

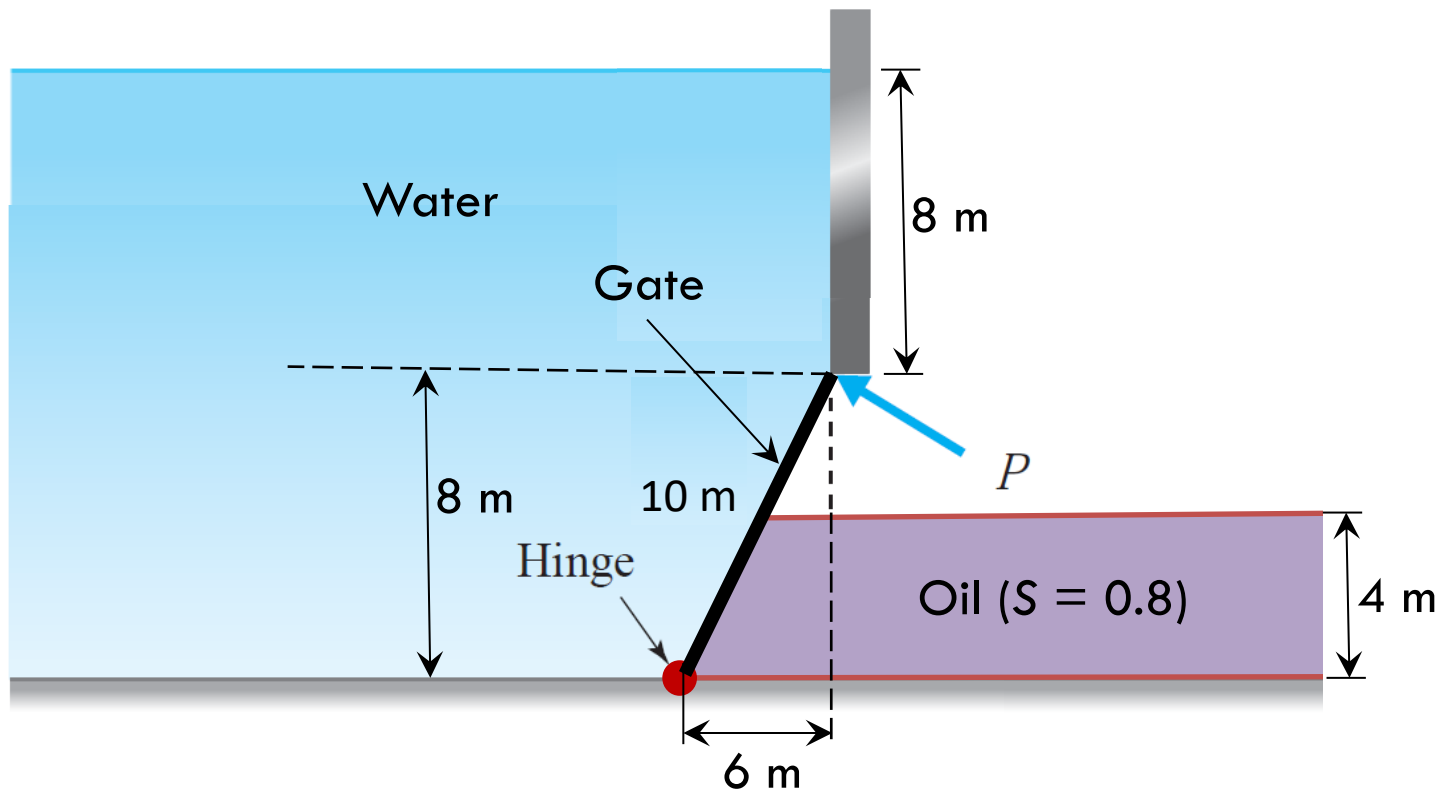
Florida International University
CWR 3201 Fluid Mechanics, Fall 2021
Mid-term # 1

Instructor: Arturo S. Leon, Ph.D., P.E., D.WRE

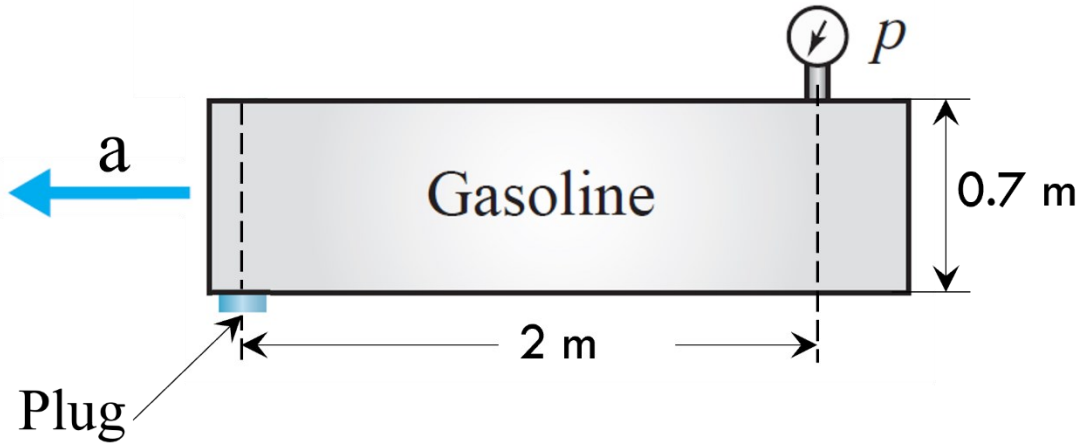
Student Name: _____ **Panther ID:** _____

✓ You will have 50 minutes to complete the exam. The exam is closed book and closed notes.
Only one page (front and back) with handwritten equations are allowed

1. **(35 points)** Determine the force “ P ” needed to hold the 4-m wide gate in the position shown below.



2. (30 points) The gasoline tank below, with an initial pressure of $p = 45$ kPa, is accelerated to the left at a rate of 12 m/s^2 . What is the force on the 3-cm-diameter plug shown below? The density of gasoline is 680 kg/m^3 ($S = 0.68$).



3. (35 points) For the flow shown below, relative to a fixed reference frame, find the acceleration of a fluid particle at Point A. **The sprinkler arm is horizontal.** **Hint:** Make sure your coordinate system follows the **right-hand rule**.

PLAN VIEW of SPRINKLER

