AE 360
Homework 1
Due: Thursday, 16 January 1997, in class

1. Anderson, 1.1, p. 31

2. Anderson, 1.3, p. 31

3. Anderson, 1.6, p. 31

4. Math Review, 4, p. 10; (find under http://www.nd.edu/~powers/ae.360/documents.html) use the xmaple function "plot" to plot the pathline for the particle which commences at the origin $(0,0)$ for $0 < t < 2$. Also use the xmaple function "fieldplot" to plot the velocity vector field at $t = 1$, $0 < x < 1$, $0 < y < 1$.

5. Math Review, 5, p. 11; (find under http://www.nd.edu/~powers/ae.360/documents.html); use the xmaple function "fieldplot" to plot the velocity vector field for $-2 < x < 2$, $-2 < y < 2$.

The above problems should be primarily review from thermodynamics, incompressible aerodynamics, and mathematics. Be sure to follow the homework format specified in the course syllabus. Note that vector fields, the real meat of fluid mechanics, are plots in which at every location, a vector (eg velocity vector) is assigned and drawn. An example is found at

http://www.nd.edu/~powers/me.334/personnel.

Your plots must be computer generated; I've suggested using xmaple because it's really easy, but you could use matlab, mathematica, or xvgr, etc. as well. The application xmaple has a very nice help browser which is stuffed with examples, so there really should not be a problem. I believe to use "fieldplot", you need to initialize with the command "with(plots)". Clip all plots and tape them to your engineering paper. If you've any problems, be certain to stop by and speak with Andrey or myself!

J. M. Powers
12 January 1997