

Reflection: Test One

For test one some of the learning objectives that were met were understanding the principle of hydrostatic equilibrium. This states that for a fluid at rest the pressure at any level within the system is constant. The examples included options within a manometer and on a curved surface as well. Buoyancy was another learning objective that was met, through solving problems related to the stability of a system as well as the force required to move a cylindrical gate.

I believe overall that this was a successful test for me. However, I would put into words more clearly how I am solving the problems along with the calculations. I left some considerations out for problem 3 such as steady state, incompressible, and isothermal that I will include next time for consistency.

PROBLEM 1

- Find out h_{water} 1/4
 - Apply manometry to get h_{oil} 1/4
 - The total height of the left leg 1/4
 - Final results 1/4
- TOTAL 4/4**

PROBLEM 2

- F_v (magnitude and location) 1/7
 - F_h (magnitude and location) 1/7
 - Moment to get cylinder weight 1/7
 - Resultant force and direction 1/7
 - Final results 1/7
- TOTAL 5/7**

PROBLEM 3

- Depth of ice into water 1/5
 - Center of gravity 1/5
 - Center of buoyancy 1/5
 - Metacenter 1/5
 - Final results (stable?) 1/5
- TOTAL 5/5**

FINAL GRADE

$$(10.0+9.99+8)/3 = (9.33 \text{ (HW)} + 10.0 \text{ (READING)} + (80/3)*(4/4 + 5/7 + 5/5)) \text{ (TEST PROBLEMS)} = 91.7\%$$

While completing the test, I had to reread a lot of the textbook, and apply what I found to ensure that I was following the correct procedure. I found myself taking a lot of time with question two- and second guessing the procedure. Thinking back to the principles of equilibrium that I learned in Statics was helpful, along with studying the diagrams in the textbook. While taking the test, I reviewed the materials, and problem questions with solutions, and took breaks in between questions in order to reset. I found this helpful to the overall process. For the next test, I will open it sooner, and understand all the steps required to complete the test.

I have a deeper understanding of buoyancy, beyond Physics 1 now as well as hydrostatic force and equilibrium on various types of surfaces. These concepts will be particularly useful when designing pipelines, tunnels (underwater), floating structures, and designing storage tanks. Fluids are everywhere, and in almost every engineering field, understanding their properties is critical to creating designs that work, and work efficiently. I am currently interning as a Tunnel Systems Engineer, and have already seen how some of these concepts are applied in the design of the tunnels, and the systems that are at play within the tunnels. I plan to continue my career within transportation, where I will use these concepts on a daily basis whether it be inspecting the tunnels, or understanding the considerations for proper design.

I spent roughly 4 hours on the test, and most of that time was spent reviewing concepts and double checking my work. I did not include the break time in this amount. I would like to dedicate more time to studying and internalizing concepts better beforehand so that I can spend less time on the next one. This is because I did not anticipate spending that amount of time and I would like to be more efficient with my work.