Physics 11

PLC Activity #14: Lenses and Mirrors

To get credit for this activity, you must show your answers to a PLC tutor and have them initial the sign-out sheet ***before 4:00 pm on Monday.***

Show all of your work for each question.

1) **Physlet Problem 33.4**
A dragable object is located to the left of a mirror. You can click-drag both the position and height of the object **(position is given in meters and angle is given in degrees)**. Find the focal length of the mirror.

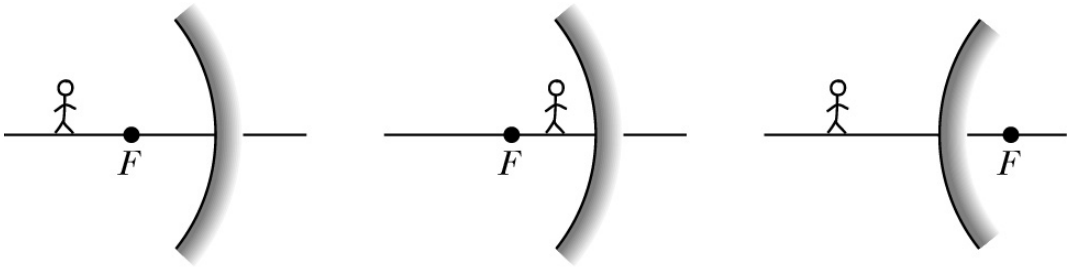
2) A toy soldier is placed, in turn, in front of four mirrors, A, B, C, and D. The following table gives the object distances *s* and the corresponding image distances s', all in centimeters. **(a)** Rank the mirrors according to the height of the image, greatest first. **(b)** Which mirrors produce an image of the toy soldier that could appear on a sheet of paper?

	A	B	C	D
s	2	4	2	6
S'	4	-8	-6	2

a)

b)

3) The figure below shows three situations in which the stick figure stands in front of a spherical mirror; the focal points F are indicated. For each situation, determine whether **(a)** the focal length, **(b)** the image distance, and **(c)** the magnification are positive or negative.



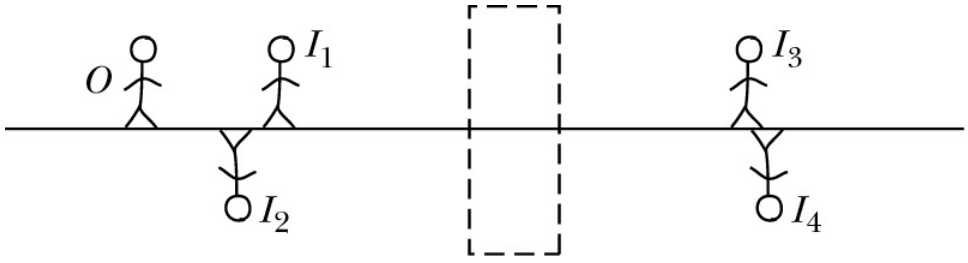
(1) (2) (3)

a) **a)** **a)**

b) **b)** **b)**

c) **c)** **c)**

4) In the figure below, stick figure 0 stands in front of a thin lens that is mounted within the boxed region; the central axis through the thin lens is shown. The four stick figures I_1 to I_4 suggest general locations and orientations for the images that might be produced by the lens. (***The figures are only sketched in; neither their heights nor their distances from the mirror are drawn to scale***.) **(a)** Which of the stick figures could not possibly represent images? Of the possible images, **(b)** which would be due to a converging lens, **(c)** which would be due to diverging lens, **(d)** which would be virtual, and **(e)** which would involve negative magnification?



a)

b)

c)

d)

e)