Week 11

Prerequisite knowledge

Please revise the following sections from Giambattista Physics (5th ed.). New York: McGraw-Hill:

- Section 23.1 Wavefronts, Rays, and Huygens's Principle.
- Section 23.2 The Reflection of Light.
- Section 23.3 The Refraction of Light: Snell's Law.

Detailed learning goals

By completing this topic, you should be able to:

- Determine magnification of a lens given the focal length
- Determine focal length and magnification given radius of curvature, distance of object and image
- Explain the mathematical expression that relates focal length of a lens or mirror, the object distance, and the image distance
- Use this Thin-Lens equation to solve thin-lens and mirror problems
- Explain the workings of a basic camera
- Explain the image formation by the eye.
- Calculate refractive power
- Analyse and explain the accommodation of the eye for distant and near vision
- Explain corrections for near-sightedness and far-sightedness
- Explain angular and apparent size.
- Calculate angular magnification
- Explain how a simple magnifier works
- Calculate angular magnification of a simple magnifier
- Explain how an image is formed in a compound microscope.
- Calculate the angular magnification of the microscope
- Explain the 'power' of a microscope.

Prescribed readings for SLE123 content

Please read the following sections from Giambattista Physics (5th ed.). New York: McGraw-Hill:

- Section 23.8 Spherical Mirrors.
- Section 23.9 Thin Lenses.
- Section 24.2 - Cameras.
- Section 24.3 The Eye.
- Section 24.4 - Angular Magnification and the Simple Magnifier.
- Section 24.5 Compound microscopes.

SLE123 – Week 11 - Practice questions:

1. The lens in the figure below is used to produce a real image of a candle flame. What is the focal length of the lens?

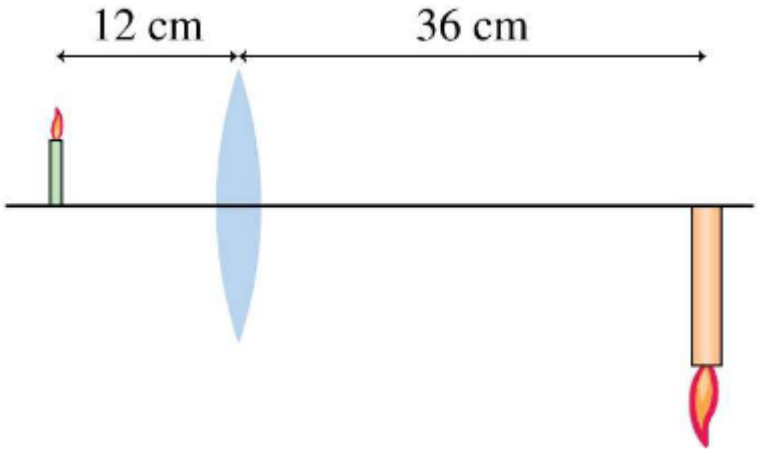
a. 9.0 cm

b. 12 cm

c. 24 cm

d. 36 cm

e. 48 cm



2. A converging lens of focal length 35 cm is used to form a real image 0.80 m away from the lens. How far from the lens is the object?

a. 62 cm

b. 72 cm

c. 80 cm

d. 35 cm

3. Calculate the image position and height for a 2.0-cm-tall object 40 cm in front of a converging lens that has a 20 cm focal length.

4. Calculate the image position and height for a 1.0-cm-tall object 10 cm in front of a diverging lens that has a -10 cm focal length.