

Lenses

Chapter 7: Lenses · 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, cameras, and correcting long-sightedness.

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

Magnification ($m=v/u$) tells us how much larger or smaller the image is compared to the object, useful in optical instrument design.

Quick Revision Notes

- Lens formula: $1/v - 1/u = 1/f$.
- u =object distance, v =image distance, f =focal length.
- Convex lenses converge light.
- Form real or virtual images, correct long-sightedness.
- Concave lenses diverge light.
- Always form virtual, diminished images.
- Correct myopia (short-sightedness).
- Magnification: $m=v/u$.

Practice Questions

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