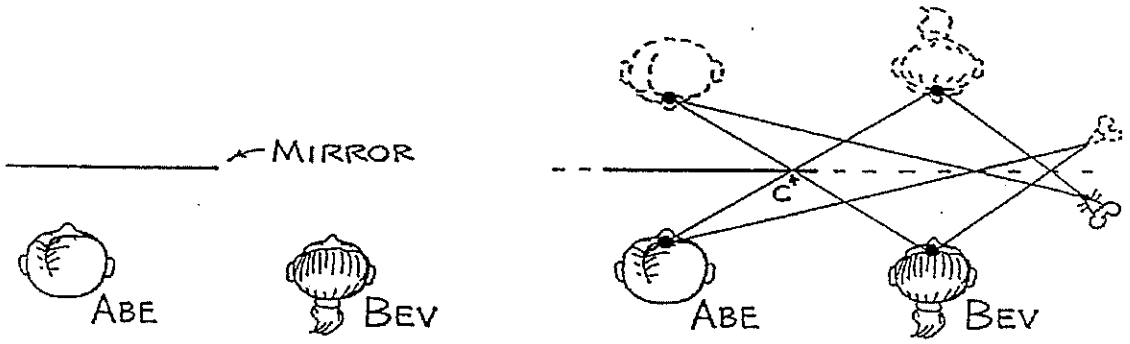
Name _____ Date _____

CONCEPTUAL Physics PRACTICE PAGE

Chapter 28 Reflection and Refraction

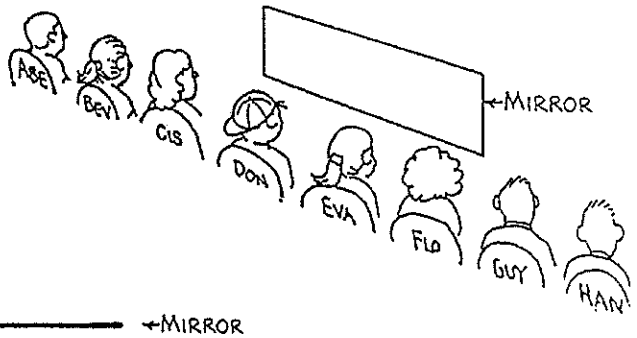
Reflection



Abe and Bev both look in a plane mirror directly in front of Abe (top left view). Abe can see himself while Bev cannot see herself—but can Abe see Bev, and can Bev see Abe?

To show the answer, we construct their artificial locations "through" the mirror, the same distance behind as Abe and Bev are in front (top right view). If straight-line connections intersect the mirror, as at point C, then each sees the other. The mouse, for example, cannot see or be seen by Abe and Bev (because there's no mirror in its line of sight).

Here we have eight students in front of a small plane mirror. Their positions are shown in the diagram below. Make appropriate straight-line constructions to answer the following:



ABE BEV CIS DON EVA FLO GUY HAN

Abe can see _____

Bev can see _____

Cis can see _____

Don can see _____

Eva can see _____

Flo can see _____

Guy can see _____

Han can see _____

Abe cannot see _____

Bev cannot see _____

Cis cannot see _____

Don cannot see _____

Eva cannot see _____

Flo cannot see _____

Guy cannot see _____

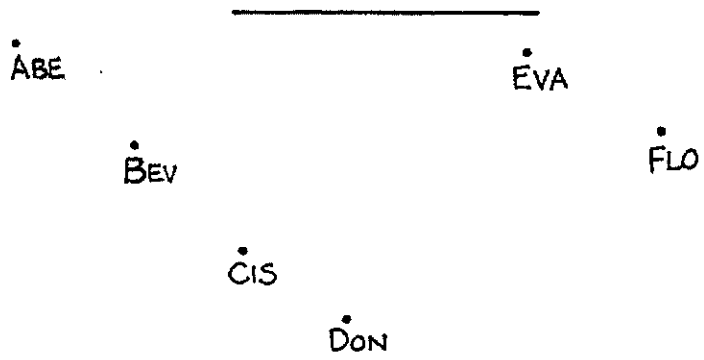
Han cannot see _____

thanx to Marshall Ellenstein

Chapter 28 Reflection and Refraction

***Reflection**—continued*

Six of our group are now arranged differently in front of the same plane mirror. Their positions are shown below. Make appropriate constructions for this interesting arrangement and answer the questions below.



Who can Abe see? _____ Who can Abe not see? _____

Who can Bev see? _____ Who can Bev not see? _____

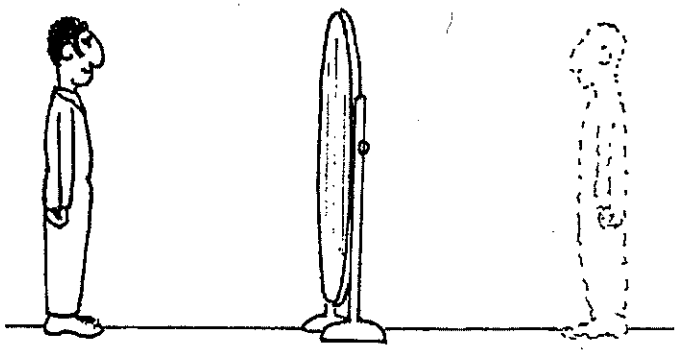
Who can Cis see? _____ Who can Cis not see? _____

Who can Don see? _____ Who can Don not see? _____

Who can Eva see? _____ Who can Eva not see? _____

Who can Flo see? _____ Who can Flo not see? _____

Harry Hotshot views himself in a full-length mirror (right). Construct straight lines from Harry's eyes to the image of his feet and to the top of his head. Mark the mirror to indicate the minimum area Harry uses to see a full view of himself.



