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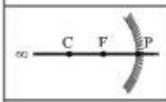
Position, size and nature of image formed by the spherical mirror

Mirror	Location of the object	Location of the image	Magnification, Size of the image	Nature	
				Real / virtual	Erect / inverted
(a) Concave	At infinity i.e. $u = \infty$	At focus i.e. $v = f$	$m << 1$, diminished	Real	inverted
	Away from centre of curvature ($u > 2f$)	Between f and 2f i.e. $f < v < 2f$	$m < 1$, diminished	Real	inverted
	At centre of curvature $u = 2f$	At centre of curvature i.e. $v = 2f$	$m = 1$, same size as that of the object	Real	inverted
	Between centre of curvature and focus : $F < u < 2f$	Away from the centre of curvature $v > 2f$	$m > 1$, magnified	Real	inverted
	At focus i.e. $u = f$	At infinity i.e. $v - \infty$	$m - \infty$, magnified	Real	inverted
	Between pole and focus $u < f$	$v > u$	$m > 1$ magnified	Virtual	erect
(b) Convex	At infinity i.e. $u = \infty$	At focus i.e., $v = f$	$m < 1$, diminished	Virtual	erect
	Anywhere between infinity and pole	Between pole and focus	$m < 1$, diminished	Virtual	erect

Use following sign while solving the problem

	Concave mirror		Convex mirror
	Real image ($u \geq f$)	Virtual image ($u < f$)	
Distance of object	$u \rightarrow -$	$u \rightarrow -$	$u \rightarrow -$
Distance of image	$v \rightarrow -$	$v \rightarrow +$	$v \rightarrow +$
Focal length	$f \rightarrow -$	$f \rightarrow -$	$f \rightarrow +$
Height of object	$O \rightarrow +$	$O \rightarrow +$	$O \rightarrow +$
Height of image	$I \rightarrow -$	$I \rightarrow +$	$I \rightarrow +$
Radius of curvature	$R \rightarrow -$	$R \rightarrow -$	$R \rightarrow +$
Magnification	$m \rightarrow -$	$m \rightarrow +$	$m \rightarrow +$

4.2 Relation between f and R

In figure, P is pole, C is centre of curvature and F is principal focus of a concave mirror of small aperture. Let a ray of light AB be incident on the mirror in a direction parallel to the principal axis of the mirror. It gets reflected along. BF. Join CB. It is normal to the mirror at B.

Note:- Do practice to learn the rays diagram to show the formation of images of an object placed at different places in case of spherical mirror. You have already learnt it in Class X. However reflection of light has been removed from syllabus but it must be learnt.