

Test 1 Reflection

1. How and why the test demonstrates your work toward one, or more, of the course learning objectives. Be specific on the course objectives you decide to mention.
 - a. Test 1 for the MET330 class at Old Dominion University demonstrates work towards 3 of the 9 class objectives. These objectives are: 1. Describing the nature of fluids and defining different fluid properties such as viscosity and pressure. 2. Computing pressure and the forces (magnitude, location, and direction) associated with it in a stagnant fluid. 3. Discussing what buoyancy is and determining object stability while floating or submerged in a fluid. The test goes over the first objective in problem 1 by making the student find properties such as specific gravity and specific weight to determine pressure in a manometer. It goes over the second objective when students are required to use certain fluid properties to help figure out net forces and the location of said forces along a wall, support, and hinge. Lastly, the test goes over objective 3 when students are required to determine the stability of a cylinder using the center of gravity, center of buoyancy, and the metacenter locations.
2. How your test compares against the available solution. State the mistakes you made and what you will do next time to avoid making same mistakes. Please point out exactly where you made the mistake, say why you made the mistake, and how you should have done it. If you were taking this test again, what advice would you give yourself to ensure that you had a successful test?
 - a. Problem 1:
 - i. For the first part of problem 1, I achieved the correct answer. However, the second part of the problem, I did not correctly determine the height of the last two fluids before pressure point B. This caused my part b answer to be wrong per the solution. I did however, still set up the formula correctly.
 - ii. Avoiding this same mistake would be to ensure I determine the height of the fluid correctly prior to writing the formula down. The way I should have done it was to subtract two inches from the mercury before point B instead of adding two inches. This error also caused the water height to be off two inches as well.
 - b. Problem 2:
 - i. It's hard to see what the correct answer is here because of the graph and the large range in between cell values but I believe I set up the

formulas correctly here using the examples provided in the book, both in the chapter readings and the practice problems. I didn't draw a free-body diagram of the support which I know will be a deduction on points and I didn't set up the graph correctly. I gave 10 data entry points with a different value(s) for the fluid on the right since that's what the problem states (not the fluid on the left). So, while my graph may not be entirely correct, it had the right foundation.

- ii. Avoiding this same mistake would be to set up free-body diagrams correctly to ensure I'm grasping all formulas required for the problem. Another necessity to ensure accuracy of the graph would be to have multiple data entry points for every "height" instead of doing what I did and have 10 data entry points at a certain incremental value. In this case, 0.1m versus the solution 0.5m.
- c. Problem 3:
 - i. For problem 3, I didn't graph the excel spreadsheet correctly for this one as it was similar to problem 2. I didn't graph three different lines for three different diameters. I only had two lines for 10 different data entry points. The formula creations however were correct so that's a plus in this regard but point deductions will still be taken off.
 - ii. Avoiding this same mistake would be to remember from here on out that when asked for a graph of different values, it's separate "graphing lines" instead of one line.
- 3. What your grade should be. Base it on the writing rubric provided in the test and the correctness of your solution. What are the strengths and weaknesses of your test?
 - a. Problem 1:
 - i. 4.5/6
 - 1. -1 for not considering the correct fluid levels for all fluids after oil column goes to 5"
 - 2. -0.5 due to having part A correct but part B incorrect on final pressure
 - b. Problem 2:
 - i. 5/7
 - 1. -1 for incorrect setup of excel spreadsheet
 - 2. -1 for incorrect final plots
 - c. Problem 3:
 - i. 5/7
 - 1. -1 for incorrect setup of excel spreadsheet

2. -1 for incorrect final plots

- d. Total Grade = $(90/3) * (4.5/6 + 5/7 + 5/7) = 65.4 + 10 \text{ HW points} = 75.4$ for Test 1
- e. Strengths for Test 1 was setting up the formulas correctly and using the correct units. Weaknesses were the excel spreadsheet setup and incorrect plots.

4. Discuss the following:

- a. What issues did you encounter in completing the test? How did you troubleshoot them?
 - i. The only issue I encountered was determining the fluid levels in problem 1.
- b. What steps did you take to complete the whole test? Would you change something?
 - i. I broke it up into 3 nights. One problem each night. I don't think I would change that.
- c. What new concepts have you learned?
 - i. Breaking up problems is a good step to ensure you're really grasping the material and learning. I've also learned Excel is much more powerful than we give it credit for.
- d. Where do you think engineers use those concepts (provide specific examples)?
 - i. Engineers use these concepts for determining flow, pressure drops, calibrations, and leak testing.
- e. Where do you think you will be using everything you learned?
 - i. I'm not sure I will use any of these practices in my field of engineering (automotive design), but it's still good to learn!
- f. Do you think what you learn is important for your professional career?
 - i. Could things change and I change fields from automotive design to calibration, it's quite possible. The honest answer is everything you learn is important even when you think it isn't.
- g. How, when, where and why you might use this information or skill in the future?
 - i. While I may not use these exact formulas, I may use pressure/force/specific gravity/specific weights in the future for material selections/etc in our designs.
- h. Have you been able to apply concepts you have learned in the course to what you do at work or in other courses?

Dylan Arnold
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Test 1 Reflection
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Professor Ayala
University ID: 01166349

- i. As of right now, I have not applied what I've learned in this course to my current job. We did use pressure/forces in thermodynamics and dynamics.
- i. What areas did you feel you were most successful, or improved the most?
 - i. I feel most successful in setting up the problem and ensuring the formulas are correct. What I need to improve on is the excel spreadsheet setup.
- j. How do you see this course's content intersecting with your field or career?
 - i. As mentioned above, I don't see this exactly fitting in with what I do right now, but it's very possible to use it for other applications in the engineering field.
- k. How much time did you spend on the test? How was the time organized? What would you do differently? Why?
 - i. I spent roughly 9-10 hours on the test. This was a combined 2-3 hours per night (three nights). I don't believe I would change this method because it helped me not be too overwhelmed with the entire test. Breaking it up helped me feel more accomplished with each problem I completed.