Conversion Factors

Mass & Force:

$$\frac{14.59\text{ kg}}{\text{slug}} \qquad \frac{32.174\text{ lb}_\text{m}}{\text{slug}} \qquad \frac{2.205\text{ lb}_\text{m}}{\text{kg}} \qquad \frac{2000\text{ lb}_\text{m}}{\text{ton}_\text{m}} \qquad \frac{1000\text{ kg}}{\text{metric ton}_\text{m}} \qquad \frac{4.448\text{ N}}{\text{lb}_\text{f}} \qquad \frac{10^5\text{ dynes}}{\text{N}}$$

Length:

$$\frac{3.281\text{ ft}}{\text{m}} \qquad \frac{39.37\text{ in}}{\text{m}} \qquad \frac{12\text{ ft}}{\text{in}} \qquad \frac{1.609\text{ km}}{\text{mi}} \qquad \frac{5280\text{ ft}}{\text{mi}}$$

Volume:

$$\frac{7.48\text{ gal}}{\text{ft}^3} \qquad \frac{3.785\text{ L}}{\text{gal}} \qquad \frac{1000\text{ L}}{\text{m}^3} \qquad \frac{1.201\text{ U.S. gal}}{\text{Imperial gallon}}$$

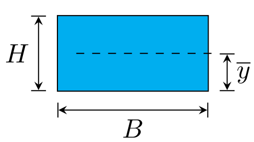
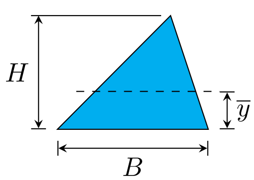
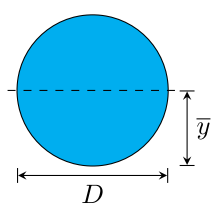
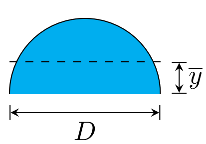
Volume Flow Rate:

$$\frac{449\text{ gal/min}}{\text{ft}^3/\text{s}} \qquad \frac{3.785\text{ L/min}}{\text{gal/min}} \qquad \frac{60{,}000\text{ L/min}}{\text{m}^3/\text{s}}$$

Properties of water at 4°C

$$\gamma = 9.81\text{ kN/m}^3 = 62.4\text{ lb/ft}^3 \qquad \rho = 1000\text{ kg/m}^3 = 1.94\text{ slugs/ft}^3$$

Properties of Areas

	Area	Distance to Centroidal axis ($\overline{y}$)	Moment of Inertia about Centroidal Axis (I_c)
	BH	$H/2$	$BH^3/12$
	$BH/2$	$H/3$	$BH^3/36$
	$\pi D^2/4$	$D/2$	$\pi D^4/64$
	$\pi D^2/8$	$2D/(3\pi)$	$\left(\frac{\pi}{128} - \frac{1}{18\pi}\right) D^4$

Key Equations

PRESSURE	$p = \dfrac{F}{A}$	BULK MODULUS	$E = \dfrac{-\Delta p}{(\Delta V)/V}$
DENSITY	$\rho = m/V$	SPECIFIC WEIGHT	$\gamma = mg/V$
DYNAMIC VISCOSITY	$\eta = \tau \left(\dfrac{\Delta y}{\Delta v}\right)$	KINEMATIC VISCOSITY	$\nu = \eta/\rho$
ABSOLUTE AND GAUGE PRESSURE		$p_{\text{abs}} = p_{\text{gauge}} + p_{\text{atm}}$	
PRESSURE-ELEVATION RELATIONSHIP		$\Delta p = \gamma h$	
FORCE ON A SUBMERGED PLANE AREA		$F_R = \gamma h_c A$	
LOCATION OF CENTER OF PRESSURE		$L_p = L_c + \dfrac{I_c}{L_c A}\,,$	$h_p = h_c + \dfrac{I_c \sin^2 \theta}{h_c A}$
PIEZOMETRIC HEAD	$h_a = p_a/\gamma$	BUOYANT FORCE	$F_b = \gamma_f\, V_d$