A 5 Problem statement,

making of fuction that relative error is sufficiently low for accurate computation of friction factors for all values of Reynold's number.

given,

$\left. \begin{array}{l} Re : 10,000 \text{ to } 500,000 \\ f : 0.001 \text{ to } 0.01 \end{array} \right\}$ typical values

$\left. \begin{array}{l} Re : 2500 \text{ to } 1,000,000 \\ f = ? \end{array} \right\}$ user defined

equation,

$$\frac{1}{\sqrt{f}} = 4 \log_{10} (Re \sqrt{f}) - 0.4$$

SOL^n:

$$\frac{1 + 0.4}{\sqrt{f}} = 4 \log_{10} (Re \sqrt{f})$$

$$10^{\left[\frac{1 + 0.4\sqrt{f}}{4\sqrt{f}} \right]} = Re \sqrt{f}$$

secant method formula:

$$x_{i+1} = x_i - \left(\frac{f(x_i)[x_{i-1} - x_i]}{f(x_{i-1}) - f(x_i)} \right)$$

for input $Re = 2(2) 21$ $f = 0.00999815139.$