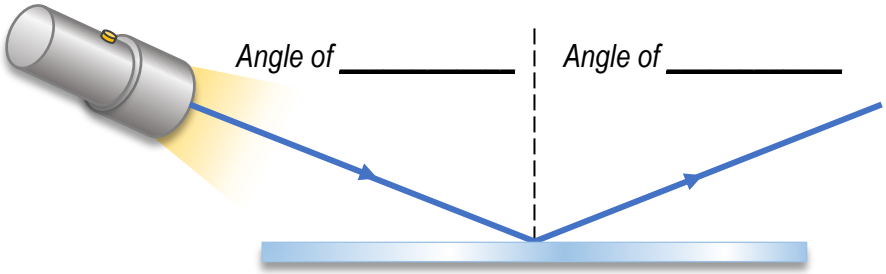
CONCEPT: LIGHT RAYS & THE LAW OF REFLECTION

● Geometric Optics: **Light** travels in a _____ as a **ray,** even though it is made up of waves.



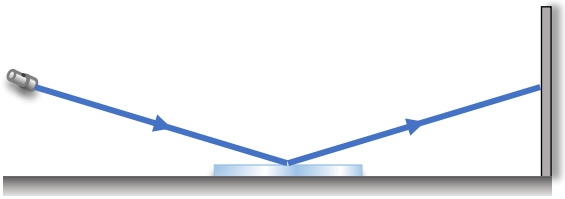
_____ = _____

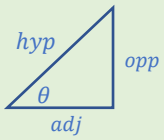
(Law of Reflection)

● When light rays hit a flat, shiny surface (e.g. mirror) at an angle (incidence), they ***reflect*** at the _____ angle (reflection).

- Angles are ALWAYS measured relative to the _____, a line perpendicular to the surface.

EXAMPLE: You shine a laser at a flat mirror on the ground. If you want the laser beam to hit the midpoint of the wall, which is 4 meters away from where the laser hits the mirror and 2 meters tall, what should the angle of incidence be?

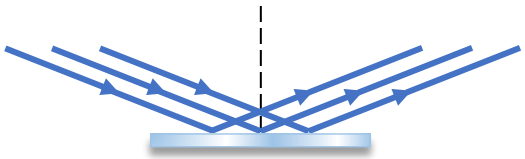


TRIG EQs	
$\sin\theta = \frac{Opp}{Hyp}$ $\cos\theta = \frac{Adj}{Hyp}$ $\tan\theta = \frac{Opp}{Adj}$	

● Problems will ***always*** involve Specular Reflection from smooth surfaces, not Diffuse Reflection from rough surfaces.

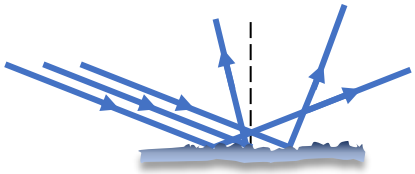
SPECULAR REFLECTION

(Smooth surface)

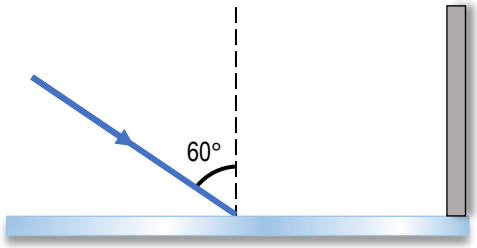


DIFFUSE REFLECTION

(Rough surface)



PROBLEM: A light ray strikes a horizontal surface at a 60° angle. The reflected ray then strikes a wall 2.5m above the reflective surface. How far is the wall from the point where the incident light ray strikes the surface?



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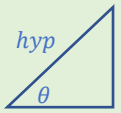
$\sin\theta = \frac{Opp}{Hyp}$ $\cos\theta = \frac{Adj}{Hyp}$ $\tan\theta = \frac{Opp}{Adj}$	

OPTICS EQUATIONS
$\theta_1 = \theta_1'$