

Front

Back

Real Area

Virtual Area

(All items have + signs)

(All items have - signs)

Mirror



Image Properties include three features

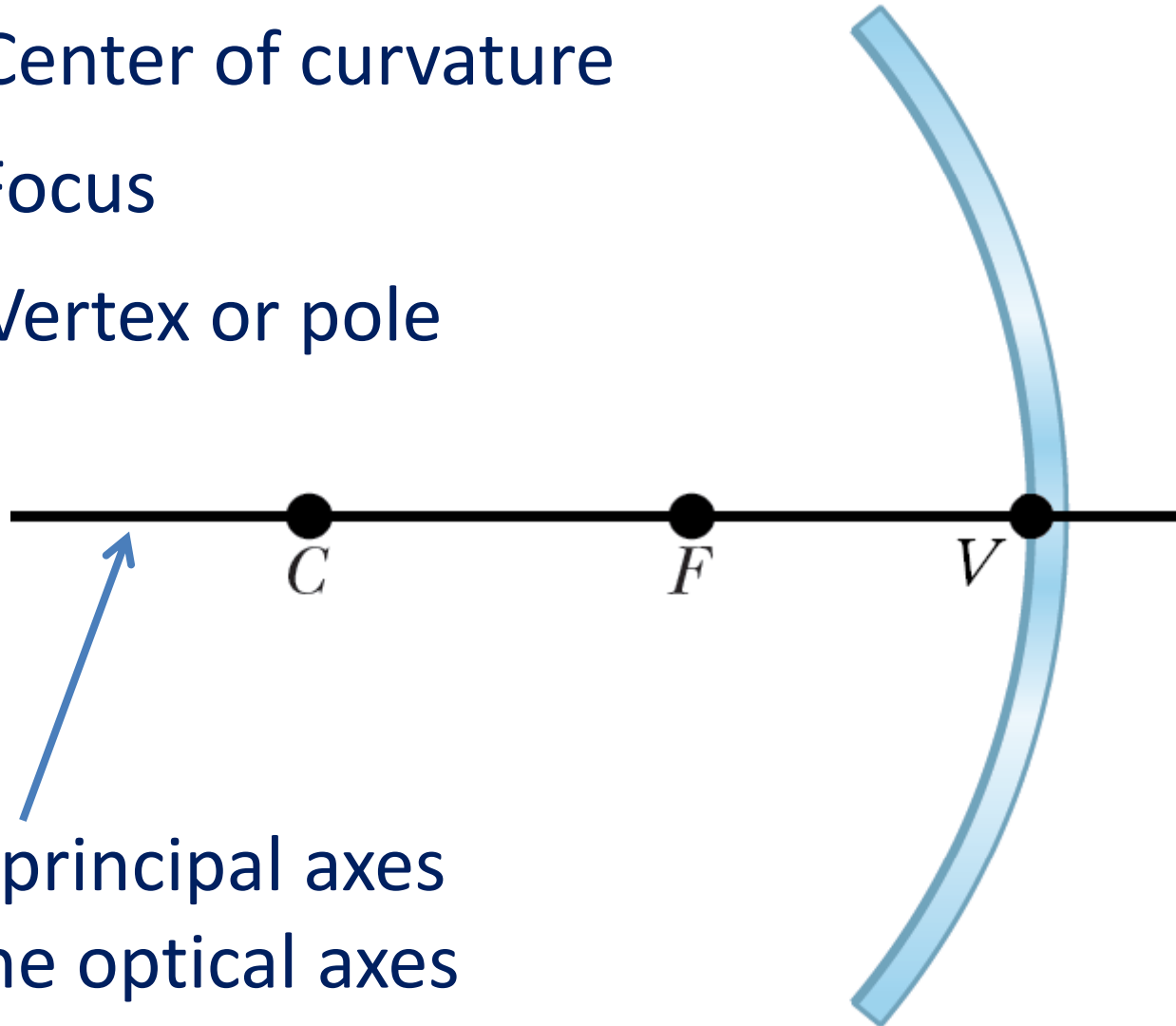
- Image Type
 - Real (image formed at the front of the mirror)
 - Virtual (image formed at the back of the mirror)
- Image Posture
 - Erect (M have a + sign)
 - Inverted* (M have a - sign)
- Image Magnification
 - Smaller ($M < 1$)
 - Equal ($M = 1$)
 - Larger ($M > 1$)

* inverted \neq reversed : inverted (up & down), whereas reversed (right & left).

C : Center of curvature

F : Focus

V : Vertex or pole



The principal axes
or the optical axes

Images Properties in Mirrors

Mirror Type	Object position	Image Characteristics	Notes
Convex	at any distance	Virtual , Erect , Smaller	Image Characteristics DO NOT depend on the position of the object in front of the mirror
Plane	at any distance	Virtual , Erect , Equal	
Concave	before F	Virtual , Erect , Larger	Image Characteristics DO depend on the position of the object in front of the mirror
	at F	NO IMAGE	
	between F & C	Real , Inverted , Larger	
	at C	Real , Inverted , Equal	
	after C	Real , Inverted , Smaller	

Sign Conventions for Spherical Mirrors

Quantity	Positive (+)	Negative (-)
Focal length (f)	mirror is concave	mirror is convex
Image location (S_i)	image is real (image is in front of the mirror)	image is virtual (image is at back of the mirror)
Image height (h_i)	image is erect	image is inverted
Magnification (M)	image is erect	image is inverted

Magnification (M)

- $> 1 \rightarrow$ image is **LARGER**
- $= 1 \rightarrow$ image is **EQUAL**
- $< 1 \rightarrow$ image is **SMALLER**

NOTE:

- (S_o) is always (+) because the object is always in front of the mirror, i.e. **real**.
- (h_o) is always (+) because the object is always **erect**.