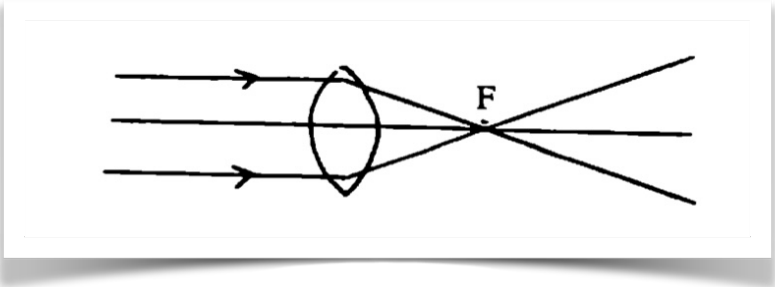
2_ Aspherical lenses and there is two types of Aspherical lenses

A- cylindrical lenses
B- toric lenses

spherical lens is a lens in which all meridians are equal in all directions in power

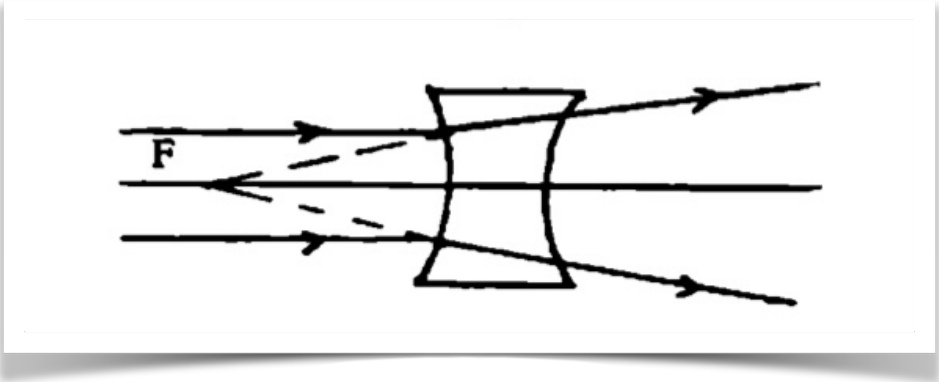


_ spherical convex lens It is the lens that collects parallel incident light rays to a focus located behind the lens



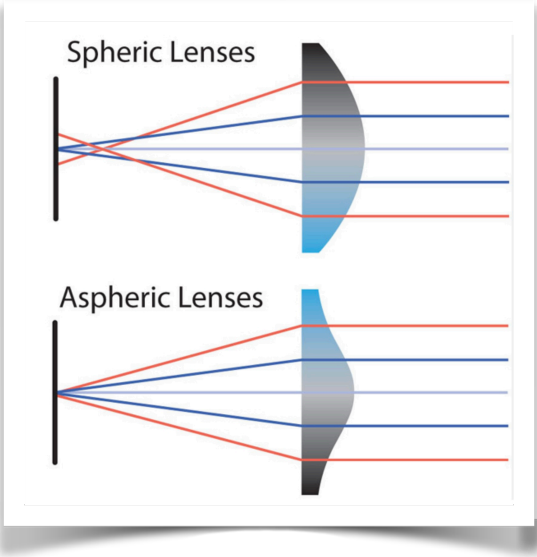
Convex lens

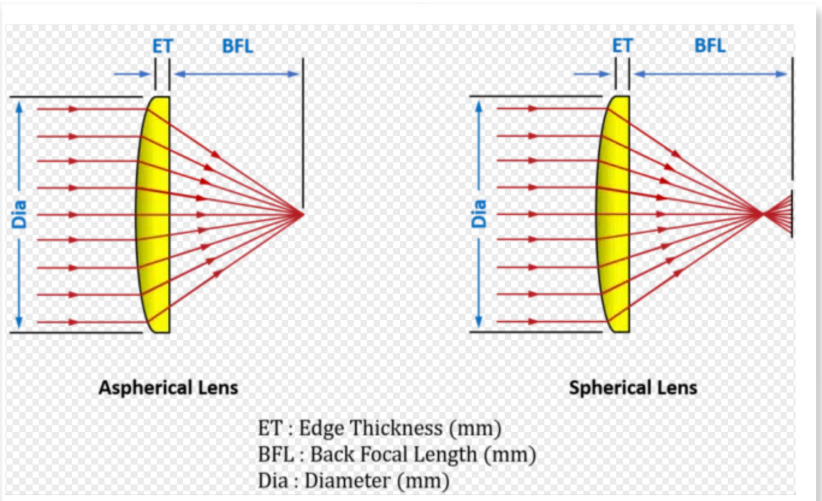
_ spherical concave It is the lens that collects parallel incident light rays to a focus located in front the lens



