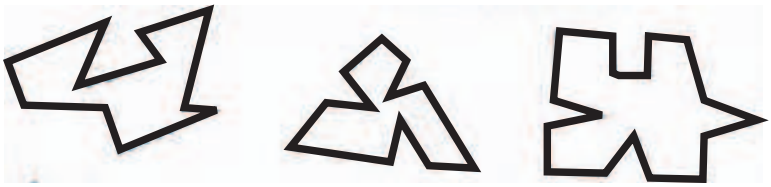
Playsheet 6
To Catch a Thief

MATH 130-02
Tuesday, February 17, 2009

Directions: Groups should consist of three or four people. Work together on each problem; do not delegate different problems to different people. Submit one **neatly written** write-up per group. Remember to use complete sentences as appropriate and explain your reasoning. That is, **show your work!**

Suppose we have an art gallery consisting of a single room with straight walls. Imagine we're looking down on the gallery from above, like a floor plan. The walls might be arranged in a crazy way, like the examples shown below, but always in a single closed loop. We place video cameras at some of the corners of the gallery. The cameras need to see every spot in the interior of the gallery, to catch thieves stealing paintings or sculptures.



1. How many cameras do we need to guard the art galleries shown above?

2. How many cameras might we need to guard any art gallery with 6 walls? (Try a few.)

3. How many cameras might we need to guard any art gallery with n walls? (Consider different numbers of walls, and look for a pattern.)

4. What if the walls only meet at 90° angles?

5. What if some of the walls have mirrors on them, so that the cameras can see a thief reflected through them?