Does this region of the mirror depend on Harry's distance from the mirror? _____

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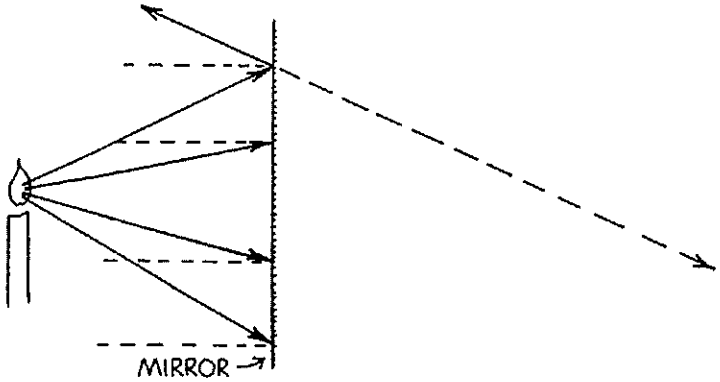
Reflected Views

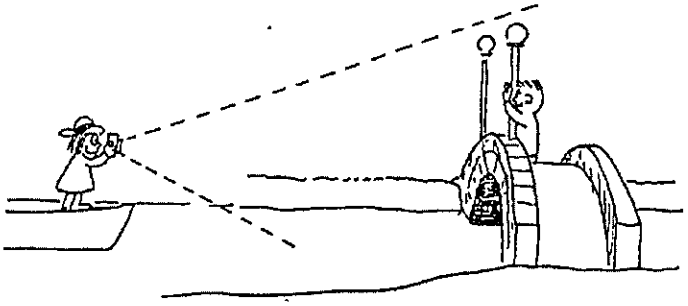
1. The ray diagram below shows the extension of one of the reflected rays from the plane mirror. Complete the diagram by

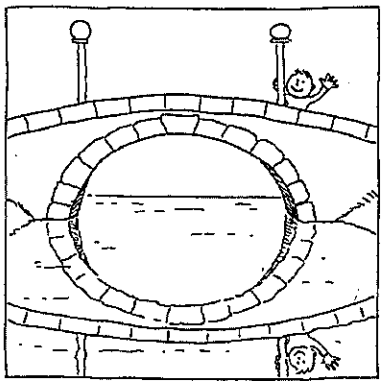
   a. carefully drawing the three other reflected rays.

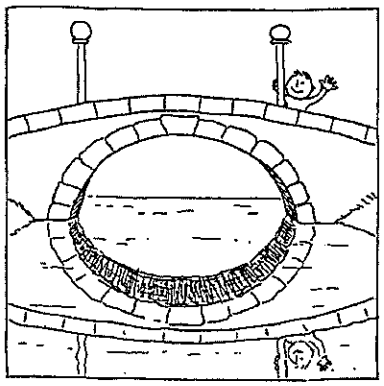
   b. extending them behind the mirror to locate the image of the flame. (Assume the candle and image are viewed by an observer on the left.)



2. A girl takes a photograph of the bridge as shown. Which of the two sketches below correctly shows the reflected view of the bridge? Defend your answer.



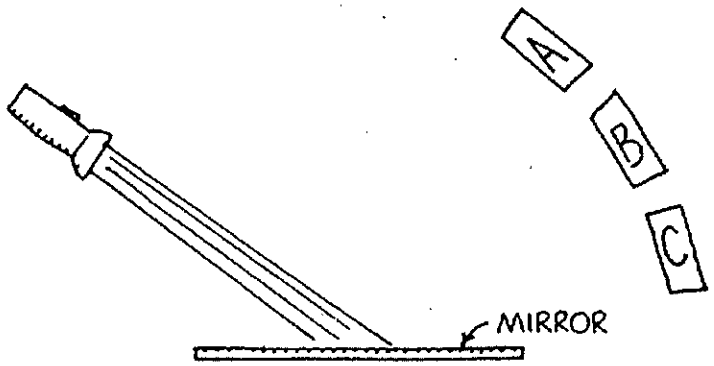




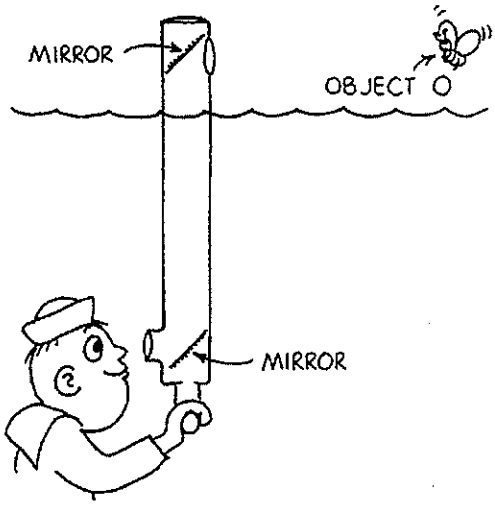
Chapter 28 Reflection and Refraction

More Reflection

1. Light from a flashlight shines on a mirror and illuminates one of the cards. Draw the reflected beam to indicate the illuminated card.



2. A periscope has a pair of mirrors in it. Draw the light path from the object "O" to the eye of the observer.



3. The ray diagram below shows the reflection of one of the rays that strikes the parabolic mirror. Notice that the law of reflection is obeyed and the angle of incidence (from the normal, the dashed line) equals the angle of reflection (from the normal).
Complete the diagram by drawing the reflected rays of the other three rays that are shown.
(Do you see why parabolic mirrors are used in automobile headlights?)