Test 2 Reflection

The ideal purpose of this test is challenging engineers to solve industrial problems when dealing with the fluid flow once it flows into a pipe. The test also helps engineers compute the pressure, forces, and buoyancy applied within the fluid while in motion.

In part a of this test, there are some significant issues when solving this particular problem. I am having trouble understanding what exactly I am supposed to be unraveling and finding the given information. For instance, I solved only the depth of 0.9*h while neglecting the weight of a partially submerged spherical object at the surface of the gasoline fluid and using the buoyant force equation to determine its depth. I did not consider using the height of the pipe given in Test 1 and then plugging it to find the depth of 0.9*h. For the buoyancy force equation, I struggled to determine the right forces acting on the tank while neglecting the partially submerged object. I should've done differently by using the momentum equation instead of the similar equation used in some of the buoyancy problems during class to find the gasoline fluid's buoyant force.

For part b, I understood more about how to solve the gasoline fluid flowing through the pipe to the gate valve using the buoyant force equation. However, I did not consider using the reactive forces when solving the x and y forces. Instead, I used only the buoyancy force of a submerged object equation.

For part c, I made a mistake in using the pressure loss equation similar to what was used in the first test. I didn't consider using the flow rate equation because I needed to figure out if I had enough information to use this equation.

In part d, when solving the problem, I used the equation for solving velocity (V) instead of the equation for solving flow rate (Q). I am also having difficulty determining the trapezoidal's cross-section slope and area. When I solved for the slope (S), I thought it was a wrong answer when using the equation, so I used the x and y value slope found in the geometric trapezoid, but it turned out to be the given slope of 0.001. For the area of the cross-section, I used T = 2.309y as the width and y as the length. I should have used the given area found within table 14.3 without using any calculations.

For part e, many questions were asked in this section, making it difficult to determine how the answer to each question is being addressed. For cavitation found within the pipe, I assumed the location where the cavitation would occur based on the fluid's behavior as it flows through the pipe after the valve is closed. I did not consider doing the calculations of the water hammer that helps verify that cavitation will likely occur. For the thickness of the wall, I used the equation for finding the pipe thickness and the necessary information in the textbook. However, I should have

included the right max pressure appropriate for this equation and used the elasticity bulk of steel found instead.

In part f, I used the wrong drag coefficient and used the friction coefficient to solve for the drag force. After finding the drag force, I did not calculate the weight of the fluid flow drag using the friction force used to solve the problem. For finding the y-value for 0.1 and 0.5, I had difficulty solving the value because I needed to know that the y-value was founded from part e, which made some massive misconceptions in solving the problem.

If I have to retake this test, I will use excel first and make a list of given information found in the problem before solving each part of the problem to make it more precise and understandable to solve. I will also make sure to use excel for each equation to determine whether it is correct or incorrect before writing it down on paper to make it simpler to use the information found in each part.

For the overall grade for this test, I would give myself a 43.5. The reason for this grade is that I am still having trouble tackling what precisely the client wants to know for each question connecting to one massive problem. There are some equations that I have yet to consider when solving each part of the problem, which made it difficult to get a passive score on this test. The massive difficulty when taking is determining the correct information used to solve the problem from test 1 or the given problem in each part. I also need to include the procedure for this test, and I'll check all the writing requirements before submitting the next test.