

## CHECK YOUR LEARNING

For each of these questions, draw a ray diagram to check your answer.

1. A converging lens has a focal length of 23 cm. A frog is 32 cm from the lens. Use the thin lens equation to calculate where the image of the frog will be located. **T/I C**
2. A pencil is located 53 cm from a diverging lens. An upright, virtual image of the pencil is observed 18 cm from the lens. Use the thin lens equation to calculate the focal length of this lens. **T/I C**
3. A diverging lens has a focal length of 34 cm. An upright, virtual image of a small booklet is located 13 cm behind the lens. Where is the booklet located? **T/I C**
4. A converging lens has a focal length of 16 cm. An insect is located 11 cm from the lens. Where will the image of the insect be located? **T/I C**
5. A vase of height 12 cm is placed in front of a converging lens. An inverted image of height 35 cm is noticed on the other side of the lens. **T/I C**
  - (a) Use the magnification equation to calculate the magnification of the lens.
  - (b) What type of image is it?
6. A playing card of height 14 cm is placed in front of a converging lens. An inverted, real image of height 7.9 cm is noticed on the other side of the lens. What is the magnification of the lens? **T/I C**
7. A postage stamp of height 2.8 cm is placed in front of a diverging lens. A virtual image of height 1.3 cm is noticed on the same side of the lens as the stamp. **T/I C**
  - (a) What is the magnification of the lens?
  - (b) What is the attitude of the image?
8. A small fork is placed 9.4 cm in front of a lens. An upright, virtual image of the fork with a magnification of 5.6 times is observed. **K/U T/I C**
  - (a) Where is the image located?
  - (b) What is the focal length for this lens?
  - (c) What kind of lens is this? Explain.