TK Solver Application Libraries

TK Solver is a non-procedural case solver with many useful features to support engineering design. Unlike procedural systems (C, C++, Fortran, Matlab, …) TK can have the unknown(s) on either side of the equals mark (=). Given an input set, TK determines which case will match the number of equations to the number of unknowns. Then it solves that system, using iterative methods if necessary.

TK also has several existing models in its Application Library. This is a brief summary of how to access that library. First pick the library icon (books in Figure 1) to see the main subject areas. Then double click an area name to see the sub-options.

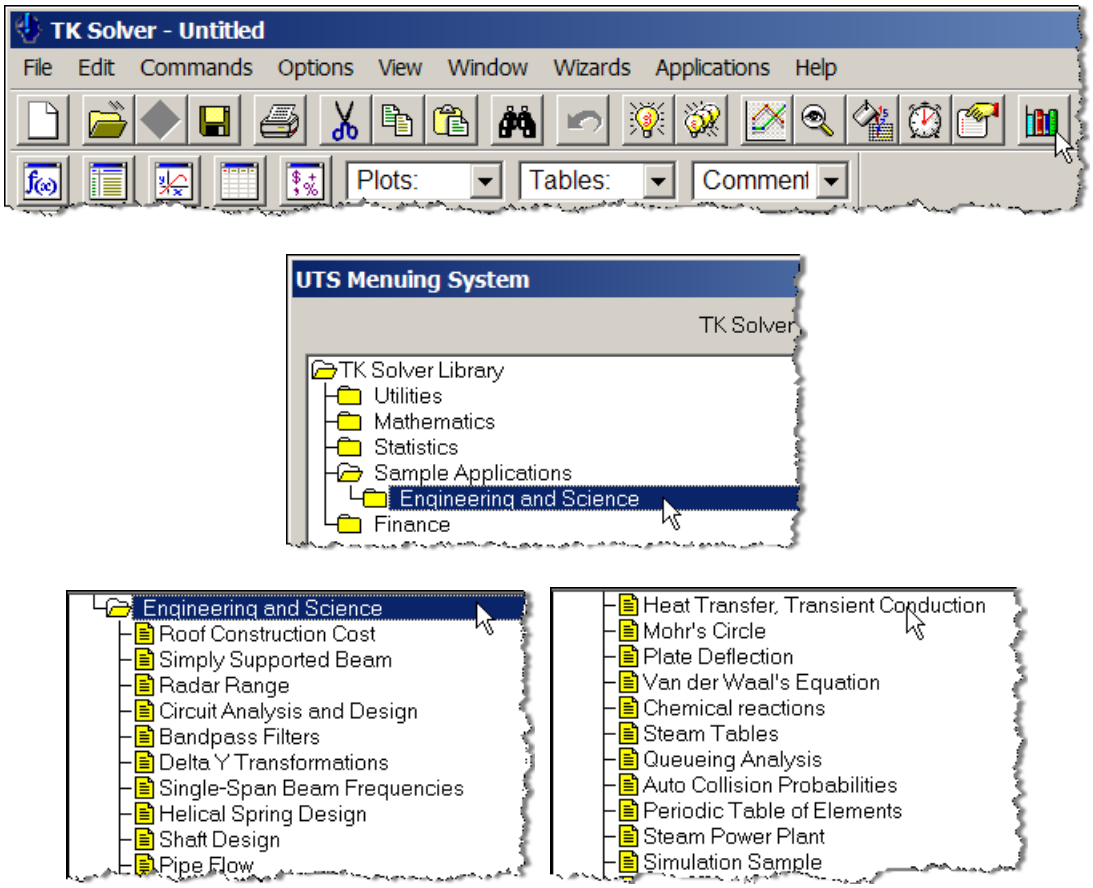

Figure 1

Most models have been built by implementing all the equations from popular textbooks or handbooks on subjects like heat transfer, vibrations, controls, chemistry, stress analysis, applied mathematics, thermodynamics, machine design, finance, statistics, etc. Double click on a specific application to see a summary of that model. If a model seems useful select **Add** pick the option to either insert or include the additional rules and variables (Figure 2). The first example here is a Mohr's circle calculation of principle inertias (or stresses) as shown in Figure 3.

