**Chemical Engineering 374**

**Reading Questions 12—Chapter 8.1-8.4**

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

1. How is the change in temperature and its effect on fluid properties handled in practice, when dealing with fluid flows in pipes in heating/cooling applications?
2. What assumption is usually made about the effect of frictional heating on temperature?
3. Which forces are dominant for pipe flow applications (inertial or viscous) when the Reynolds number is approximately 100?
4. As uniform flow enters and flows along a circular pipe, the boundary layer at the wall grows towards the centerline.
   1. What do we say about the flow when the boundary layer has grown to the centerline of the pipe?
   2. What do we call the length of pipe along which the flow had proceeded before the boundary layer had grown to the centerline of the pipe?
5. Is the velocity profile in equation 8-17 true for any kind of fluid, or just Newtonian fluids? How do you know?
6. For laminar fluids, how is the Darcy friction factor related to the Reynolds number?
7. For non-circular pipes, what parameter do we use in place of the pipe diameter?