This is an example of how to write up a homework problem in Math 381. Text in red is commentary, and not part of what you should write.
Suppose the homework problem is the following:
1. Let G be the graph on seven vertices with adjacency matrix A defined by

$$A_{ij} = 1 \text{ iff } \cos(i+3j) > 0.$$

Determine whether or not G is connected.
The key things are to make sure that your answer clearly shows what the problem is, and defines all objects needed for the problem.
Your answer could look like this:
1. We want to determine whether or not the graph G is connected, where G has adjacency matrix defined by

$$A_{ij} = 1 \text{ iff } \cos(i+3j) > 0, 0 \leq i, j \leq 7.$$

Using PARI/GP, we can generate A like this:
It is helpful to set code apart so that it is distinct from the rest of your writing. Here, I used horizontal rules, and the LaTeX package *listings* to give the code a different look.

```
A=matrix(7,7);\
for(i=1,7,for(j=i+1,7,if(cos(i+3*j)>0,A[i,j]=1;A[j,i]=1)))
```

The result is the matrix A:

$$A = \begin{pmatrix} 0 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 & 1 \\ 1 & 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 & 0 \end{pmatrix}$$

The ij-th entry of A^k, where k is a positive integer, indicates the number of walks of length k from vertex i to vertex j.
In particular, the ij-th entry of A^k will be nonzero if and only if there is a path of length k from vertex i to vertex j.
Looking at various A^k, we found that, with $k = 3$, we got:
We want to use fact that A^3 has no zero entries, so we should *show* A^3 to convince the reader of this fact.

$$A^3 = \begin{pmatrix} 4 & 6 & 4 & 7 & 3 & 5 & 3 \\ 6 & 4 & 8 & 10 & 3 & 6 & 3 \\ 4 & 8 & 2 & 3 & 7 & 1 & 7 \\ 7 & 10 & 3 & 4 & 8 & 2 & 8 \\ 3 & 3 & 7 & 8 & 4 & 3 & 5 \\ 5 & 6 & 1 & 2 & 3 & 2 & 3 \\ 3 & 3 & 7 & 8 & 5 & 3 & 4 \end{pmatrix}$$

Since all entries of A^3 are non-zero, there exists a walk of length 3 between every pair of vertices.
Be sure to answer precisely the question that was asked.
Since there is a walk between every pair of vertices, G is connected.