10.56 In a 4-in. uncoated cast-iron pipe, 0.02 cfs (Q) of water flows at 60°F. Determine f from Fig. 8.20

f vs. $Re = \frac{VD}{\nu}$

for various k_s/D

$$Re = \frac{VD}{\nu} = \frac{Q/AD}{\nu} = \frac{4Q}{\pi D \nu} = \frac{4 \times .02}{\pi \cdot \frac{4}{12} \cdot 1.22 \times 10^{-5}}$$

$$= 6.3 \times 10^3 \quad \text{turbulent flow}$$

$k_s/D = .0025$ from ~~Fig 10.9~~ Table 8.1

$f(Re, k_s/D)$ from ~~Fig 10.8~~ Fig 8.20

$f = .038$