Peyton Brack
Test 1

1
This test demonstrates my work toward learning Bernoulli's principle and conservation of energy, as well as computing friction losses in pipes. This test really pushed me to grasp the overall understanding of Bernoullis and how the equation applies to different systems.
2

Problem 1

For this problem the first mistake I made was manipulating the manometric equation wrong. Because of this I also used the gamma h equation wrong and ended up with an answer that was not even close to correct. My calculations for mercury were close using the same method though.I gave myself false confidence because I assumed my check method was full proof, but it led me astray. Next time I should really take a step back and look if my equation is manipulated in the correct way.

Problem 2

For this problem I was able to get parts correct, while other parts were wildly off. Parts like the cost analysis were done correctly, but a lot of the pump calculations were off. I believe that I forgot to incorporate the filter into a lot of my equations, and I most likely manipulated Bernoulli's equation incorrectly as well. I think I make these manipulation mistakes so often because it is hard for me to tell when I am doing them so incorrectly. I think one way to combat this is to take a step back and find out if the numbers I am getting are actually realistic.

3: Problem grading

Purpose	0.5/10.0
Drawings	1.0/10.0
Sources	1.0/10.0
Design considerations	1.0/10.0
Data and variables	0.5/10.0
Procedure	1.0/10.0
Calculations	1/10.0
Summary	0.5/10.0
Materials	0.5/10.0
Analysis	0.5/10.0
TOTAL	**8.5/10.0**

identify all unknown dimensions in drawing	0/7 out of 1/7
Cancel the distance with water (x)	0/7 out of 1/7
Solve for the gasoline distance (y)	0/7 out of 1/7

Correct excel spreadsheet	1/7 out of 1/7
Using excel, get mercury case	1/7 out of 1/7
Why results make sense and manometer length	1/7 out of 1/7
Final results	0/7 out of 1/7
TOTAL	**3/7 out of 7/7**

PROBLEM 2)

Select pipe diameter using 3 m/s	1/9 out of 1/9
Compute all energy losses	0/9 out of 1/9
h_A and pump power	0/9 out of 1/9
Pressure at pump inlet	0/9 out of 1/9
Correct excel spreadsheet	1/9 out of 1/9
Pump power for 4 other pipe sizes	1/9 out of 1/9
Installation, operating, and total costs	1/9 out of 1/9
What is the best pipe diameter?	1/9 out of 1/9
Final results	0/9 out of 1/9
TOTAL	**5/9 out of 9/9**

FINAL GRADE:

8.5 + (80/2)*(3/7+5/9) = 47.86

4

Issues I encountered while taking this test were my manipulations of equations. I tried to overcome this by trying to use the sample problems as a backbone for solving each of these problems. Some steps I took to complete this test were doing every little calculation on excel. I would definitely not change this aspect, as using excel made this test less math intensive. A newer concept I learned was how to use excel for a Bernoulli principle problem. I think engineers use this concept in their everyday life. Whenever an engineer calculates a problem, they are usually using excel for it. I believe once I get an internship I will be using this strategy of solving a problem on almost every problem I come across.So far I have not been able to use these concepts in my everyday life but I do plan to when I find an internship. The topic of fluid mechanics really interests me and I hope to pursue a job that uses these principles. I felt very successful on the cost analysis. Even though some of my numbers were incorrect, because of my incorrect calculations, I was still able to get the graph tren right, and was in the ballpark for pricing. I spent just over 6 hours on this test. I took small breaks but ultimately tried to finish in one sitting, which was a big mistake. For my next test I will take this test in the span of at least four days. Being able to look at a test like this with fresh eyes would

have granted me some type of advantage over staring at it endlessly for most of one day.