

Refraction through a Lens

Chapter 5: Refraction through a Lens · Topic 1

Key Concept

The lens formula, $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$, relates object distance (u), image distance (v), and focal length (f) for both convex and concave lenses.

Convex (converging) lenses can form real or virtual images depending on object position, used in magnifying glasses and cameras.

Concave (diverging) lenses always form virtual, diminished, upright images, commonly used to correct short-sightedness (myopia).

Magnification ($m = v/u = \text{height of image}/\text{height of object}$) tells us how much larger or smaller the image is compared to the object.

Quick Revision Notes

- Lens formula: $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$.
- u =object distance, v =image distance, f =focal length.
- Convex lenses converge light.
- They can form real or virtual images.
- Concave lenses diverge light.
- They always form virtual, diminished images.
- Concave lenses correct myopia.
- Magnification = v/u = image height/object height.

Practice Questions

- 1 Calculate image distance using the lens formula given u and f.
- 2 Calculate magnification given image and object heights.
- 3 Discuss the difference between convex and concave lenses.
- 4 Research how eyeglasses use lenses to correct vision.
- 5 Draw a ray diagram for a convex lens.
- 6 Explain lens formula in your own words.