37.48 What is the Reynolds number for $1500gpm$ of $70°F$ water flowing in a standard weight steel pipe with a diameter of $10in$?

A. 32,000

B. 380,000

C. 480,000

D. 5,800,000

Use the Schedule 40 Steel Pipe table or the Steel Pipe Friction Tables to find the diameter of nominal $10in$ pipe.

$$D = 10.02in$$

Use the Steel Pipe Friction Tables to find the velocity for $1500gpm$ flowing in a $10in$ pipe. This saves time as compared with calulating $v = \frac{Q}{A}$, which is equally valid.

$$v = 6.1\frac{ft}{s}$$

Look up the kinematic viscosity for $70°F$ water in the Properties of Water table.

$$\nu_{@70°F} = 1.059 \times 10^{-5}\frac{ft^2}{s}$$

Calculate the Reynolds Number.

$$Re = \frac{vD}{\nu} = \frac{\left(6.1\frac{ft}{s}\right)\left(\frac{10.02in}{12\frac{in}{ft}}\right)}{1.059 \times 10^{-5}\frac{ft^2}{s}} = 480,000$$

Answer C