INC 481,693 Dynamics System Modeling **Homework 1**
Assign: 16 Aug 2016 **Due: 23 Aug 2016**

Instruction: Hand in your work with name and code by hand before the class is started. DO NOT copy homework from your classmates or lend it to others. Anyone who violates this regulation will be given -10 for the homework.

1. The fluid in the conical tank shown here has density ρ. The pressure at the bottom of the tank is P , and the height of the fluid in the tank is h. . (10 points)

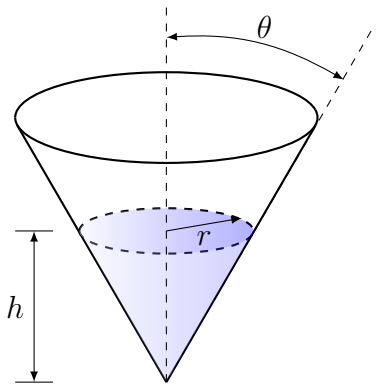

Figure 1: a spherical fluid reservoir

(a) Find the constitutive equation that relates the pressure P to the volume V of fluid in the tank.

(b) Find a expression for the potential energy due to the volume of fluid stored in the tank.