$$S_0 = \frac{\ell_0}{\ell_w}$$

$$\ell_0 = S_0 \times \ell_w = 0.7 \times 1000 = 700$$

$$P = \frac{700 \times 9.81 \times 500 \times 10^{-3} \times 163.23}{1000}$$

$$= 560.45 \text{ KW}$$

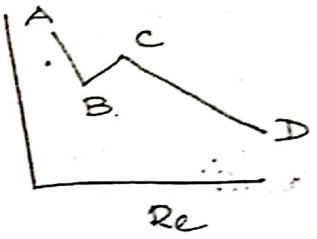
Team 2

Friction Factor: (f)

It is a dimensional less term. It depends upon following parameters

(i) Reynold's number

(ii) Relative roughness of pipe surface.



For laminar flow

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

For turbulent flow,

$$f = \frac{0.316}{(Re)^{\frac{1}{4}}}$$

$f = 4f'$

Coefficient of Friction: (f')

Function of Reynolds number.

$$(f') = \frac{16}{Re}$$

$$f = \frac{0.079}{(Re)^{\frac{1}{4}}}$$

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Moody's Diagram:

Moody diagram developed by Prof. Lewis. F. Moody, shows the variation of friction factor f with the governing parameters, viz. the Reynolds number of flow and the relative roughness $\left(\frac{\varepsilon}{D}\right)$; where 'ε' - absolute/average roughness and 'D'- diameter of pipe.

Used to determine friction factor for commercial pipes.

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Minor losses: