

**CE 313 Hydraulic Engineering**  
**Winter 2013**

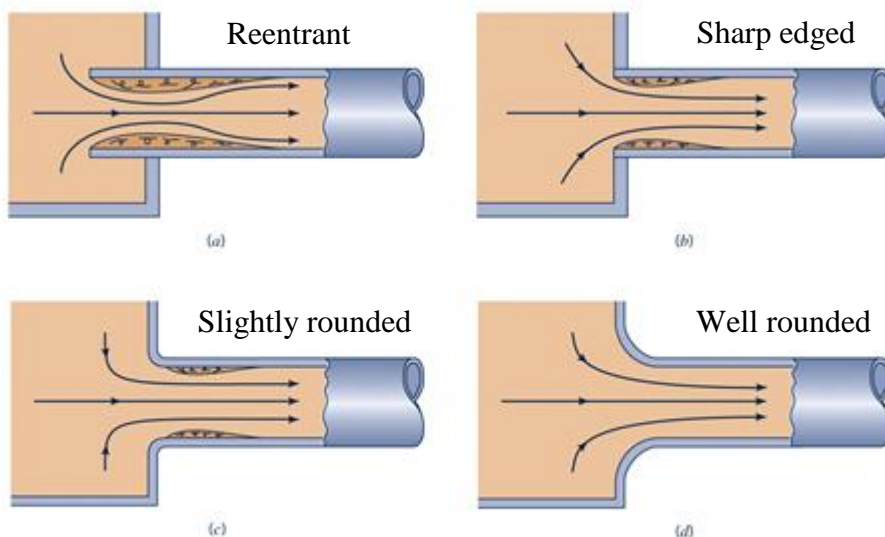
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**Quiz 2 - Chapter 8 Viscous Flow in Pipes (Part 2)**

**Name:** \_\_\_\_\_

Answer the following questions to the best of your ability.

1. Crude oil is flowing through a pipe of diameter 1.25 m diameter and relative roughness 0.002 at a Reynolds Number of  $2 \times 10^4$ . Specific gravity of the oil is 0.84 and dynamic viscosity of the oil is  $0.4 \text{ N}\cdot\text{s}/\text{m}^2$ . The head loss per 100 m (m) of this pipe is most nearly
  - a. 5.3
  - b. 7.1**
  - c. 9.2
  - d. 11.6
  - e. 4.3
  
2. A 20-cm diameter pipeline with a relative roughness of 0.01 has a total length of 45 m. When water is pumped through the pipe at a rate of  $5 \text{ m}^3/\text{min}$ , the major head loss (m) is most nearly
  - a. 3**
  - b. 10
  - c. 15
  - d. 20
  - e. 40
  
3. Four different entrance flow conditions are presented below. Which one of the five options correctly lists the  $K_L$  coefficient of the four entrance flow conditions from the largest to smallest?



- a. (a)-(b)-(c)-(d)**
- b. (b)-(c)-(d)-(e)
- c. (d)-(b)-(c)-(a)
- d. (d)-(c)-(b)-(a)
- e. (a)-(c)-(d)-(b)

Figure 8.22  
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4. Water flows at a rate of  $15\text{m}^3/\text{s}$  in a 1-m diameter pipeline and it is discharging to a large reservoir. Find the exit head loss.
- 3.9-m
  - 7.4-m
  - 18.6-m
  - 20.3-m
  - 23.2-m

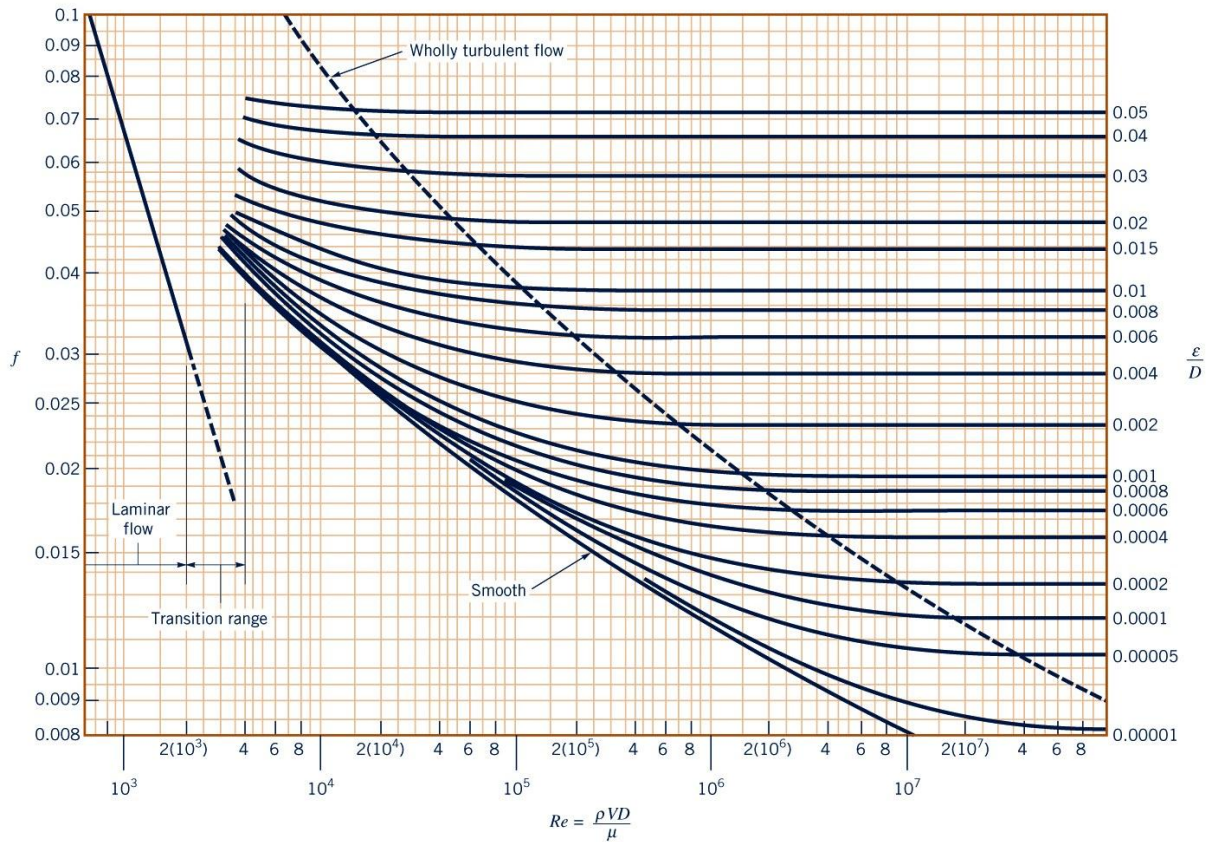


Figure 8.20  
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$$\rho_w = 999 \text{ kg/m}^3$$

$$\mu_w = 1.12 \times 10^{-3} \text{ N} \cdot \text{s/m}^2$$

$$h_L = f \frac{l}{D} \frac{V^2}{2g}$$

$$h_L = K_L \frac{V^2}{2g}$$

$$Re = \frac{\rho V D}{\mu}$$