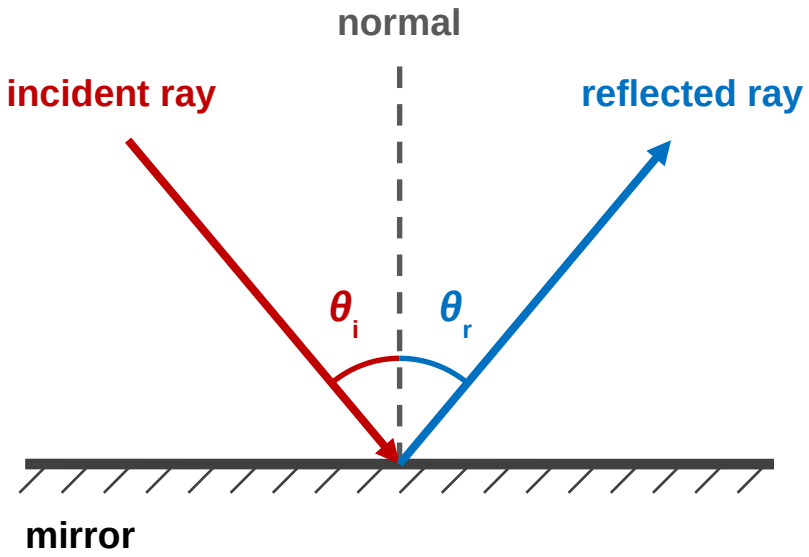
Essential Question

Why do you see yourself in a mirror?

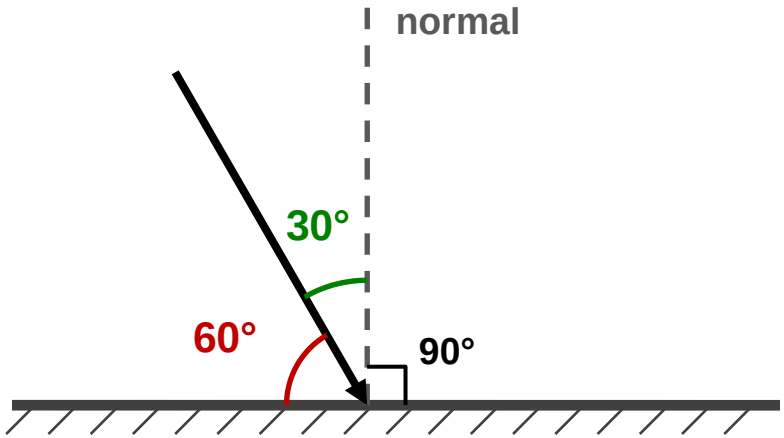
The Law of Reflection

- Angle in = angle out
- $\theta_i = \theta_r$
- Both measured from the normal



The Normal Line

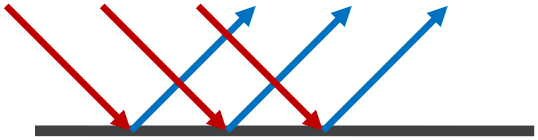
- Line at 90° to the surface
- Draw it dashed
- Measure from it, not the mirror



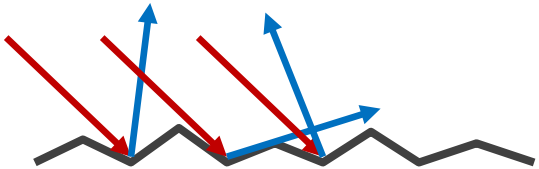
measure from the normal, not the mirror

Specular vs. Diffuse Reflection

- Smooth surface: rays stay parallel
- Rough surface: rays scatter
- Mirror vs. paper



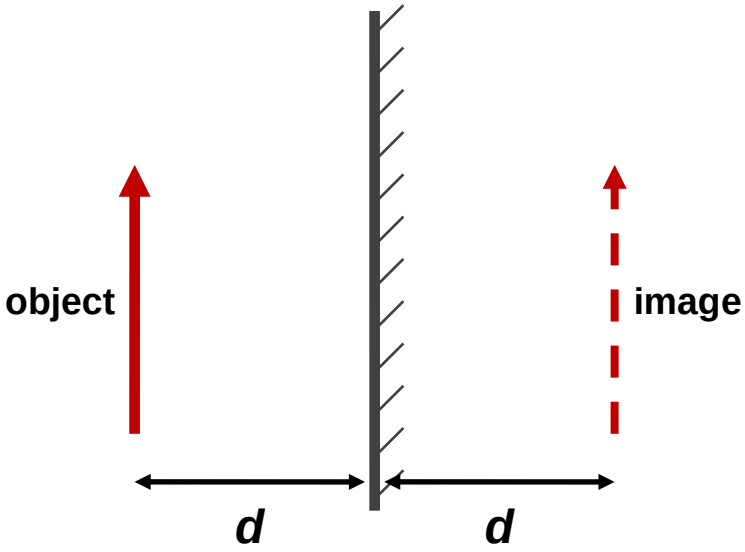
specular (smooth)



diffuse (rough)

