

Assignment: Laser Light Security System

Introduction

A local museum is displaying a number of priceless artifacts in two adjoining rooms that are connected by an open door and are staggered in their structure. Security is provided by a laser light and light sensor combination. The laser light must enter one of the rooms from whichever direction you choose, through a small opening in the side of the room. It must bounce off all the windows and the outside doors. Finally, it must hit a 2cm x 2cm piece of paper attached to the wall of the last room that represents the alarm sensor.

Problem

How can you set up a security system using the laser and the light sensor?

Task

Using the **Law of Reflection**, you will design an effective laser security system that meets these requirements:

- Location of where the laser light will be mounted from
- Must bounce off all the windows or pass within 2cm of the center of the window
- Must bounce off all the outside doors or pass within 2cm of the center of the door
- Must hit a 2cm x 2cm piece of paper attached to the wall of the last room
- Use the least number of plane mirrors as possible
- Label the incident ray, incident angle, reflected ray and reflected angle for each of the mirrors the laser will hit
- Include a small written summary of how your security system works
- Include **one** item you like about your security system and **two** items that you could improve on your security system

Marking Scheme

Level Criteria	R	Level 1	Level 2	Level 3	Level 4
Adheres to checklist requirements listed above under "Task"	Includes none of the requirements listed above (0 requirements)	Includes few of the requirements listed above (1-2 requirements)	Includes some of the requirements listed above (3-4 requirements)	Includes most of the requirements listed above (5-6 requirements)	Includes all requirements listed above (7-8 requirements)