Florida International University
Department of Civil and Environmental Engineering

CWR 3201 Fluid Mechanics, Fall 2018
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Homework Assignment 5
*Mechanics of Fluids (**Fifth edition**), by M.C. Potter, D.C. Wiggert and B.H. Ramadan.*

1. 6.20 (same number in *Fourth edition*)
   It is suggested that the velocity of the water flowing from a hole in the side of an open tank depends on the height H of the hole from the surface, the gravity, and the density of the water. What expression relates the variables?

2. 6.22 (same number in *Fourth edition*)

   The pressure drop Δp in the pipe of Fig. P6.22 depends on the average velocity, the pipe diameter, the kinematic viscosity, the length L of pipe, the wall roughness height e, and the fluid density. Find an expression for Δp.
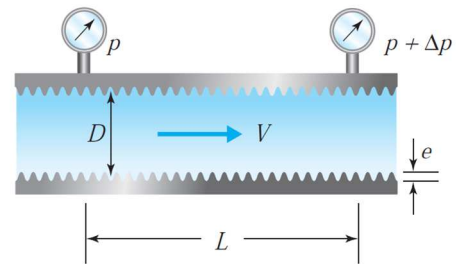

Fig. P6.22

3. 6.45 (same number in *Fourth edition*)
   A 1:7 scale model simulates the operation of a large turbine that is to generate 200 kW with a flow rate of 1.5 m³/s. What flow rate should be used in the model, and what power output is expected?
   (a) Water at the same temperature is used in both model and prototype.
   (b) The model water is at 25°C and the prototype water is at 10°C.

4. 6.56 (same number in *Fourth edition*)
   The flow rate over a weir is 2 m³/s of water. A 1:10 scale model of the weir is tested in a water channel.
   (a) What flow rate should be used?
   (b) If a force of 12 N is measured on the model, what force would be expected on the prototype?

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