CENGAGE | WEBASSIGN

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← **PHYS 2401, section 201, Summer 2 2022**

Mirrors and Lenses (Homework)

🎓 **INSTRUCTOR**
Keith West
Texas Tech University

Current Score

QUESTION	1	2	3	4	5	6	7
POINTS	–/5	–/15	–/6	–/3	–/1	–/2	–/4

TOTAL SCORE

–/36	0.0%

Due Date

THU, AUG 4, 2022
11:59 PM CDT

📅 Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

Your last submission is used for your score.

1. **[–/5 Points]**   DETAILS   **SERPSE10 35.1.P.003.**

MY NOTES   ASK YOUR TEACHER

A periscope (see figure below) is useful for viewing objects that cannot be seen directly. It can be used in submarines and when watching golf matches or parades from behind a crowd of people. Suppose the object is a distance p_1 from the upper mirror and the centers of the two flat mirrors are separated by a distance h.
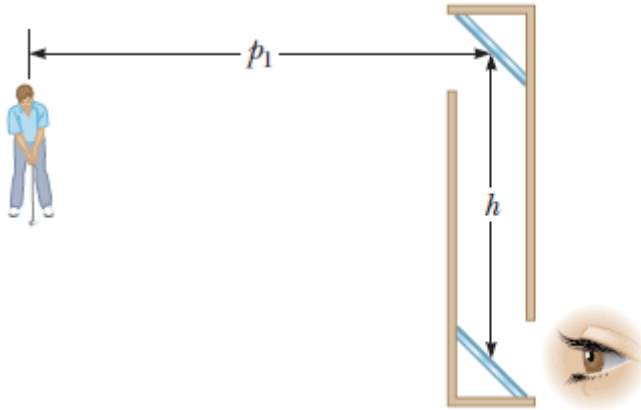
(a) What is the distance of the final image from the lower mirror? (Use any variable or symbol stated above as necessary.)

$d =$

behind the lower mirror

(b) Is the final image real or virtual?
  ○ real
  ○ virtual

(c) Is it upright or inverted?
  ○ upright
  ○ inverted

(d) What is its magnification?

(e) Does it appear to be left–right reversed?

○ Yes

○ No

Need Help? [Read It]

○ Yes

○ No

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2. [–/15 Points] | DETAILS | SERPSE10 35.2.OP.004.MI.

| MY NOTES | ASK YOUR TEACHER | PRACTICE ANOTHER |

A concave spherical mirror has a radius of curvature of magnitude 21.0 cm.

(a) Find the location of the image for the following object distances. (If there is no image formed enter "NONE".)

object distance (cm)	image distance (cm)	location
39.4		---Select---
21.0		---Select---
10.5		---Select---

(b) For each case, state whether the image is real or virtual.

object distance (cm)	real/virtual
39.4	---Select---
21.0	---Select---
10.5	---Select---

(c) For each case, state whether the image is upright or inverted.

object distance (cm)	real/virtual
39.4	---Select---
21.0	---Select---
10.5	---Select---

(d) Find the magnification in each case. (If there is no image formed enter "NONE".)

object distance (cm)	magnification
39.4	
21.0	
10.5	

Need Help? Read It   Master It

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3. [–/6 Points]   DETAILS   **SERPSE10 35.2.OP.005.MI.**

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

A convex spherical mirror has a radius of curvature of magnitude 46.0 cm.

(a) Determine the position of the virtual image and the magnification for object distances of 37.0 cm. Indicate the location of the image with the sign of your answer.

image location = ⬚ cm

magnification = ⬚

(b) Determine the position of the virtual image and the magnification for object distances of 53.0 cm. Indicate the location of the image with the sign of your answer.

image location = ⬚ cm

magnification = ⬚

(c) Are the images in parts (a) and (b) upright or inverted?
The image in part (a) is ---Select--- ▾
The image in part (b) is ---Select--- ▾

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4. [–/3 Points]   DETAILS   SERPSE10 35.4.P.023.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

An object located 35.0 cm in front of a lens forms an image on a screen 7.40 cm behind the lens.

(a) Find the focal length of the lens.

[   ] cm

(b) Determine the magnification.

[   ] ×

(c) Is the lens converging or diverging?

○ diverging

○ converging

Need Help? [Read It]

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5. [–/1 Points]   DETAILS   SERPSE10 35.4.OP.024.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

The image of the coin in the figure is magnified by a factor of $M = 2.3$ times, and is a distance $d = 4.0$ cm from the lens. What is the focal length (in cm) of the lens?

[   ] cm

Need Help? [Read It]

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6. [–/2 Points]   DETAILS   **SERPSE10 35.4.OP.022.**

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

The projection lens in a certain slide projector is a single thin lens. A slide 25.0 mm high is to be projected so that its image fills a screen 1.85 m high. The slide-to-screen distance is 3.06 m.

(a) Determine the focal length of the projection lens.

[   ] mm

(b) How far from the slide should the lens of the projector be placed to form the image on the screen?

[   ] mm

Need Help? [Read It] [Watch It]

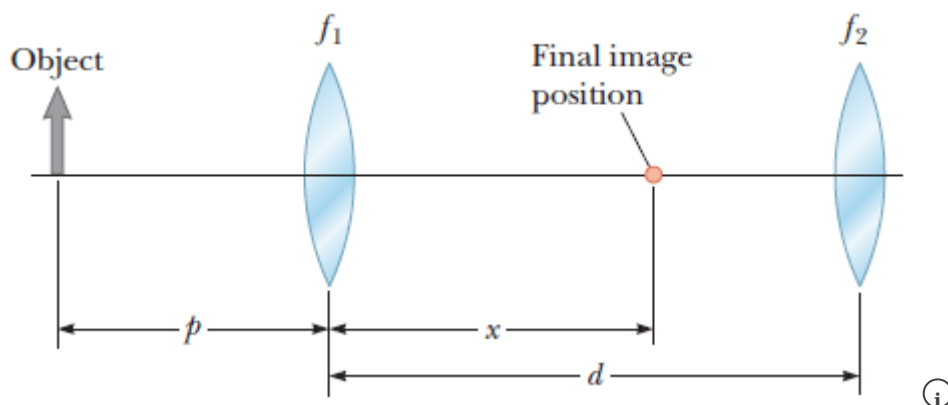7. **[–/4 Points]**   DETAILS   SERPSE10 35.A.P.048.

MY NOTES   ASK YOUR TEACHER   PRACTICE ANOTHER

Two converging lenses having focal lengths of f_1 = 12.5 cm and f_2 = 18.0 cm are placed a distance d = 49.5 cm apart as shown in the figure below. The image due to light passing through both lenses is to be located between the lenses at the position x = 33.0 cm indicated.

(a) At what value of p should the object be positioned to the left of the first lens?

[   ] cm

(b) What is the magnification of the final image?

[   ]

(c) Is the final image upright or inverted?
   ○ inverted
   ○ upright

(d) Is the final image real or virtual?
   ○ real
   ○ virtual

Need Help? [Read It]

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