

# Fun with Graphs

## Problem # 1

I invited three married couples to my home for dinner. Upon arrival, my 6 guests and I shake hands with some of the others. No person shakes hands with his/her spouse. Suppose I know that each of my 6 guests shakes hands with a different number of people (possibly none).

Describe a graph model, what are the nodes and edges of your graph?

Using your graph model, figure out how many hands I must have shaken.

Now suppose that I invited  $k$  married couples, and again we shake hands, no person shakes hands with his/her spouse, and each of my  $2k$  guests shakes hands with a different number of people (possibly none). How many hands do I shake?