CHEN.3030 Fluid Mechanics

II. Static Fluids + Buoyancy

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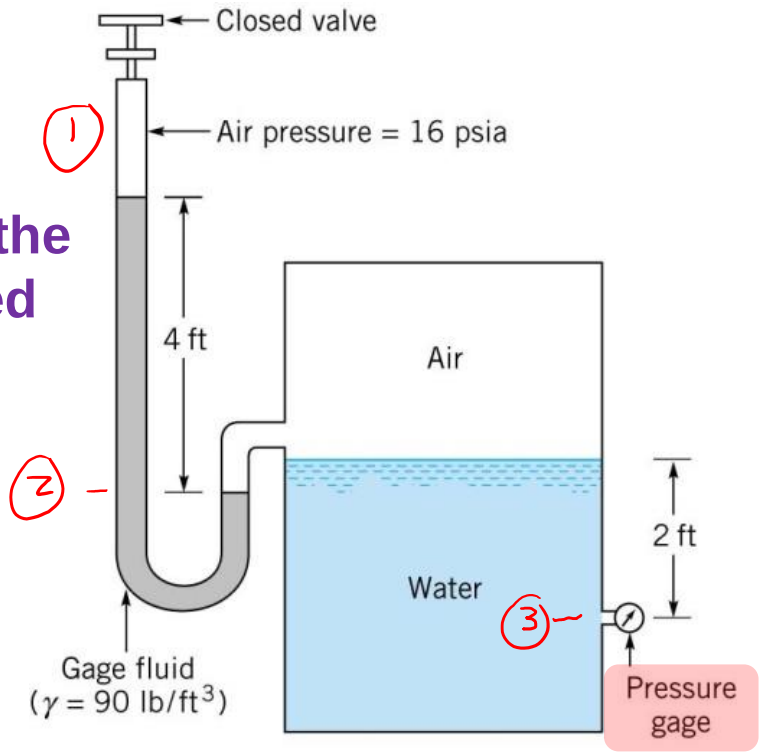
See Chapter 2 (sections 1–6,11) in your text by Hibbeler

Fluid Statics Example #1

Consider the tank and manometer configuration given in the diagram.

Determine the gage pressure near the bottom of the tank at the highlighted location.

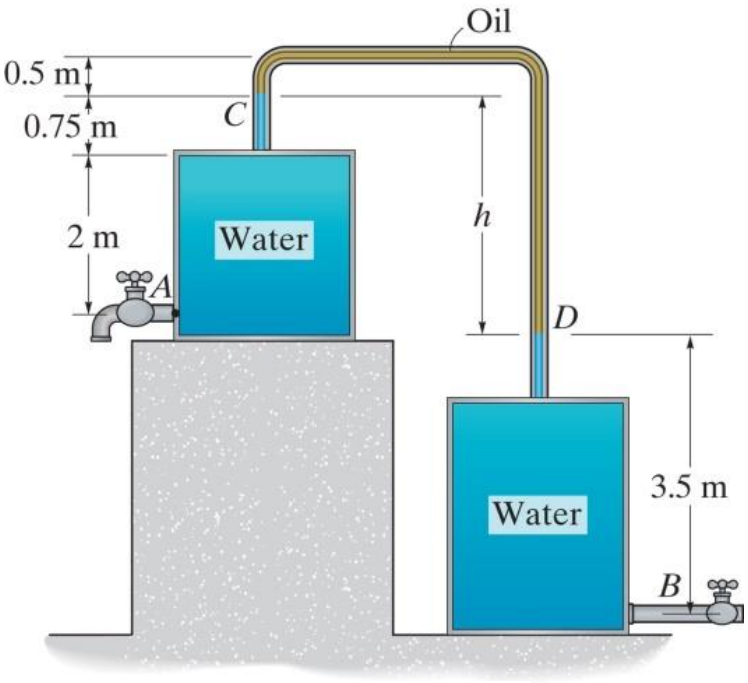


Fluid Statics Example #2

The pressure in the tank at closed valve A is 300 kPa.

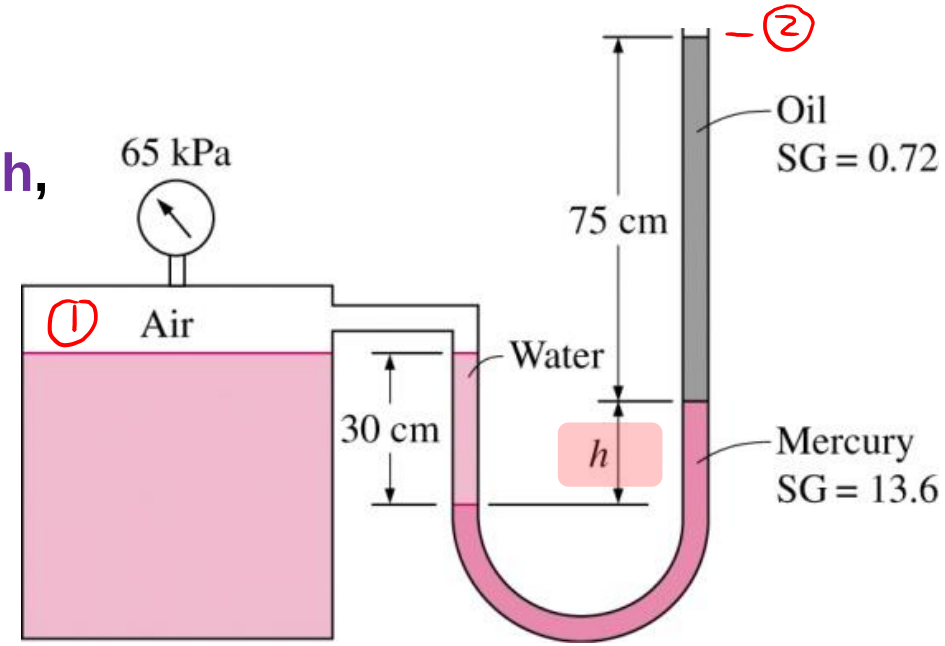
If the differential elevation in the oil level is h = 2.5 m, determine the pressure at closed valve B.

The density of the oil is 900 kg/m^3.



Fluid Statics Example #3

For the system shown in the sketch, determine the height, h, of the mercury column.



Buoyancy Example #1

A hydrometer is a device for measuring the specific gravity of liquids.

For the specific design shown, the bottom hollow cylinder has a 1 in diameter and the top tube has a 0.25 in diameter. The empty hydrometer weighs 0.02 lbf.

What weight of steel shot is needed to make the hydrometer float in the position shown in fresh water (with a specific gravity of 1.0)?