

Name: _____

CVEN 339 – Water Resources Engineering
Summer Semester 2008
Dr. Kelly Brumbelow, Texas A&M University

Exam #1

Open-book, Open-notes (5 pages, 2 questions); Time allowed: 60 minutes

1. A Goulds 3408A pump will be used to lift water from one reservoir to another. Technical data for the pump is given on the next page. The elevation gain from the beginning to the ending reservoir is 65 ft. The pipe connecting the reservoirs is 6 inch diameter, asphalted cast iron ($\epsilon = 4 \cdot 10^{-4}$ ft), length 1120 ft (length includes the suction line). The pump suction line (i.e., the pipe between the beginning reservoir and the pump inflow connection) is 35 ft long, has a projecting entrance at the reservoir, and includes a swing check valve, a butterfly valve (fully open), and one 45° bend ($r/D = 4$). The pump will be installed 2.3 ft above the water surface elevation of the beginning reservoir.

Determine the following:

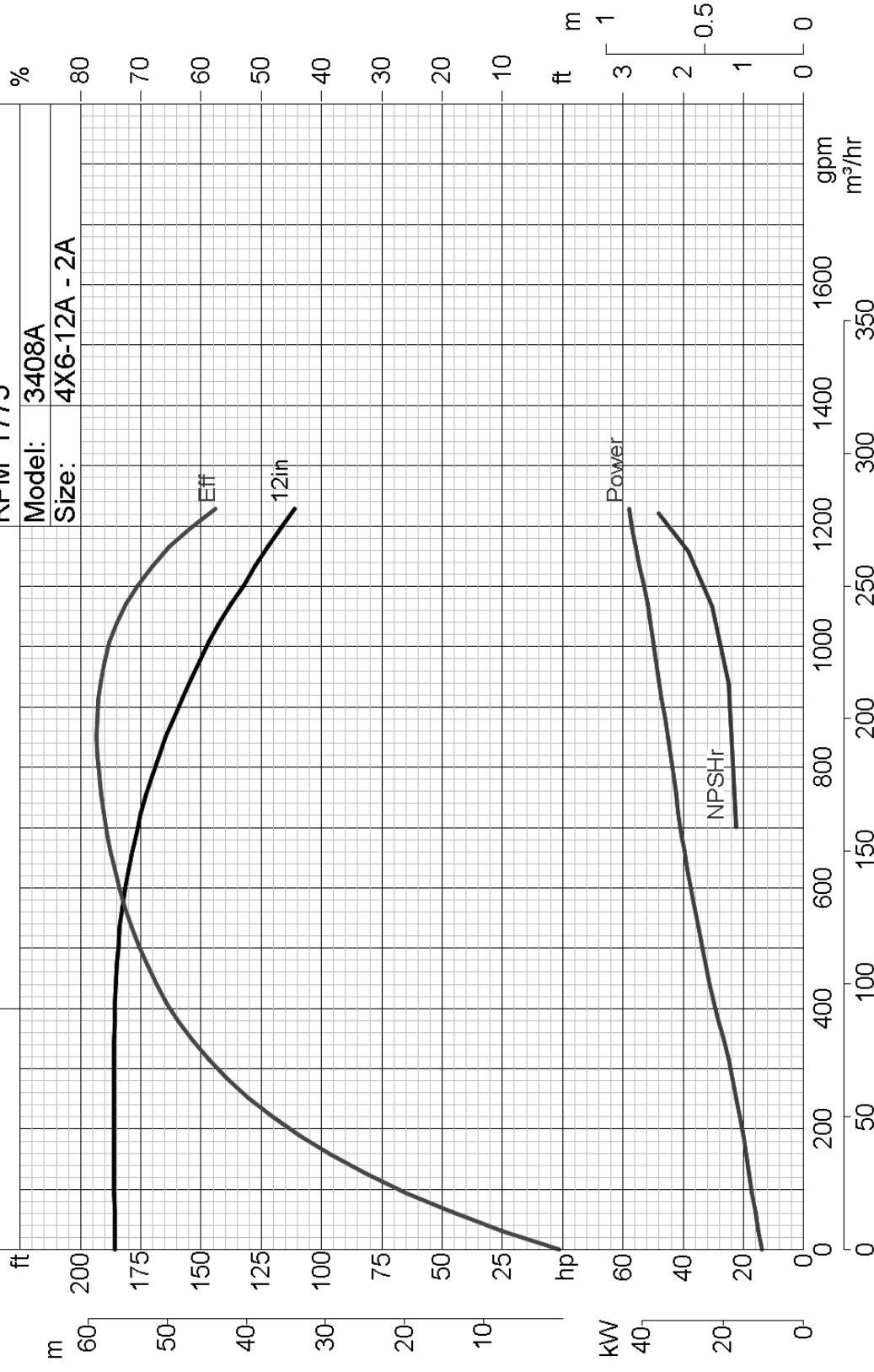
- (a) Flowrate (cfs) into the upper reservoir;*
- (b) Gross power consumption (kW) assuming motor efficiency of 73%; and*
- (c) If sufficient net positive suction head exists to avoid cavitation.*

