

Section 1a

Quiz 2

22 February 2013

Closed book. No calculators are to be used for this quiz.

Quiz duration: 10 minutes

Name:

Student ID:

Signature:

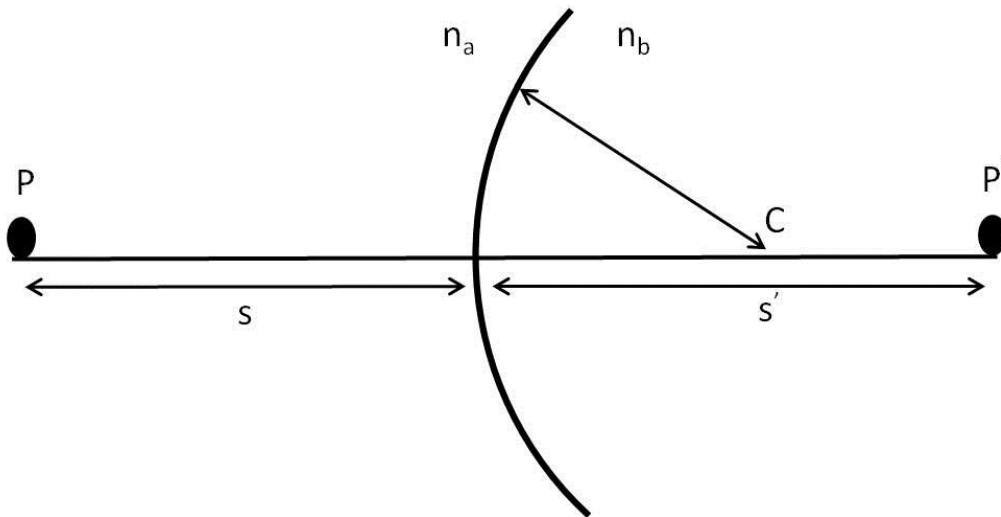
Find the ray transformation matrix for a thin lens of focal length f .

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Suppose that you have a point object located at a point P. The image of this object formed by a spherical refractive interface is P'. Show that the object-image relationship for a spherical refracting surface with center of curvature C and with radius R is given by the following relation. ($n_a < n_b$)

$$\frac{n_a}{s} + \frac{n_b}{s'} = \frac{n_b - n_a}{R}$$

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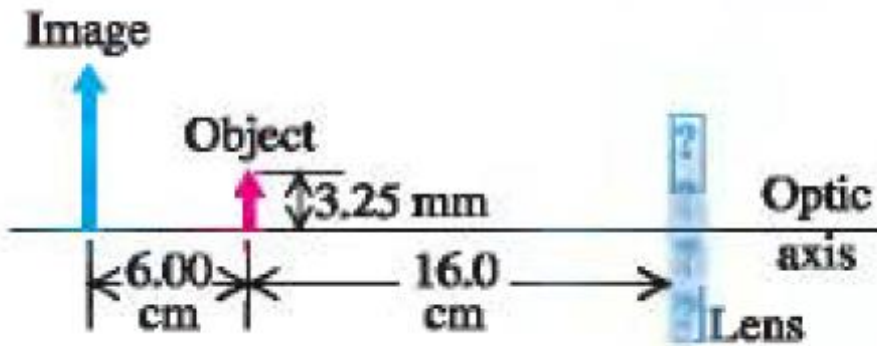
Name:

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The following figure shows an object and image formed by a thin lens.

- What is the focal length and what type of lens (converging or diverging) is it?
- What is the height of the image? Is it real or virtual?

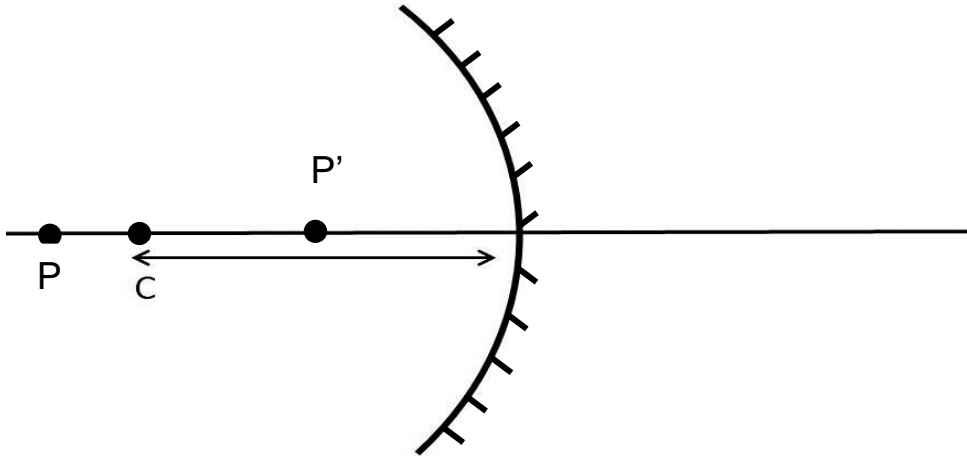


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Consider a concave (converging) mirror with radius R and a center of curvature C . Consider the point object P located at a distance s from the vertex. The image of the point object forms at P' at a distance s' from the vertex. Find the relation between s and s' using geometric derivations on the figure above.

PHYS 206:

KOÇ UNIVERSITY
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Spring Semester 2013

Section 1e

Quiz 2

22 February 2013

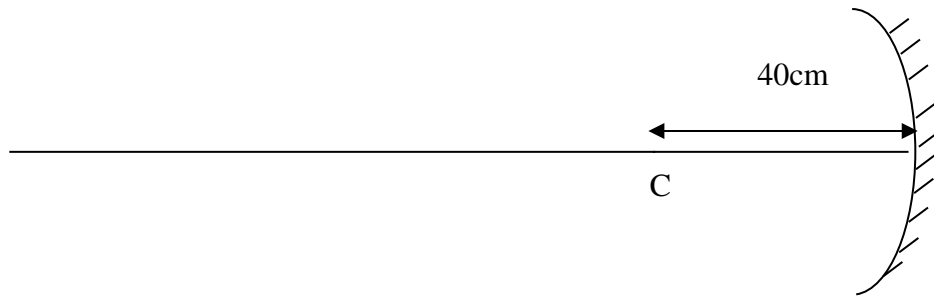
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There is an object with 2 cm height. The image of the object form by a converging (concave) mirror with $R=40$ cm is inverted and has 1 cm height. Find the distance of the object and image from the vertex of the mirror.



PHYS206: General Physics IV KOÇ UNIVERSITY
College of Arts and Sciences

Spring Semester 2013

Section 1f

Quiz 2

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Quiz duration: 10 minutes

Name:

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Signature:

Find the ray transformation matrix corresponding to free space propagation by a distance d .