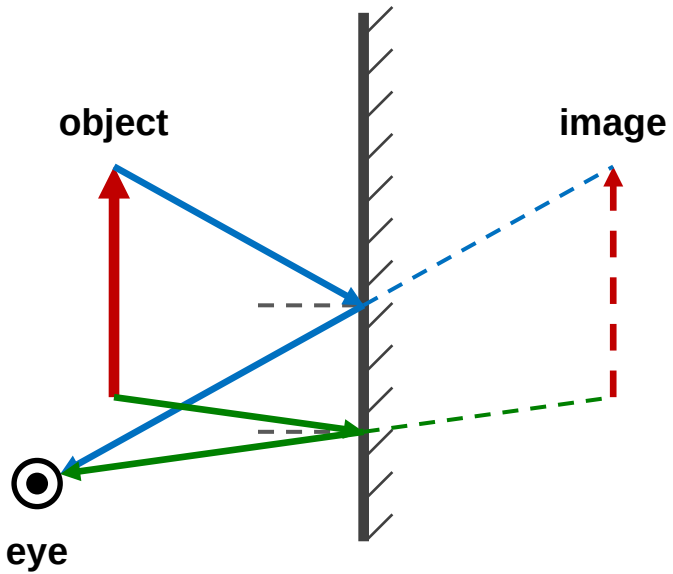
Images in a Plane Mirror

- Image appears behind the mirror
- Same size, same distance
- Virtual: no light really goes there



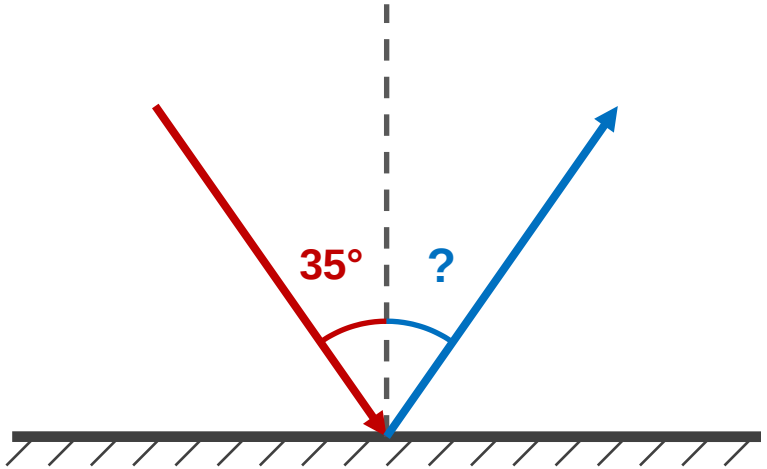
Ray Diagram: Plane Mirror

- Rays leave the object
- Reflect: $\theta_i = \theta_r$
- Extend reflected rays back, dashed
- They meet at the image



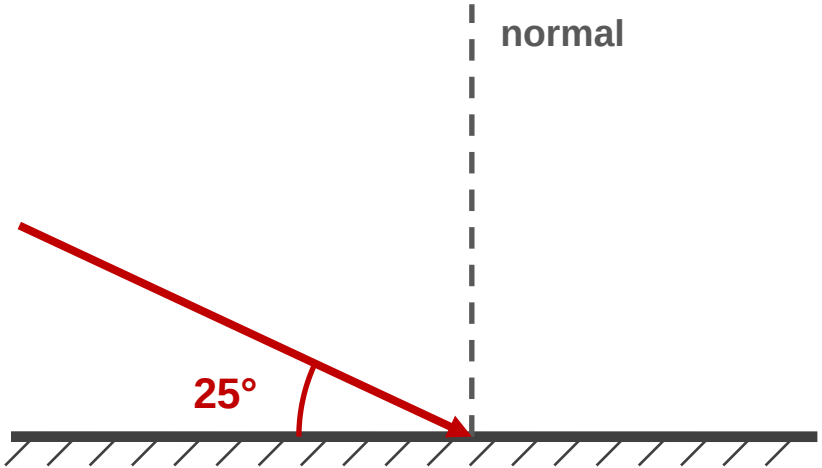
Example: Angle of Reflection

A light ray strikes a plane mirror at an angle of 35° from the normal. What is the angle of reflection?



Example: Angle from the Surface

A ray of light makes a 25° angle with the surface of a mirror. Find the angle of incidence and the angle of reflection.

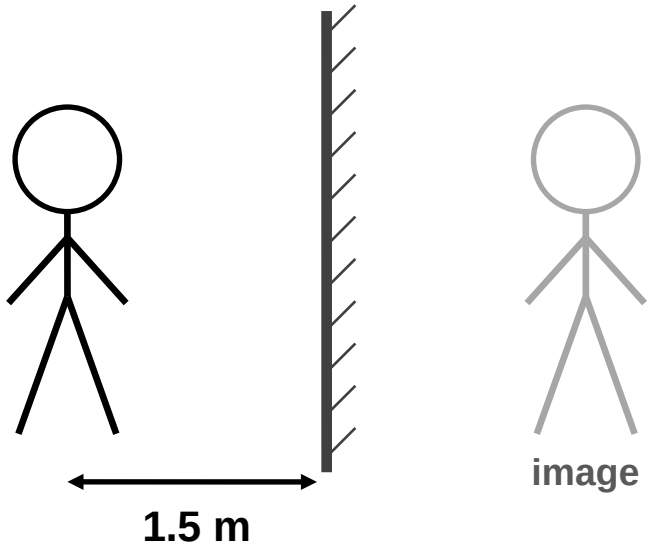


Example: Angle Between Rays

A ray hits a mirror with an angle of incidence of 28°. What is the angle between the incident ray and the reflected ray?

Example: Image Distance

You stand 1.5 m in front of a plane mirror. How far are you from your image?



Reflection and Mirrors

Big Ideas

- $\theta_i = \theta_r$, measured from the normal
- Smooth: specular. Rough: diffuse
- Plane mirror image: same size, same distance
- Image is virtual, behind the mirror