(50 points)

(Work space for #1)

GOULDS PUMPS **CENTRIFUGAL PUMP CHARACTERISTICS** Based on CDS 6527-0

RPM 1775
Model: 3408A
Size: 4X6-12A - 2A

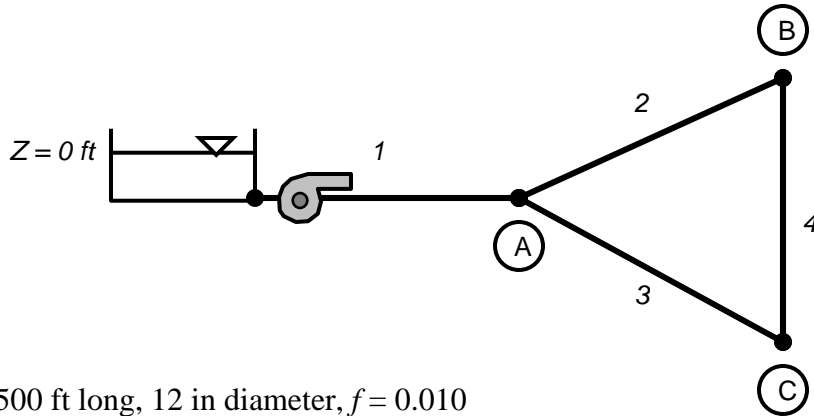


2. A simple pipe network is shown below. The characteristic curve for the included pump is also shown below.

Determine the following:

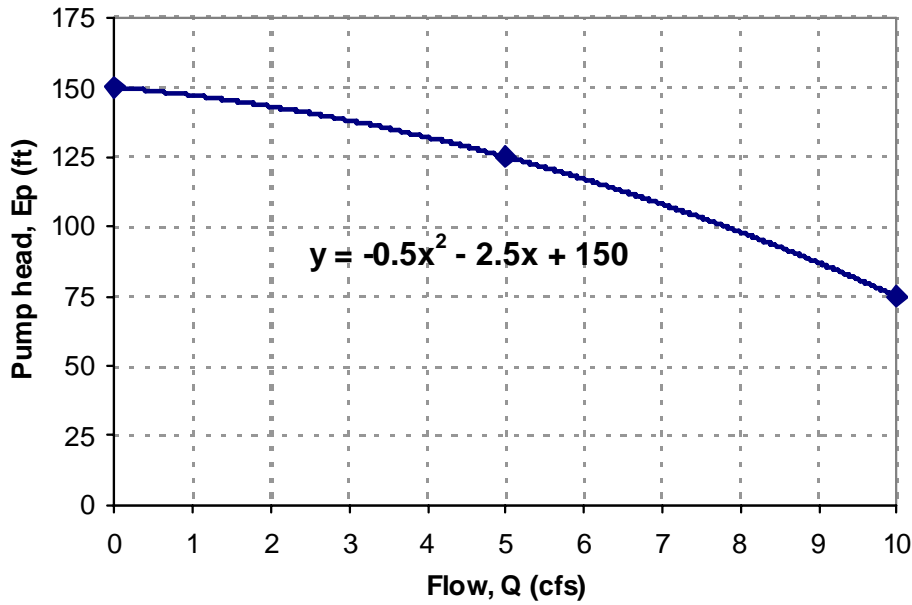
- (a) Flowrate (cfs) in all pipes; and
- (b) Pressure (psi) at all nodes.

(50 points)



All pipes are 500 ft long, 12 in diameter, $f = 0.010$

Node	Demand (cfs)	Elevation (ft)
A	1	10
B	3	5
C	1	25



(Work space for #2)