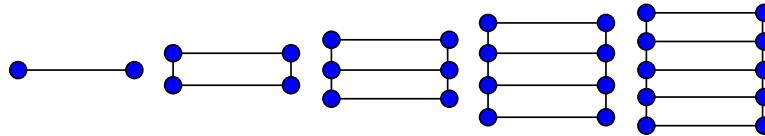


## Homework 3: Edge Coloring

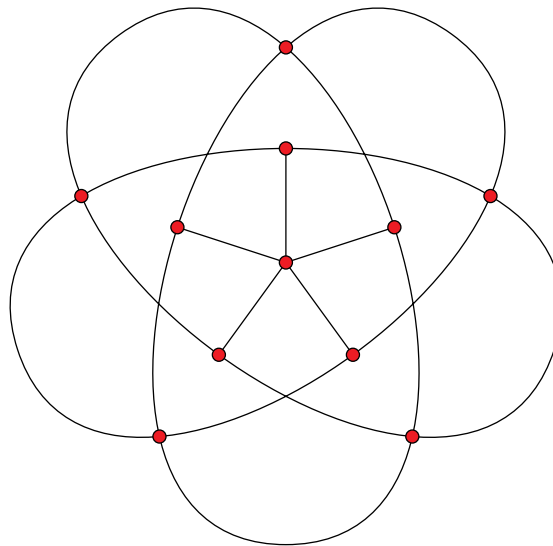
Week 2

Mathcamp 2010

- Find an explicit edge-coloring of  $K_{n,n}$  that uses no more than  $n$  colors.
- Draw the line graph of  $K_5$ , and take the complement of this graph. What is this graph?
- Find the edge-chromatic number of the following graphs:
  - $K_n$ .
  - The ladder graph  $L_n$  (depicted below; from last HW!)



- The Petersen graph.
- The Grötzsch graph (depicted below.)



- Suppose that the three-regular graph  $G$  has exactly one edge coloring with  $\chi'(G)$  many colorings, up to a permutation of our colors. Show that  $\chi'(G) = 3$ .