

HOMWORK 7

1. A problem at a party

You are at a mathematical party. Each person exchanges introductions with everyone else at the party.

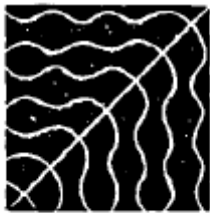
Some clarifying points:

- We will count each pair of exchanges as one introduction. So, for example, if Arup introduces himself to Nicole and Nicole introduces herself to Arup, that is one introduction. In other words, each pair of party-goers exchanges introductions just once.
- None of the party goers knows anyone else in the room upon entering the party
- No one re-introduces him/herself to someone they've already met

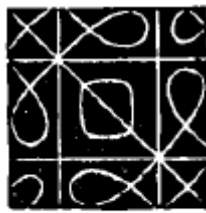
How many introduction will there be if 5 people attend the party? How about for 11 people? n ?

What principle(s) discussed in class does this problem relate to? There are many—make as many connections as you can.

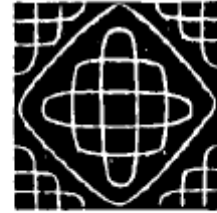
2. Patterns in the Chladni Plate.



(a)



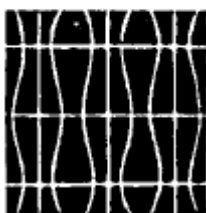
(b)



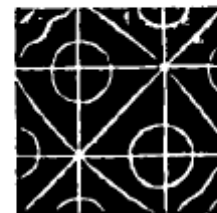
(c)



(d)



(e)



(f)

The picture above shows a variety of Chladni plate patterns like the ones you worked on last week in class. Describe the symmetries in these patterns in detail. Try to use the language about symmetries discussed in class. Be specific and explain your thoughts in complete and elaborate sentences.