HW 2.1 | Ch.6 # 79, 91

6.79) $\frac{P_A - P_B}{\gamma_0} = \frac{(sg)_m \cdot h}{sg_0} - h - (z_A - z_B)$

$= \frac{13.54 \cdot h}{.9} - h - (z_A - z_B)$

$= (15.04 - 1)h - (z_A - z_B)$

$= 14.04 \cdot h - (z_A - z_B)$

$\frac{P_A}{\gamma_0} + z_A \frac{V_A^2}{2g} = \frac{P_B}{\gamma_0} + z_B + \frac{V_B^2}{2g}$

$\frac{P_A - P_B}{\gamma_B} + (z_A - z_B) = \frac{V_B^2 - V_A^2}{2g}$

$\left[\left(14.04 \cdot \frac{28}{12}\right) - (z_A - z_B)\right] + (z_A - z_B) = \frac{(4V_A^2 - V_A^2)}{2 \cdot 32.2}$

$32.69 = \frac{15 V_A^2}{64.4}$

$\sqrt{V_A^2} = \sqrt{140.34}$

$V_A = 11.86 \text{ ft/s}$

6.91) $h_j = h - (h_1 + h_2)$

$= 3.5 - (.85 + .075)$

$= 2.6 - .925$

$h_j = 1.675 \text{ m}$

Ch. 7 # 11, 16

7.11)

Power = ?

$P_A = h_A \gamma Q$, $h_A = \frac{P_2}{\gamma} + (Z_2 - Z_1) + \frac{V_2^2}{2g} + h_L$

$h_A = \frac{5760.56}{62.9} + 120 + \frac{4.61^2}{2 \cdot 32.16} + 10.5$

$h_A = 223.13 \text{ ft}$

$P_A = 223.13 \cdot 62.4 \cdot \frac{.75}{449.60}$

$P_A = .70 hp$

7.16)

Power pump = ?

$P_A = h_A \gamma Q$, $h_A = \frac{P_2}{\gamma} + (Z_2 - Z_1) + h_L$

$= \frac{825}{8.33} + 14.5 + 4.2$

$= 99.04 + 14.5 + 4.2$

$h_A = 117.74 m$

$P_A = 117.74 \cdot 8.33 \cdot \frac{640}{6000}$

$P_A = 13.73 \text{ KW}$