

Using Matlab to Generate Direction Fields

Direction fields for first order equations can be easily generated using MATLAB along with a free .m file available at <http://math.rice.edu/~dfield/>. You will need to download the correct version of "dfield5.m" for the version of MATLAB that you are using, and put the file in the "Toolbox" folder in your MATLAB folder. While you're there, you might also download the file "pplane5.m" which we will be using when we study systems of differential equations.

The next step is to set the path so the program knows where to find the file. Start MATLAB, and from the menu bar, select Window / MATLAB Path. In the left hand box, find the file dfield5.m then hit the "append" button.

Now, in the MATLAB command window, type dfield5 at the prompt (no dot m), and a set-up window will appear. The differential equation (solved for the derivative term) goes in the first line - they're using x as the dependent variable and t as the independent, but you can change those to y and t or y and x if you wish. Specify the independent variable, and then choose max and min values for the two variables and hit "proceed." A display window should appear. Clicking on any point in the plane will produce a solution curve through that point. If you'd like to change the max and min values, go back to the set-up box, make the changes and "proceed."