Name: _____
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Introduction to Ground-Water Modeling
15-040-602

Third Exercise (revised 1/23/01)

Pictured below is a poorly drawn constant-head Darcy apparatus. We have already derived an analytical solution to determine head. Construct a spreadsheet to determine the head at fixed 1cm intervals from the left side to the right side of the sample chamber using the Gauss-Seidel technique and a closure error of 0.001. Note that the flow is one-dimensional so Laplace's equation becomes $\frac{d^2h}{dx^2} = 0$ and each head will be equal to the average of the *two* adjacent points. Determine the head analytically for each node. As with the previous exercise, please submit the spreadsheet showing the formulae and again showing the solution. Assume h_{in} and h_{out} are 80cm and 10cm respectively and L is 12cm. List all other assumptions you have made.