Input Data		
Specific Weight=	61	lb/ft^3
Kinematic Viscosity=	0.00000438	ft^2/s
Suction Line Length=	10	ft
Discharge Line Length=	40	ft
D_1=	0.3355	ft
D_2=	0.0874	ft
D_3=	0.2557	ft
Wall Roughness, ε=	0.00015	ft
Le/D elbow=	30	
Le/D Gate Valve=	8	
Le/D Check Valve=	100	
Le/D Tees=	60	
Le/D Gate Valve (3/4 open)=	35	
Le/D Gate Valve (1/2 open)=	160	
Le/D Gate Valve (1/4 open)=	900	
A_1=	0.0884	ft^2
A_2=	0.006	ft^2
A_3=	0.05132	ft^2
Flow Rate=	0.646	ft^3/s
f_T, pipe 2=	0.022	
Zb=	15	ft
g=	32.2	ft/s^2

Problem A:

h_A= 41345.36 ft

P_A= 274.5 lb/ft^2

h_L= 41334.03 ft

Flow rate check:

0.6463 ft^3/s

Problem B:

Gate Valve Opening	K	h_{L2} (ft)	h_{A2} (ft)	Q_2 (ft^3/s)	h_{L3} (ft)	h_{A3} (ft)	Q_3 (ft^3/s)
Fully Open	0.176	1762.87	1774.199	0.6459	97.143	108.469	0.6448
3/4 Open	0.77	1869.81	1881.14	0.6463	97.143	108.469	0.6448
1/2 Open	3.52	2364.84	2376.17	0.6463	97.143	108.469	0.6448
1/4 Open	19.8	5295.45	5306.78	0.6463	97.143	108.469	0.6448

Q_{total} (ft^3/s)=	gpm=
1.2907	579.313381
1.2911	579.488189
1.2911	579.488189
1.2911	579.488189