MET 330, Exam 1 Test Reflection

- 1.) Exam required us to test our knowledge of fluid viscosity, system pressures, pressure measuring apparatus', forces due to static fluids, as well as test our knowledge of object buoyancy and stability.
- 2.) Upon comparing my exam to the solution posted by Dr. Ayala, a few minor differences were found. For every problem of the exam, the rubric was followed as well as I was able to understand. Every section of the rubric was included in each problem. There were a few areas where my test differed from the provided test solution, such as how I labeled my data and variables. In problem #1, the method I used to show how the height of the mercury would change in the given conditions was not as clear as it was shown in the solutions. In my problem statement I did not point out the fact that the key to the problem was to realize how the mercury affects the outcome. That insight was realized, but as I said, it was not stated. In the calculations, the distance I found was correct but I stated the measurement in meters vice millimeters as shown in the solution. The method used to calculate the pressure at the given point was the same as was shown in the test solution which allowed me to calculate the correct answer.

Comparison of problem #2 of the exam, my solution followed the same path the solution key followed; I made a mathematical error in finding the width of the given structure. In the calculation to find the width (depth) of the structure, it seems that I mistakenly used an equation containing the volume of the imaginary fluid instead of an equation that used area as shown in the correct solution. The equation using volume would have worked just as well, but I made a mistake in calculating the area of the rectangle by subtracting the area of the quarter circle from the entire area of a rectangle with the incorrect dimensions. This was a critical mistake that caused all following calculations to be incorrect.

Problem #3 of the exam my solution contained all required sections. In the data and variables section, I did not list the specific weight of water as shown in the given test solution. In the procedure section, my given procedure matched what was expected in the key. Although the order I presented differed slightly from the key, the first calculation for the height of the package matched the correct answer given in the key. The remaining calculations and solutions matched the answer key. My summary and materials section accurately reflected the solution key, although my analysis did not include the additional calculations to show the objects stability if it were rolled axially 90 degrees.

3.) Test #1 Self grade:

WRITING RUBRIC

тот	AL		10.0/10.0
	10.	Analysis	1.0/10.0
	9.	Materials	0.5/10.0
	8.	Summary	0.5/10.0
	7.	Calculations	2.0/10.0
	6.	Procedure	2.0/10.0
	5.	Data and variables	0.5/10.0
	4.	Design considerations	1.0/10.0
	3.	Sources	1.0/10.0
	2.	Drawings	1.0/10.0
	1.	Purpose	0.5/10.0

PROBLEM 1)

TOTAL		3/3
3.	Final results	1/3
2.	Get P_A	1/3
1.	Determine the new vertical distances	1/3

PROBLEM 2)

1.	Compute the width of the system	0/7
2.	Compute the new water level	0/7
3.	Compute horizontal force	0/7

TOTAL		1/7
7.	Final results	0/7
6.	Horizontal force location	1/7
5.	Vertical force location	0/7
4.	4. Resultant force and direction	

PROBLEM 3)

TOTAL		5/5
5.	Final results	1/5
4.	Use a reference? Compare Lmc to Lcg	1/5
3.	Determine metacenter location (Lmc)	1/5
2.	Determine centers of buoyancy and gravity (Lo	g) 1/5
1.	Determine the submerged section	1/5

FINAL GRADE:

10.0 + (80/3)*(3/3+1/7+5/5) = 67.1

4. In completing this test I learned that all dimensions and reference points must be closely followed at every step. The problems presented, were real world problems that a mechanical engineer would be expected to be able to solve at any time. These concepts are used in areas such as engineering an HVAC system, fluid pipe lines, hydraulic systems, and ship design. In my current job, I have the opportunity to apply what I've learned in this class every day. My 6 colleagues are all Professional Mechanical Engineers. Each and every day I hear the importance of learning as much as I can regarding the concepts of the Fluid Mechanics class. I have already used the principals and methods shown in problem #1 to select the correct differential pressure gage in a ventilation system. I have also used the concepts I've learned thus far in preparing lab reports for my fluids lab class. Additionally, I will need all the knowledge gained in this course to prepare for the Fundamentals of Engineering exam as well as various tasks during my senior project.