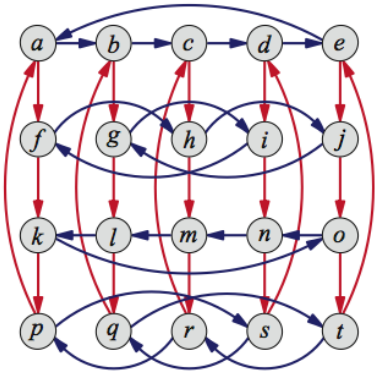
MG 5860: Visual Group Theory (Summer 2009)
Quiz 10 (20 points)

NAME:

Instructions: Answer each of the following questions completely. If something is unclear, or if you have any questions, then please ask. Good luck!
For each of the following H and G with $H < G$, attempt the quotient process from Definition 7.5 to determine whether G/H is a group. If the process succeeds (i.e., G/H is a group), then draw its Cayley diagram and be sure to label its nodes appropriately. If the process fails, then explain why G/H is not a group.

1. (10 points) Let $G = Q_4$ and $H = \langle i \rangle$ (feel free to look at the Cayley diagram of Q_4 on page 53 of VGT).

2. (10 points) Let G be the give by the following Cayley diagram and let $H = \{a, f, k, p\}$. 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*