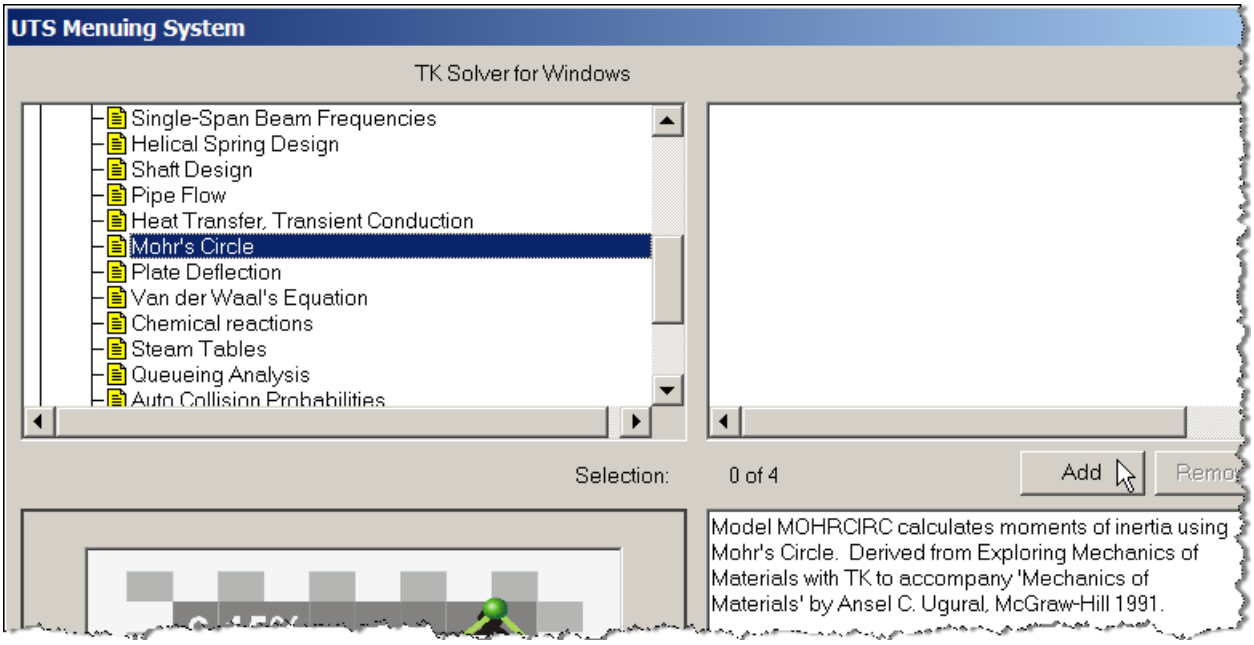

Figure 2

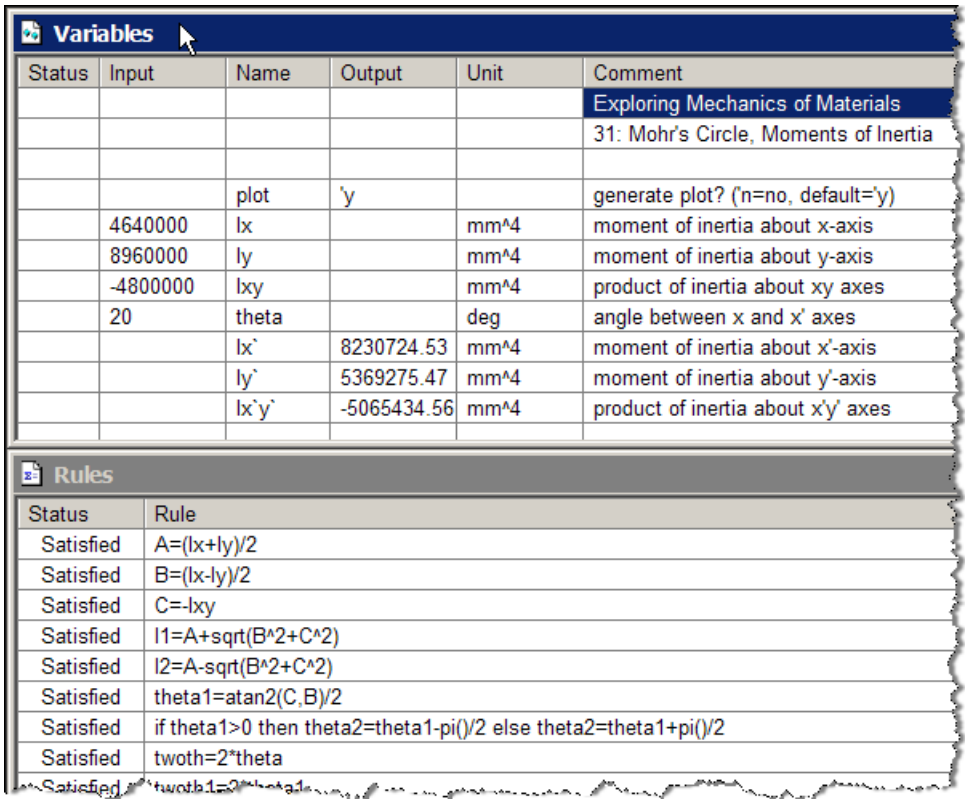

Figure 3

Another simple but common problem is solving for the roots of a cubic equation. That model, taken from the mathematics library is shown in Figure 4. A much more complicated example from the Optimization part of the mathematics library is the simultaneous solution of ordinary differential equations is seen in Figure 5. The optimizer finds the initial conditions for each equation to have a

specified *final condition*. There are many more applications available to illustrate what TK can do for you.

