PHYSICS – LIGHT REFLECTION AND REFRACTION

Name:	Grade: 10 Sec:	Date:

SPHERICAL LENS
FORMULAS::

1. Lens Formula: $1/f = 1/v - 1/u$
 * Where f, v and u are the focal length, image distance and object distance.

2. Magnification (m): m= $\underline{\text{Size of image}(h_i)}$ = $\underline{h_i}$ = $\underline{v}$
                          Size of object (h_o) h_o u
* Magnification, m is −ve for real and inverted images and +ve for virtual and erect images.

SIGN CONVENTION FOR SPHERICAL LENSES

Convex		Concave
Real image (u > or = f)	Virtual image (u < f)	
Distance of Object u = − ve	u =− ve	u = −ve
Distance of Image v = + ve	v =− ve	v = −ve
Focal Length f = + ve	f = + ve	f = −ve
Height of Object h_o = + ve	h_o = +ve	h_o = +ve
Height of Image h_i = −ve	h_i = + ve	h_i = +ve
Magnification m = − ve	m = + ve	m = +ve

:: *NUMERICALS::*

Q.1. An object of 2cm height is kept in front of a convex lens which produces a magnification of 0.5. Calculate the size of image. Will the image be erect or inverted? Give reasons for your answers?

Q.2. How far should an object be placed from a convex lens of focal length 20cm to obtain its image at a distance of 30cm from the lens? What will be the height of the image if the object is 6cm tall?

Q.3. A convex lens has a focal length of 10cm. At what distance from the lens should the object be placed so that it forms a real and inverted image 20cm away from the lens? What would be the size of the image formed if the object is 2cm high?

Q.4. An object of height 2cm is placed perpendicular to the principal axis of a concave lens of focal length 15cm use lens formula to determine the position size and nature of the image if the distance of the object from the lens is 10cm.

Q.5. A concave lens of focal length 15cm forms an image 5cm from the lens. How far is the object placed from the lens? Draw a ray diagram.