

1. A spherical mirror has a focal length of 10.0 cm. (i) Locate and describe the image for an object distance of 25.0 cm. (ii) Locate and describe the image for an object distance of 10.0 cm. (iii) Locate and describe the image for an object distance of 5.00 cm.

2. An automobile rearview mirror shows an image of a truck located 10.0 m from the mirror. The focal length of the mirror is -0.60 m. (i) Find the position of the image of the truck. (ii) Find the magnification of the image.

3. A converging lens has a focal length of 10.0 cm. (i) An object is placed 30.0 cm from the lens. Construct a ray diagram, find the image distance, and describe the image. (ii) An object is placed 10.0 cm from the lens. Find the image distance and describe the image. (iii) An object is placed 5.00 cm from the lens. Construct a ray diagram, find the image distance, and describe the image.

4. A diverging lens has a focal length of 10.0 cm. (i) An object is placed 30.0 cm from the lens. Construct a ray diagram, find the image distance, and describe the image. (ii) An object is placed 10.0 cm from the lens. Construct a ray diagram, find the image distance, and describe the image. (iii) An object is placed 5.00 cm from the lens. Construct a ray diagram, find the image distance, and describe the image.

5. Two thin converging lenses of focal lengths $f_1 = 10.0$ cm and $f_2 = 20.0$ cm are separated by 20.0 cm. An object is placed 30.0 cm to the left of lens 1. Find the position and the magnification of the final image.