

Ans): Using observation in Prob 2, it will take us an even no. of moves to go from a1 to h8 in any possible path we choose to follow.

- Suppose we go from a1 to h8 by moving through each of the other squares exactly once on the way. In that case, it will take us $62+1=63$ moves, which is odd.

\therefore Such a path is impossible.

Prob 12: Can a convex 13-gon be divided into parallelograms?

Ans): ~~From the net~~ **Key Observation:** After watching some convex polygons from the net, we notice each of them have maximum 2 mutually parallel straight lines. There are no 3 mutually parallel straight lines. (Due to lack of geometry skills, I can't prove it rigorously for now)

\therefore In a convex 13-gon, one line segment exists which is not parallel to the rest of the 12 segments.

So, we can't divide the 13-gon into \parallel gms.



• Problems 10 and 11 concern a set of dominoes consisting of 2×1 rectangles with 0 to 6 spots on each square. All 28 possible pairs of numbers of spots (including doubles) are represented. The game is played by forming a chain in which squares of adjacent dominoes have equal number of spots.

Problem 10: All the dominoes in a set are laid out in a chain (so that the number of spots on the ends of adjacent dominoes match). If one end of the chain is a 5, what is at the other end?

Ans) (5,0) (5,1) (5,2) (5,3) (5,4) (5,5) (5,6) ~~(5,7) (5,8)~~

• There are 8 5's. From the given constraint, since the 5's in between must occur together in pairs, there can be at most 3 such pairs. So, there is a 5 at other end.