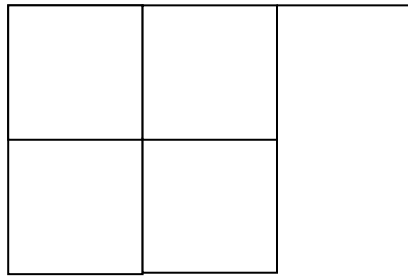


MAT 375-1
HOMEWORK ASG. #1 **HAND IN TUESDAY, SEPTEMBER 6**

For each problem, show your work neatly on a separate sheet of paper.

1. For this city street map



find the minimum number of police, stationed on corners, required for:

- a) street surveillance (edge cover).
- b) corner surveillance (vertex cover).

For each part, be sure to do two things:

- 1) find the theoretical minimum—give an argument why at least a certain number is required, and
- 2) show how to do it with that number of police.

2. Persons A, B, C and D have applied to a company that has jobs a, b, c and d open. All four are qualified for job d and A is qualified for every job. In addition, B and C are qualified for job a. Does there exist a “job matching?” That is, can all four jobs be filled by these four people? Explain.
3. Exercise Set 1.1, Problem #4.
4. Exercise Set 1.2, Problem #2 (This means make a list of directed graphs. Each one must have three vertices, but there is no restriction on the number of edges. No two graphs in the list can be isomorphic, and every directed graph with three vertices must be isomorphic to one of the graphs in your list.)
5. Exercise Set 1.2, Problems #6a, 6b, 6c, 6e.