

BAE 103
Energy in Biological Systems

Problem Set No. 10
Concepts of Power, Energy, and Thermal Efficiency
Due Date: Wednesday, March 21

- 10.1 Friction loss associated with fluid flowing in a round conduit can be estimated using a dimensionless parameter termed Reynold's Number. Part of the estimation process involves determining the friction factor f which is a function of Reynold's Number. For Reynold's Numbers less than 2,000, the friction factor can be approximated as,

$$f = \frac{64}{N_R}$$

For Reynold's Numbers above 2,000, the friction factor is approximated as,

$$f = \frac{0.316}{N_R^{0.25}}$$

Develop a plot of the friction factor as a function of Reynold's Number over the range of 1 to 10,000.