**Hydrostatic Equilibrium Worksheet**

1) The pressure P at various depths h of a fluid in a graduated cylinder is described by where g is the acceleration of gravity. Thus the differential pressure, the amount of pressure above atmospheric pressure P0 due to the fluid, is described by . Indicate which labeled curve or line correctly describes the differential pressure how the differential pressure P-P0 increases with depth h for a graduated cylinder filled with …

**B**

**C**

\_\_C\_\_ pure water on Earth

**A**

**E**

**D**

0

0

Depth h

P-P0

\_\_\_\_\_ pure saltwater (ρsaltwater= 1.3) on Earth

\_\_\_\_\_ pure water on a planet with lower gravity

\_\_\_\_\_ water/karo syrup gradient on Earth

2) Two tall graduated cylinders are shown below. The cylinder on the left contains pure water ρwater= 1.0 g/cm3. The cylinder on the right is nearly half full of Karo syrup ρkaro= 1.33 g/cm3, water is added, and then the two are partially mixed creating a density gradient from top to bottom.

a) For the cylinder on the left, the pressure is Pα at the depth indicated.

-- Indicate with a labeled arrow where the pressure 2Pα?

-- Indicate with an arrow where the density ρ is 1.25 g/cm3.

b) For the cylinder on the right, the pressure is PB at the depth indicated.

-- Indicate with a labeled arrow where the pressure 2Pβ?

-- Indicate with an arrow where the density ρ is 1.25 g/cm3.

Pβ

Pα