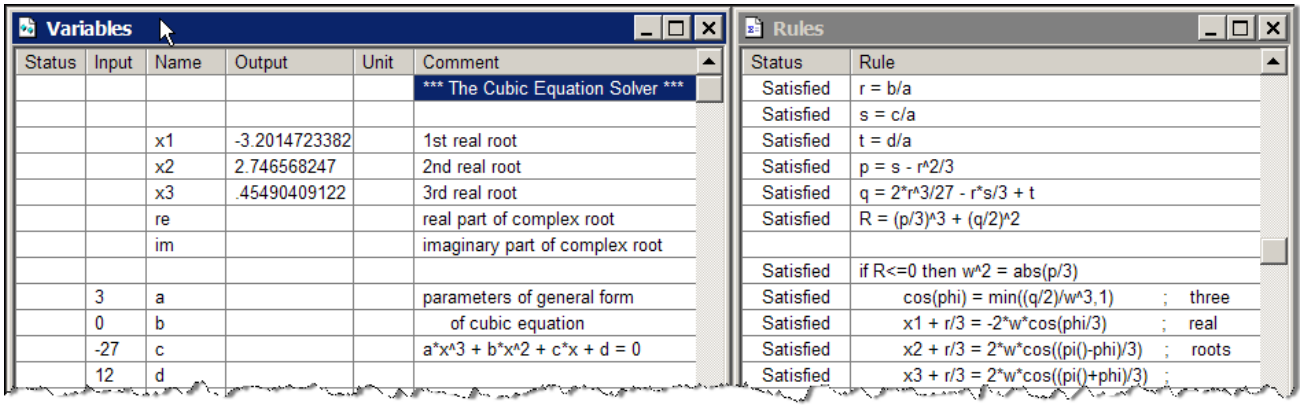

Figure 4

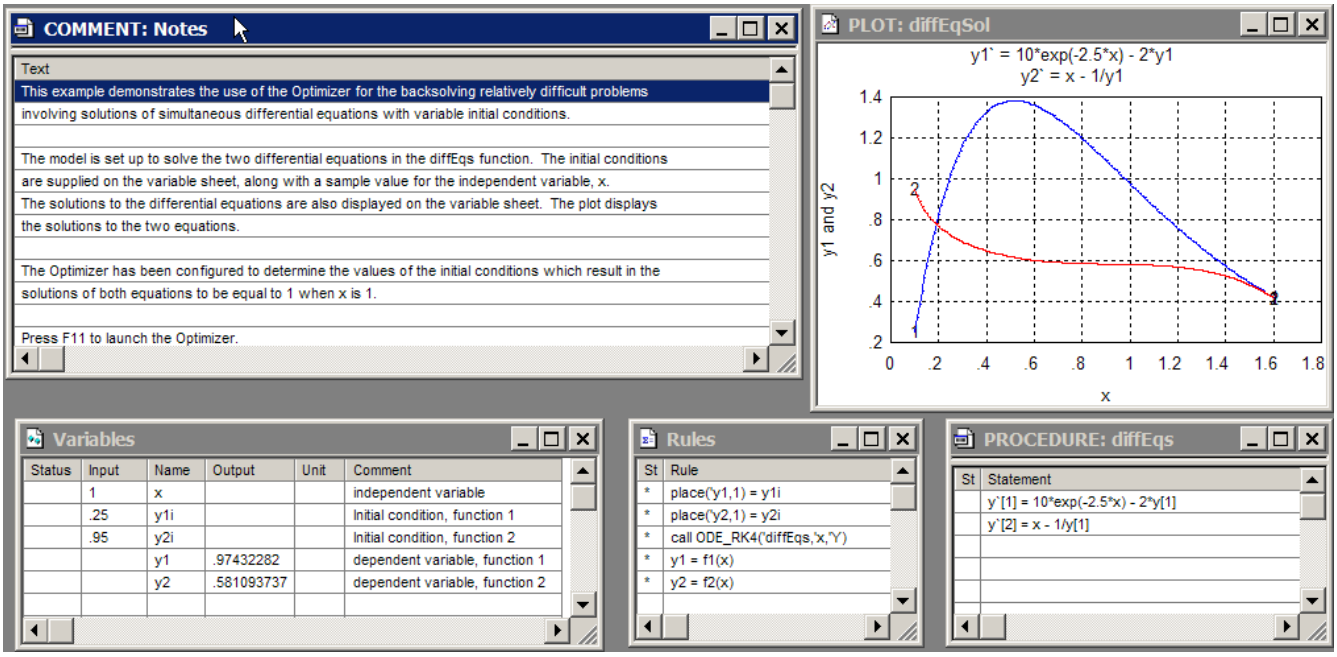

Figure 5

