CE 313 Hydraulic Engineering
Winter 2013

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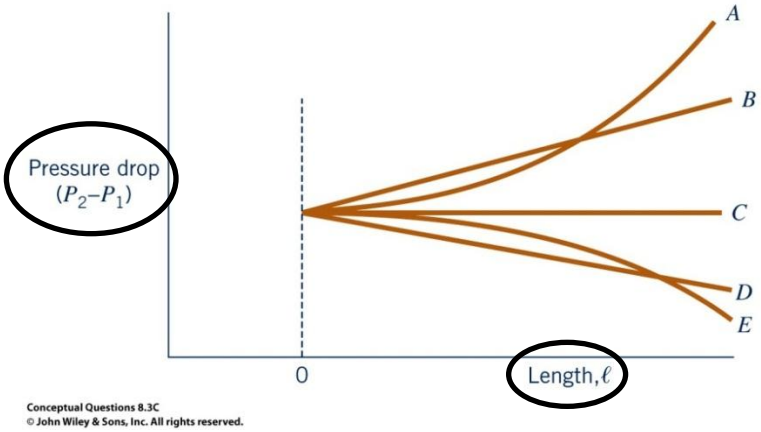
Quiz 1 - Chapter 8 Viscous Flow in Pipes (Part 1) **Name:** _____

Answer the following questions to the best of your ability.

1. For fully developed viscous flow in a horizontal pipe, which of the following is true?

   a. Pressure forces are balanced by shear forces
   b. Pressure forces result in fluid acceleration
   c. Shear forces result in fluid deceleration
   d. Pressure forces are balanced by body forces
   e. Body forces result in fluid deceleration

2. Water flows steadily through a horizontal circular pipe. Which curve most correctly describes the pressure change (P_2-P_1, see plot below) through the pipe as the length is increased?



   a. A
   b. B
   c. C
   d. D
   e. E

3. At a certain section in a pipeline, a reducer is used to reduce the diameter from 2D gradually to diameter D. When an incompressible fluid flows through this pipeline, the velocity is U1 in the first section and U2 in the second section. Which of the following is a true conclusion?

   a. $U_2=4U_1$
   b. $U_2=2U_1$
   c. $U_2=U_1/2$
   d. $U_2=U_1/4$
   e. $U_2=U_1$

4. Water is pumped between two tanks as shown below. The energy line is indicated. Which of the following statements are the correct descriptions of the condition presented below?

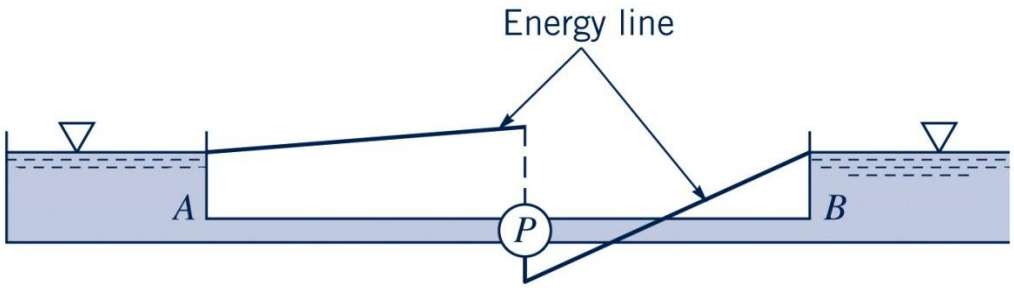


Figure P8.36

A. The fluid is being pumped from A to B
B. The fluid is being pumped from B to A
C. The pipe from point A to the pump has larger diameter than the pipe from point B to the pump
D. The pipe from point B to the pump has larger diameter than the pipe from point A to the pump

a. A and C
b. A and D
c. B and C
d. B and D
e. None of the above

5. When measuring the **average velocity of the flow** within the pipe system shown below, which regions of the pipe system are the most optimal locations for the placement of a flow measurement device?

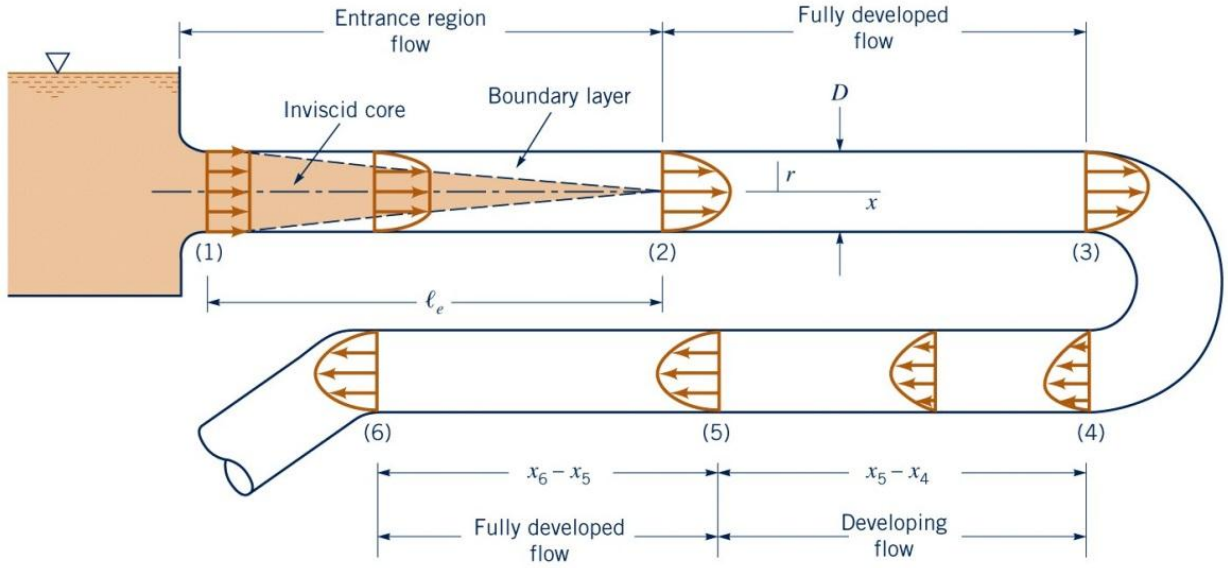


Figure 8.5

a. Region (1)-(2) and region (3)-(4)
b. Region (1)-(2) only
c. Region (2)-(3) and region (3)-(4)
d. Region (2)-(3) and region (5)-(6)
e. Nowhere