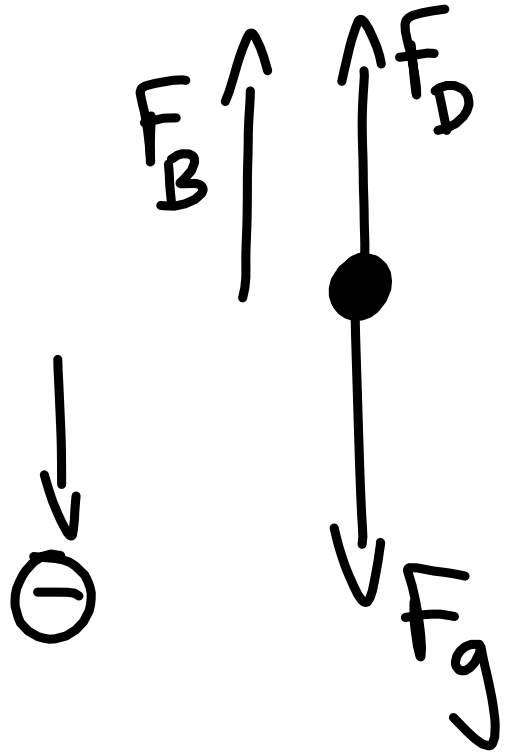

$$\Sigma \vec{F}_y = F_B + F_D - F_g = 0$$

$$\Sigma \vec{F}_y = m_w g + 6\pi\eta r v - m_s g = 0$$

N.B. $\Rightarrow$ $\rho = \frac{m}{V}$

$\rho V = m$

$$\Sigma \vec{F}_y = m_w g + 6\pi\eta r v - m_s g = 0$$

$$\rho_w \tfrac{4}{3}\pi r^3 g + 6\pi\eta r v - \rho_s \tfrac{4}{3}\pi r^3 g = 0$$

$$6\pi\eta r v = \rho_s \tfrac{4}{3}\pi r^3 g - \rho_w \tfrac{4}{3}\pi r^3 g$$

$$6\eta r v = \tfrac{4}{3} r^3 g (\rho_s - \rho_w)$$

$$\eta = \frac{\frac{4}{3} r^2 g (\rho_s - \rho_w)}{6 r v}$$

$$\eta = \frac{4r^2 g \Delta\rho}{3 \cdot 6 v}$$

$\frac{N}{m^2}$

$$\eta = \frac{4r^2 g \Delta\rho}{18 v}$$

$P_q \cdot S$

$$\eta = \frac{2r^2 g \Delta\rho}{9 v}$$

$$\frac{m \cdot \frac{m}{s^2} \cdot \frac{kg}{m^3}}{\frac{m}{s}}$$