

$$mgh = ML^2T^{-2}$$

$$\text{Viscosidade} = \frac{E}{A \cdot V} = \frac{ML^2T^{-2}}{L^2 \cdot LT^{-1}} = ML^{-1}T^{-1}$$

$$Pa \Rightarrow \text{unidade Pressão} = \rho gh = ML^{-3}LT^{-2}L$$

$$Pa = ML^{-1}T^{-2}$$

$$Pa \cdot s = ML^{-1}T^{-2} \cdot T = ML^{-1}T^{-1}$$

$$1g = 100cg = 1000mg$$

$$1\text{poise} = 100\text{Centipoise}$$

$$1\text{poise} = \frac{1g}{cm \cdot s}$$

$$Pa \cdot s = \frac{kg}{m \cdot s} = \left( \frac{1000g}{100cm \cdot s} \right)$$

=

$$0,1$$

$$1) \frac{720L}{min} \quad \frac{L}{s}, \frac{cm^3}{s}, \frac{m^3}{s}$$

$$\frac{720L}{60s} = 12Ls^{-1}$$

$$1L = 1000cm^3 \quad \frac{720000cm^3}{60s} = 12 \cdot 10^3 cm^3 s^{-1}$$

$$1m^3 = 1000L \quad \frac{0,720L}{60s} = 0,012m^3 s^{-1}$$

2)  $\varnothing = 2,25 \text{ cm}$   
 $V = 0,30 \text{ m s}^{-1}$   
 $Q = \text{L/min} (?)$

$$Q = S \cdot V \quad S = \frac{\pi d^2}{4} = \frac{\pi \cdot (0,0225)^2}{4}$$

$\swarrow \text{mm}$

$$S = 3,9760 \cdot 10^{-4} \text{ m}^2$$

$$Q = 3,9760 \cdot 10^{-4} \cdot 0,3 = 1,1928 \cdot 10^{-4} \text{ m}^3 \text{ s}^{-1}$$

$\downarrow$

$\times 1000 \times 60$

$$\boxed{Q = 7,15 \text{ L min}^{-1}}$$

3)

$$Q_1 = Q_2$$

$$\boxed{d = \varnothing}$$

$$S_1 \cdot V_1 = S_2 \cdot V_2$$

$$\frac{\pi d_1^2}{4} \cdot V_1 = \frac{\pi d_2^2}{4} \cdot \boxed{V_2}$$

$\downarrow$   $5,0 \text{ cm s}^{-1}$        $\downarrow$   $4 \text{ cm}$

4)

$$=$$

$$5) \text{ Volume}_{\text{reservatório}} = \frac{\pi d^2}{4} \cdot h$$

$\nearrow \perp, 5 \text{ m}$   
 $\nearrow +, 5$

tempo = 30'

$\phi = ?$        $V = 0,2 \text{ m/s}$

a velocidade está em segundos

$Q = S \cdot V$

$\nearrow \frac{\pi d^2}{4} \cdot \phi(?)$

$Q = \frac{\text{Volume}}{\text{tempo}}$

$L'' = 0,0254 \text{ m}$

$\frac{\text{m}^3}{\text{s}}$

Colocar em "1/2"

$$6) \frac{P_1}{\rho_1} + \frac{V_1^2}{2g} + Z_1 = \frac{P_2}{\rho_2} + \frac{V_2^2}{2g} + Z_2 \quad (1)$$

$P_1 = 2,6 \cdot 10^5 \text{ Pa}$

$\rho = \rho \cdot g \Rightarrow \rho_1 = 900 \cdot 9,81 = \underline{\hspace{2cm}}$

$\rho_2 = \underline{\hspace{2cm}}$  (mesma coisa)

$Z_1 = Z_2$

$Q_1 = S_1 \cdot V_1$

$Q_1 = \frac{\pi d_1^2}{4} \cdot V_1$

$d_1 = 10 \text{ cm}$        $V_1 = 2,5 \text{ m/s}$

$Q_1 = Q_2$

$Q_2 = \frac{\pi d_2^2}{4} \cdot V_2$

$d_2 = 4 \text{ cm}$

Encontro  $V_2 = \underline{\hspace{2cm}}$

Substituo tudo na equação (1) e encontro  $P_2$

$$7) Q = S \cdot v$$

$$\frac{\pi d^2}{4} \rightarrow 6,5 \text{ cm}^2 = \underline{\hspace{2cm}} \text{ m}^2$$

$$v = \sqrt{2 g \cdot h} = \sqrt{2 \cdot 9,81 \cdot 0,3}$$

$$Q = \text{m}^2 \cdot \frac{\text{m}}{\text{s}} = \frac{\text{m}^3}{\text{s}} \times 1000 = \frac{\text{L}}{\text{s}}$$