Physics 3345 | **Professor Scalise**
Fall 2000 | **Assignment #12**

Due: Monday 4 December 2000

The final exam is on Thursday 14 December 11:30am - 2:30pm in 11 Fondren Science.

1. A 4-cm diameter horizontal pipe carrying water at 10 m/s changes to a diameter of 40 cm.
   (a) What is the speed of water in the large pipe?
   (b) In which pipe is the pressure greater?
   (c) What is the difference in pressure between the two pipes?
2. Marion & Thornton 14-27.
3. If the electron from the problem above is at rest, what kinetic energy must the positron have in order to produce a proton + antiproton?
4. A uranium-235 nucleus at rest decays into krypton and barium. Find the final speeds of the decay products.
5. A Z-boson decays into an electron and a positron. What γ factor must the Z-boson have in the lab so that no decay products move in the direction from which the Z came. That is, the decay products are either at rest in the lab, or moving along the same direction as the Z.