$=$ $/$ $=$ $=$ $($ $)$ $/$ $($ $)$

$$F_B = \rho_f V g \qquad\qquad (p) + \qquad (½\rho v^2) +$$

$(\rho g y) =$

P08 $V = m/\rho = 5.98 \times 10^{24}/(1.00 \times 10^{19}) = 4\pi r^3/3$; from which, we find the radius to be $r = 52.3$ m .

P13 $Y = (F/A)/(\Delta L/L_0)$; $F = 70.6$ N, $A = 4.07 \times 10^{-7}$ m^2 & $\Delta L/L_0 = 4.94 \times 10^{-4} \Rightarrow Y = 3.51 \times 10^{11}$ N/m^2 .

P20 $\Delta V = -0.02\,V_0$, $\Delta P = -B(\Delta V/V_0) = -(2.2 \times 10^9\ \text{Pa})(-0.02) = 4.4 \times 10^7$ (Pa) .

P21 $\Delta V/V_0 = -0.120$, $\Delta P = 1.00 \times 10^6$ Pa, so $B = -\Delta P/(\Delta V/V_0) = 8.33 \times 10^6$ Pa .

P22 $A = (2\pi r)\,t = 6.28 \times 10^{-4}$ m^2, $F = $ (stress)$A = 2.51 \times 10^5$ N .

P23 For glass $B = 37.0$ GPa, $\Delta P = -1.00 \times 10^5$ Pa, $\Delta V/V_0 = -\Delta P/B = 2.70 \times 10^{-6}$.

P30 $\Delta P = \rho g h$, $h = \Delta P/\rho g = (2.8 - 1.2) \times 10^5/(10^3 \times 9.80) = 16.3$ (m) .

P31 (**a**) $P = \rho g h = (1025)(9.80)(1600) = 1.61 \times 10^7$ Pa; (**b**) $B = 2.20 \times 10^9$ Pa. $\rho = m/V = \rho_0 V_0/(V_0 + \Delta V) = \rho_0 - \rho_0 \Delta V/V_0$, $(\rho - \rho_0)/\rho_0 = -\Delta V/V_0 = +\Delta P/B = 7.35 \times 10^{-3} = 0.74\%$.

P35 Let $y = 0$ at the water-Kerosene interface. $\rho_k g h_k = \rho_w g h_w$, $(870)g h_k = (1000)g(10.0)$, $h_k = 11.5$ cm .

P52 $F_B = F_g \Rightarrow \rho_{sea} V_{sea} = \rho_{ice} V_{ice}$, or $V_{sea}/V_{ice} = \rho_{ice}/\rho_{sea} = 920/1030 = 89.3\%$.

P53 $W_c = \rho_w(\Delta V)\,g = (1000)(24 \times 0.03)(9.80) = 7056$ (N) .

P66 (**a**) $v = (2\,g\,h)^{1/2} = (2 \times 9.80 \times 10.0)^{1/2} = 14.0$ (m/s); (**b**) $Av = (0.080)(1400) = 112$ (cm^3/s) .

P68 $P_t + (½)\rho\,v_t^2 = P_b + (½)\rho\,v_b^2 \Rightarrow P_b - P_t = (½)\rho(v_t^2 - v_b^2) = (½)(1.20)(360^2 - 300^2) = 23.7$ (kPa) .

P69 $F = A\Delta P = (20)(23.7 \times 10^3) = 475$ (kN).

P72 Flow rate $\Delta m/\Delta t = \rho A\,v = (1050)(1.60 \times 10^{-4})(0.300) = 0.0504$ kg/s; $v_1 A_1 = v_2 A_2 \Rightarrow v_2 = v_1\,(A_1/A_2) = (0.300)[(1.60 \times 10^{-4})/0.200] = 2.4 \times 10^{-4}$ (m/s) .

P87 $P = P_a + \rho g h_c = \rho g(h_a + h_c) = (13{,}600)(9.80)(0.7482 + 0.0283) = 103$ (kPa) .