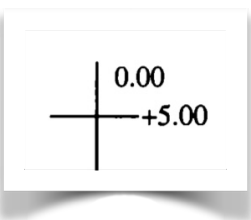
Concave lens

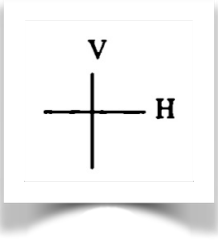
_Aspherical lens is a lens in which the power in one meridian and there is power in other meridian



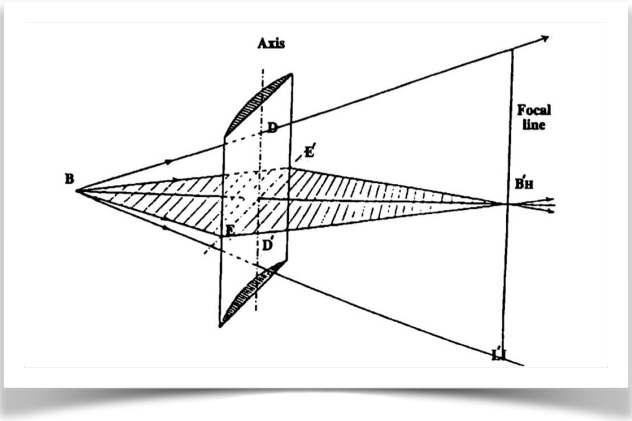


- vertical meridian
- Horizontal meridian



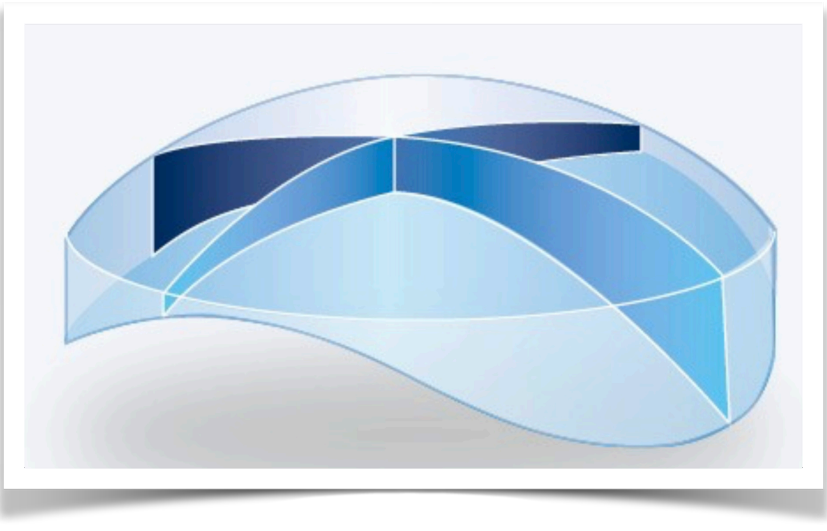


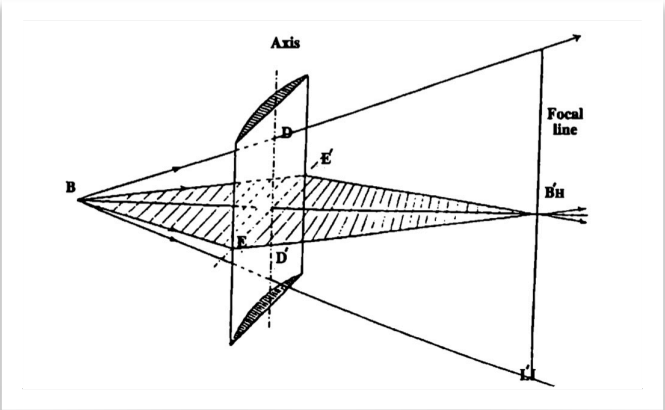
- Aspherical cylinder lens is make linear focus



Refraction by cylindrical lens , line focus

- Toric lens ,is consist from one surface sphere and other surfaces aspheric





Refraction by cylindrical lens , line focus