

Javier Duarte, Department of Physics  
University of California San Diego  
Physics 2C, Winter 2020

**Reading Assignment due Tuesday 3/3:** Submit via Gradescope by 11:30am

You might find the following simulation useful for understanding lenses:

<https://phet.colorado.edu/en/simulation/geometric-optics>

1. The main equation for Sections 34.5-34.6 is the Lens Equation

$$\frac{1}{s} + \frac{1}{s'} = \frac{1}{f}$$

Answer the following questions about the terms in the equation. For each question, answer it in a way that works for both CONVERGING as well as DIVERGING lenses. Note: don't just copy down Figure 34.30.

- (a) What is  $s$ ? When is it positive and when is it negative?
  - (b) What is  $s'$ ? When is it positive and when is it negative?
  - (c) What is  $f$ ? When is it positive and when is it negative?
2. A diverging lens has a focal length of magnitude 10.0 cm. Suppose an object is placed a distance 5.0 cm from the lens.
    - (a) Draw a ray diagram for this scenario. Use a ruler or straight-edge (fold a piece of paper to get a straight edge). Use a single upright arrow as the object. Draw at least 2 (principle) rays. If light doesn't actually pass through a line, but appears to have originated from a place, use a dotted line (see the far left diagram of Figure 34.36).
    - (b) Is the image real or virtual? Inverted or upright? Reduced or enlarged?

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**For extra practice (not due):** From Chapter 34 of Knight, 4th edition: Conceptual Questions: 6-8. Exercises: 21-27, 31-37.