FLUENT - Laminar Pipe Flow - Problem 2

Site Under Construction

We are working on updating this part of the tutorial. Please come back soon.

Problem 2

Problem

On your finest mesh (100x20), rerun the *FLUENT* calculation for Reynolds numbers 200 and 500 using the "second-order upwind" scheme. Note: change the Reynolds number by adjusting the molecular viscosity μ. Plot the centerline velocity and skin friction as a function of axial distance for Re = 100 (previous problem), 200, and 500. Plot all three cases on the same graph for comparsion. Briefly explain the trend you observe as the Reynolds number increases.

Hints

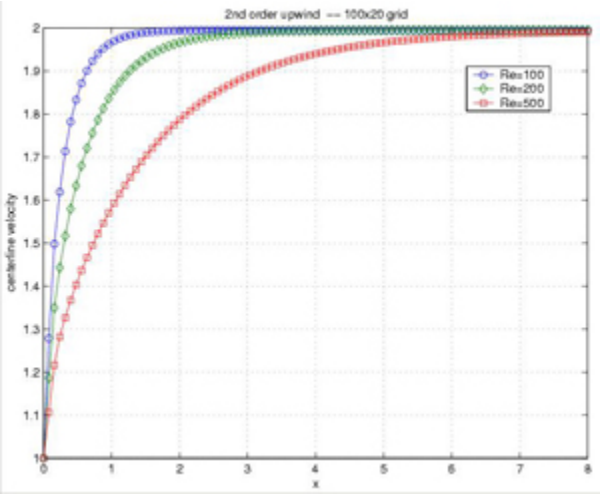
If you've saved the 100x20 mesh in step 7, you can load it into *FLUENT* again without having to recreate it in *GAMBIT*.

Solve for μ for each of the Reynolds number first and then think about what steps need to be changed.

Solution

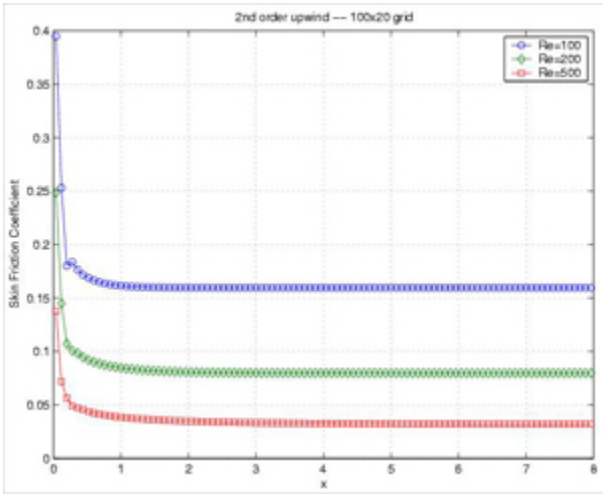
Your solution should look something like the plots below:

Centerline Velocity



Higher Resolution Image

Skin Coefficient



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