(3)

$Q = 200$ GPM

10 ft cast iron

$d = 2''$

$K = .02$ in

$K_c = 0.5$

$K_B = 0.3 \times 3$

$K_v = 6$

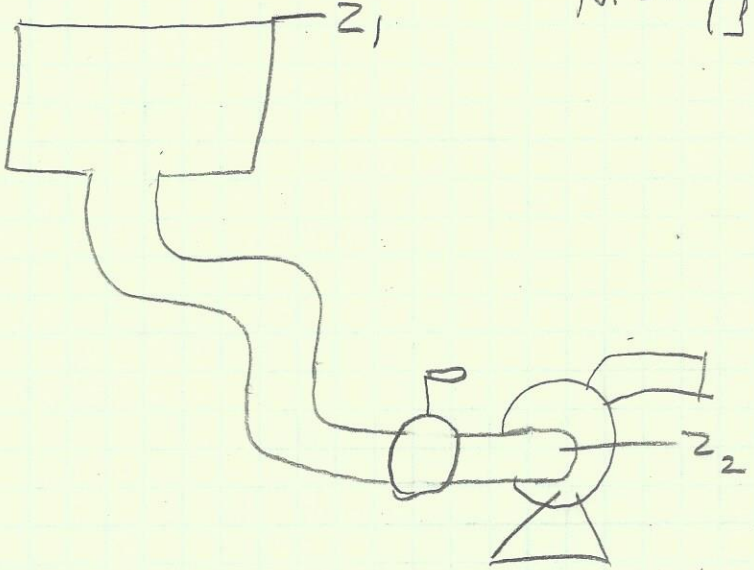
$p^* = 3.169$ kPa

$\rho = 997$ kg/m^3

$\mu = 8.91 \times 10^{-4}$ $\frac{kg}{m \cdot s}$

$P_{atm} = 101.3$ kPa

$$NPSH = \left(\frac{p}{\rho g} + \frac{V^2}{2g}\right)_{\substack{pump \\ inlet}} - \frac{P_{vap}}{\rho g}$$



Δz

$K/D = \frac{.02}{2} = .01$

$200 \frac{gal}{min} \times \frac{1 ft^3}{7.48 gal} \times \frac{1 min}{60 s}$

$= .446$ ft^3/s

$$g\Delta z - \frac{P_2 - P_{atm}}{\rho} - \frac{\bar{V}_2^2}{2} - 4f\frac{L}{D}\frac{\bar{V}_2^2}{2} - \Sigma K_f \frac{\bar{V}_2^2}{2}$$

$$\bar{V}_2 = \frac{.446 \text{ ft}^3/s}{\pi\left(\frac{2}{12}\right)^2 / 4} = 20.4 \text{ ft/s} \times .3048 \frac{m}{ft} = 6.22 \text{ m/s}$$

$NPSH = 3.7$ ft $= 1.12$ m

$$1.12 \text{ m} = \left(\frac{P_2}{997(9.8)} + \frac{6.2^2}{2(9.8)}\right) - \frac{3.169 \times 10^3}{997(9.8)}$$

$P_2 = -5.05$ kPa