

GEOMETRIC OPTICS DAY 2: LAB L13.1: PLANE-MIRROR IMAGE LOCATION

CED 13.1 · Skills 3.A/1.A · FRQ: ED · guided investigation

RETRIEVAL

A pin is 24 cm in front of a plane mirror. Predict the signed image distance and the positive distance behind the mirror.

QUESTION AND SAFETY

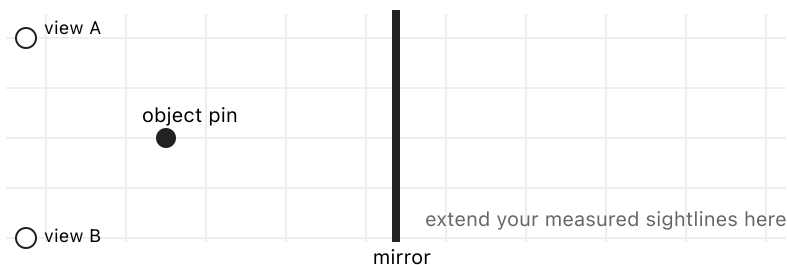
Question: Where do sightlines place a plane-mirror image, and how does its distance compare with the object distance?

Safety: Push pins only into the cork board. If a laser is used, keep the beam below eye level and terminate it on the paper or a matte stop.

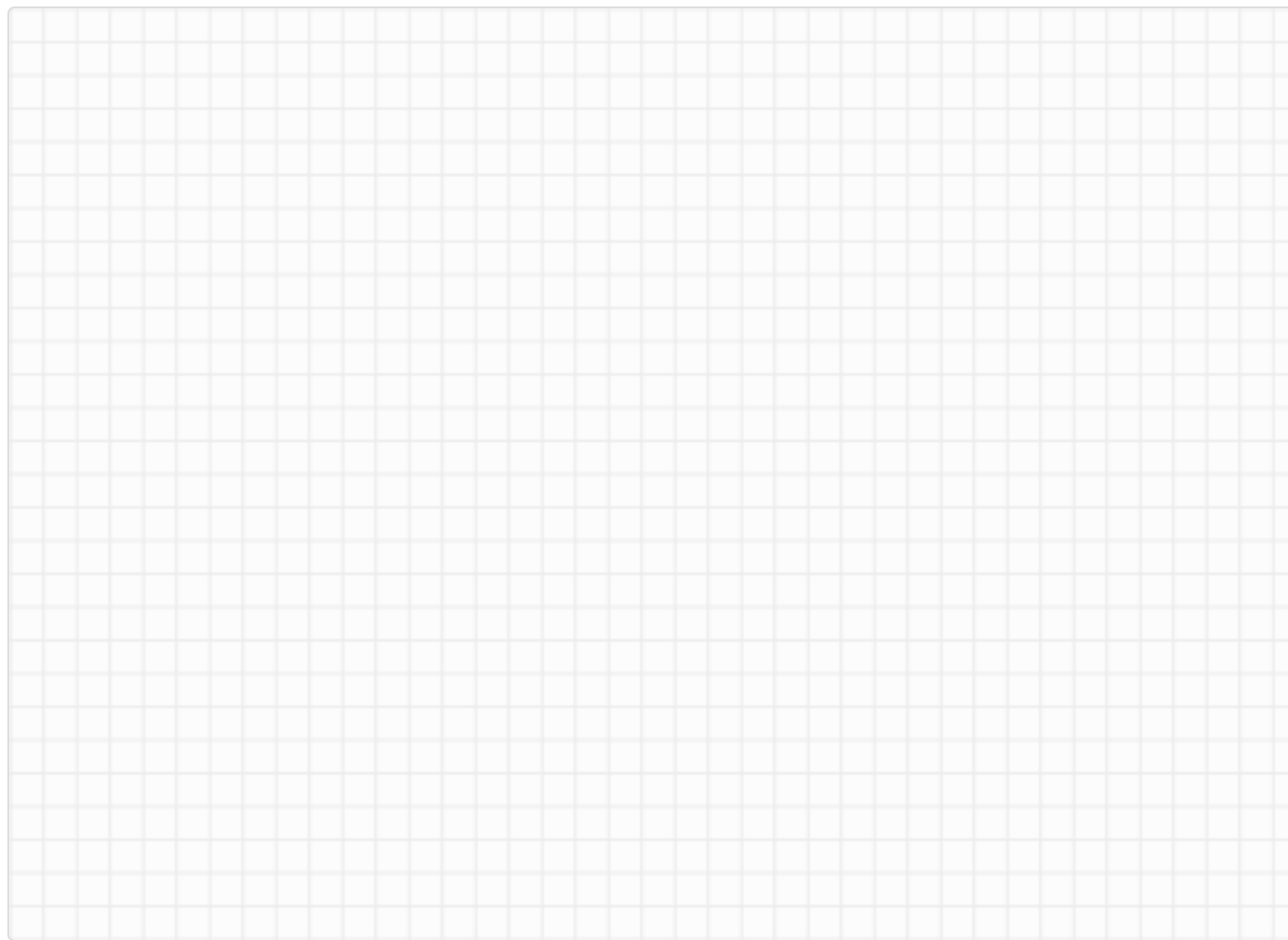
SETUP

1. Trace the mirror line and mark the object-pin position.
2. From viewpoint A, align two pins with the image and draw that sightline.
3. Repeat from a well-separated viewpoint B.
4. Remove the mirror before extending either line behind it.

NOTES / REASONING

SIGHTLINE RECORD**CONSTRUCTION GRID - IMAGE NOT MARKED**

Measured construction: draw both sightlines as solid lines to the mirror. Extend each behind the mirror with a dashed ruler line. Mark their intersection as the image.



Use two viewpoints separated enough that the lines meet at a clear angle. Nearly parallel sightlines make the intersection uncertain.

DISTANCE DATA

trial	d_o in front (cm)	measured $ d_i $ behind (cm)	$ d_i - d_o$ (cm)
1			
2			
3			
4			

Analysis 1: Plot or compare $|d_i|$ with d_o . State the relationship supported by your data.

Analysis 2: Use the spread in repeated intersection locations to estimate an uncertainty in $|d_i|$.

CLAIM, EVIDENCE, AND METHOD CHECK

1. Claim: state the signed plane-mirror relationship between d_i and d_o .

2. Evidence: cite two trials and their uncertainties.

3. Method: explain why one sightline is insufficient to locate the image point.

4. Error analysis: predict how using two nearly parallel sightlines affects the uncertainty of their intersection.