MG 5860: Visual Group Theory (Summer 2009)
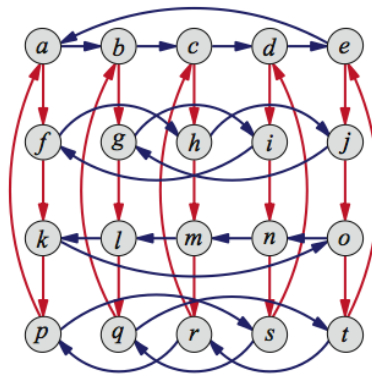## Quiz 8 (20 points)

NAME:

Instructions: Answer each of the following questions completely. If something is unclear, or if you have any questions, then please ask. Good luck!

1. (4 points) Let H be a subgroup of a group G. Define: left cosets of H.

2. (4 points) Consider the group C_8. Find *all* left cosets of the subgroup $H = \langle 4 \rangle$ in C_8 by listing the elements in each coset.

3. (4 points) Consider the following Cayley diagram for a group G. Assume that the element a is the identity. Also, all arrows running north-south are of one type (f) and all arrows running east-west are another type (b).

Taken from page 89 of *Visual Group Theory*

   Find *all* left cosets of the subgroup $\{a, f, k, p\}$ by listing the elements in each coset.

4. (4 points) State Lagrange's Theorem.

5. (4 points) Consider the symmetric group S_4. What are the possible orders of subgroups?