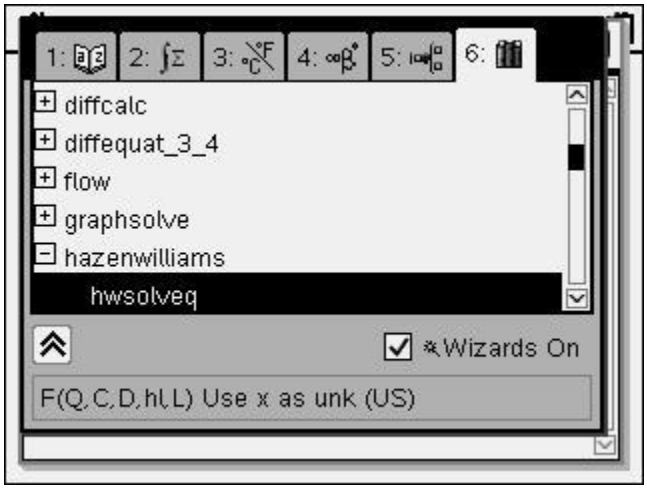
Hazen-Williams Equation Solver

This application will solve the Hazen-Williams Equation for unknown variables. This can be solved empirically or symbolically. This solves the equation in terms of flow (Q) or an optional program in terms of (v). It is provided for both of these in US and SI units. The assumptions of the Hazen-Williams Equation should be known prior to use such as only pressurized pipes between 40°-75°F and can only be used for water. As this equation is almost solely used in circular conduits, **this does not solve for non-circular conduits**. Also another note, if "S" is given instead of h_l and L, just used "1" as the L term and input the value of "S" in the h_l input as $S = h_l/L$. As always, convert terms into equivalent ones. The Hazen-Williams Equation is shown below:

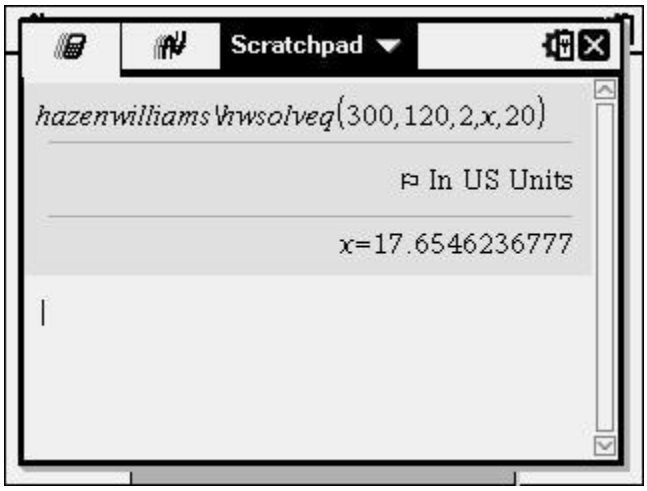
$$\textbf{Hazen-Williams Equation: } V = k\, C\, (D/4)^{0.63}\, S^{0.54} \quad \text{where} \quad S = h_f / L$$

The programs are all the same format and can be used as follows:

Hwsolveq() - solves the equation in terms of flow (Q) and in US units. The wizard prompts the required variables as such:



As it indicates you will use "x" as the unknown variable. For example if you have a flow of 300 ft^3/s, C value of 120, diameter of 2 feet, with a length of 20 feet solving for head loss, the input would look like:



And it can be seen that the head loss would be 17.65 ft. The remaining programs can be used for the following:

Hwsolveq_m() – Solves the HW Equation in terms of (Q) using SI or Metric (M) units.

Hwsolvev() – Solves the HW Equation in terms of (v) using US units.

Hwsolvev_m() – Solves the HW Equation in terms of (v) using SI or Metric (M) units.

Remember to put in the “MyLib” folder in the root of the calculator and to refresh the library before use. Let me know if you think I have made a mistake.

Thanks,

Brian