

Math 38
Spring 2016

Written Homework due Wednesday, March 30

Part 1: Complete the questionnaire. If you print it out from the Documents page, please print on one side only. I may want to separate pages 1 and 2 in my records.

Part 2: Create three graphs, each of which models some relation.

Your three graphs should model relations in three different subjects or areas of application.

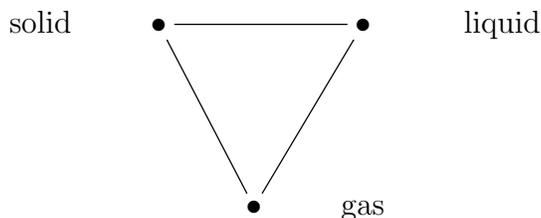
Your three graphs should have different structures. At least one of them should be bipartite, and model a relation that by its nature calls for a bipartite graph. For example, vertices could represent painters and styles of painting, with edges connecting painters and styles in which they worked.¹ Two of your graphs should be simple graphs. The third may also be a simple graph, or may be a multigraph or have loops, as you prefer.

Try to have as much variety as possible, both in the structural properties of your graphs and in the relations they model. Try to have fun with this assignment.

Present each graph via a picture with labeled vertices, and a verbal description of the relation modeled by the edges in the graph, as in the example below. Your labels should be specific, and should not be made up.² For example, a graph featuring painters and styles of painting must model a bit of actual art history.

Special instruction: You are always encouraged to work together on homework problems, as long as you write up solutions independently. For this problem, you may work together, but you may not use the same examples as each other. This means that three people who do all the work on this problem together must come up with nine different examples, which could be fun.

Example:



Edge relation: Vertices are connected if matter can change directly from one state to the other.

¹Don't use that example, because that's my idea not yours.

²At least not made up by you. One example from a fictional source, such as a bipartite graph whose vertices represent potions and ingredients in the world of Harry Potter, is allowed, as long as it accurately models information in the source. Don't use that example, because that's my idea. Besides, I'm not sure the books contain enough complete recipes, which you would need in order to be sure that a given potion does not contain a given ingredient.