Test 2 reflection

This test demonstrates the topic study in an open channel, forces due to static fluids, buoyancy, stability, drag force, impulse theorem, instrumentation, and water hammer. The first thing I noticed that I did differently is units I did everything in the English unit, but the solution is in SI. For (a) the question is related to open channel. For this question’s overall procedure and calculation, I feel that I did it correctly, but my mistake was stopping the calculation at 1.85% where I should have to keep going to less than 1%. For (b) my free body diagram is different, instead of the whole pipe, I only focused on the elbow, but the overall procedure was good. For (c) because the depth I got from part (a) was off it also made my answer here off as well. For (d), the overall procedure is correct, not sure if some numbers were off. For (e) maybe I did the conversion wrong which could be the reason for my result. For (f) I got the right equation, but I noticed the solution did the process twice and I only did it once. For (g) the solution shows that pressure was calculated again using Bernoulli’s but I just used the pressure found from part (b).

WRITING RUBRIC (Applied to the whole test, not to particular problems)

1. Purpose                                              0.5/10.0
2. Drawings                                            1.0/10.0
3. Sources                                               1.0/10.0
4. Design considerations                      1.0/10.0
5. Data and variables                            0.5/10.0
6. Procedure                                          1.5/10.0
7. Calculations                                       1.3/10.0
8. Summary                                            0.3/10.0
9. Materials                                            0.5/10.0
10. Analysis                                              0.5/10.0

**TOTAL                                               8.1/10.0**

PROBLEM 1)

1. Open channel depth (y)
   1. Correct equation                                           1/2
   2. Area and Hydraulic radius                           0.8/2
2. Pipe-elbow forces
   1. Free body diagram and correct forces        0.8/3
   2. Force in x                                                       0.8/3
   3. Force in y (weight)                                       0.8/3
3. Largest wood log
   1. Size                                                                 0.8/2
   2. Stable?                                                            1/2
4. Flow-nozzle flowmeter pressure drop
   1. Right equation and A1/A2                           0.8/2
   2. C value                                                            1/2
5. Water hammer pressure increase
   1. Wave velocity (units?)                                  0.7/2
   2. Pressure increase                                          0.7/2
6. Drag force on a stuck log
   1. Correct area                                                   0.7/3
   2. Correct velocity                                             0.7/3
   3. How Cd was obtained?                                 0.7/3
7. Force on the flange
   1. Magnitude                                                      0.8/2
   2. Location                                                         0.8/2
8. Final actual values of the results                             0.8/1

FINAL GRADE:

**10.0+ (80/10)\*(1.8/2 + 2.4/3 + 1.8/2 + 1.8/2 + 1.4/2 + 2.1/3 + 1.6/2 + 0.8/1) = 62**