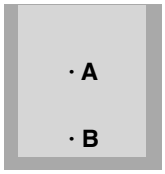
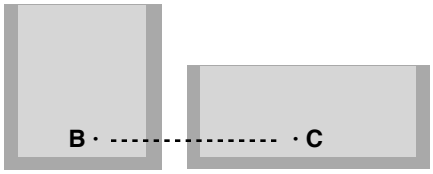
PhyzJob: Liquid Pressure

1. A vessel is filled with water to a certain depth. Consider points A and B at different depths. Compare the pressures.

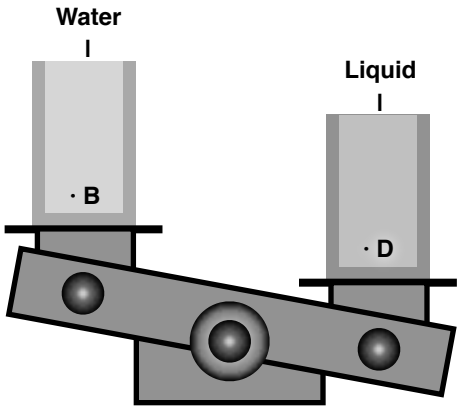


Pressure: __A > B __A = B __B > A

2. A second vessel is filled with the ***same*** volume of water. Compare the pressures at B and C. Defend your answer.



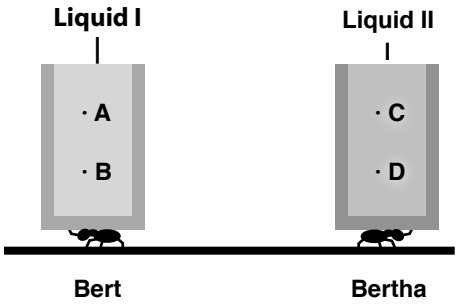
3. A third vessel is filled with the same volume of a ***different*** liquid. The vessels are set on opposite pans of an equal arm balance.



a. How does the density of the different liquid compare to that of water?

b. Compare the pressures at points B and D, which are at ***equal depths*** in their respective liquid.

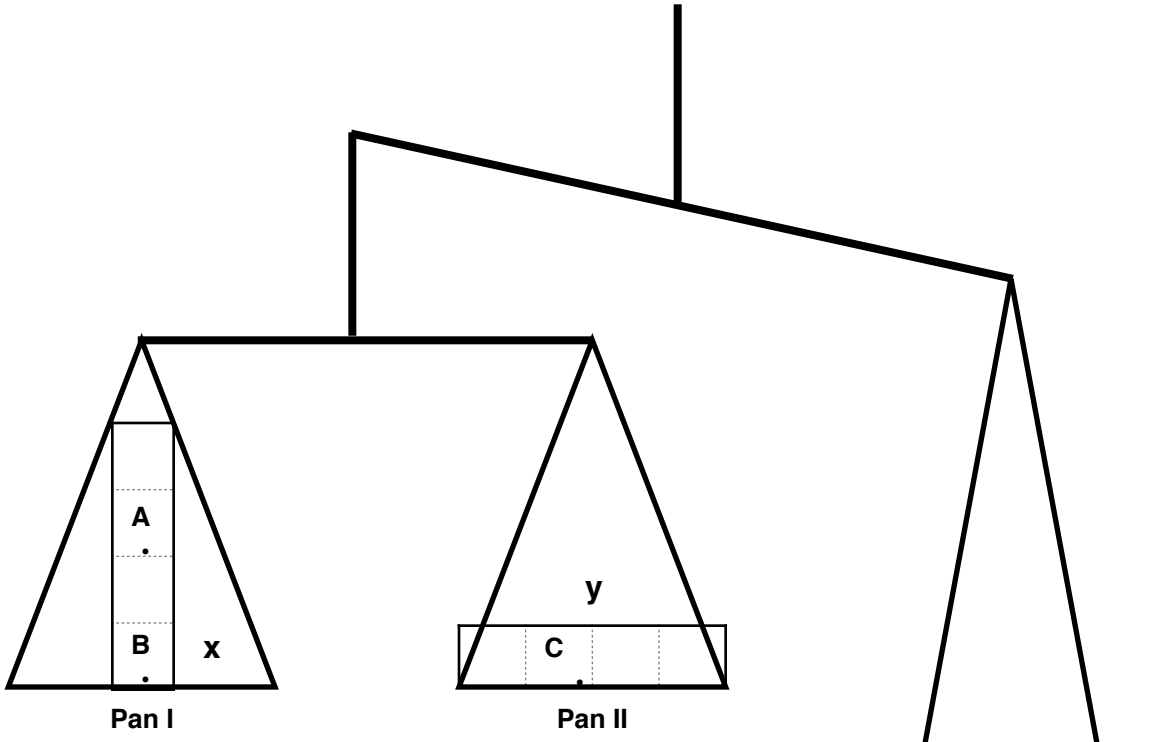
4. Two identical vessels are filled with different liquids. Suppose Liquid II has exactly twice the density of Liquid I.



a. Which ant feels more pressure, Bert or Bertha? Or is it the same for both? Explain.

Point B is at twice the depth of Point A; Point D is at twice the depth of Point C. Points A and C are at the same depth; points B and D are at the same level.

b. Rank the pressures at points A, B, C, and D. Use the symbols > and = where appropriate; **do not use <.**



6. A compound balance is made with beams and pans of negligible mass. Masseless vessels, x, y, and z have the same volume.

Volume: x = y = z

As shown, the loads in pans I and II are in balance with each other, while pans I and II combined weigh less than the load in pan III.

a. Rank the masses of the filled vessels x, y, and z:

Mass:

b. Rank the densities of the liquids x, y, and z:

Density:

Suppose pans I and II were replaced with a single pan, IV, and a vessel (w) with a volume identical to that of all the other vessels. Vessel w is filled with liquid twice as dense as the one in vessels x and y.

c. How would the weight of w compare to that of z?

7. In the original arrangement shown above, rank the pressures at points A, B, C, D, and E. Note: there are two points whose superiority/inferiority cannot be determined. Instead of a “>” symbol between these two, use a “?” mark.

Pressure: