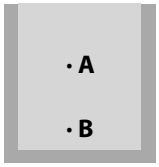
PhyzJob: Liquid Pressure

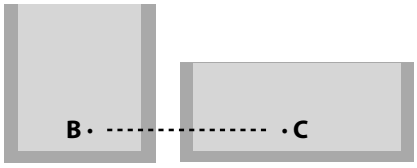
Felix

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



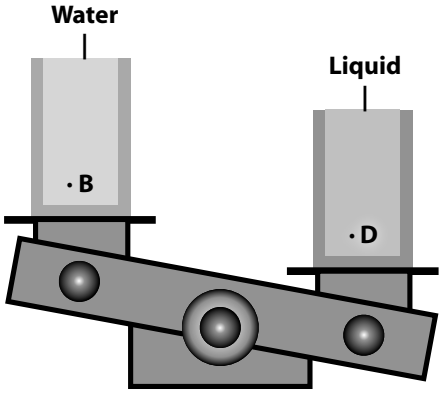
Pressure: __A > B __A = B √B > A

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



B > C because B is at greater depth.

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.



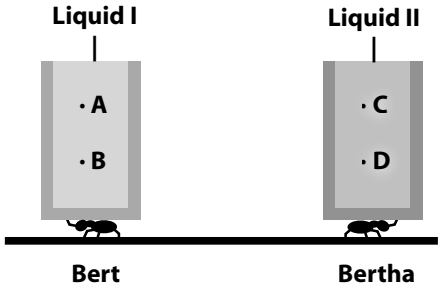
a. How does the density of different liquid compare to that of water?

It is GREATER.

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

D > B

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.

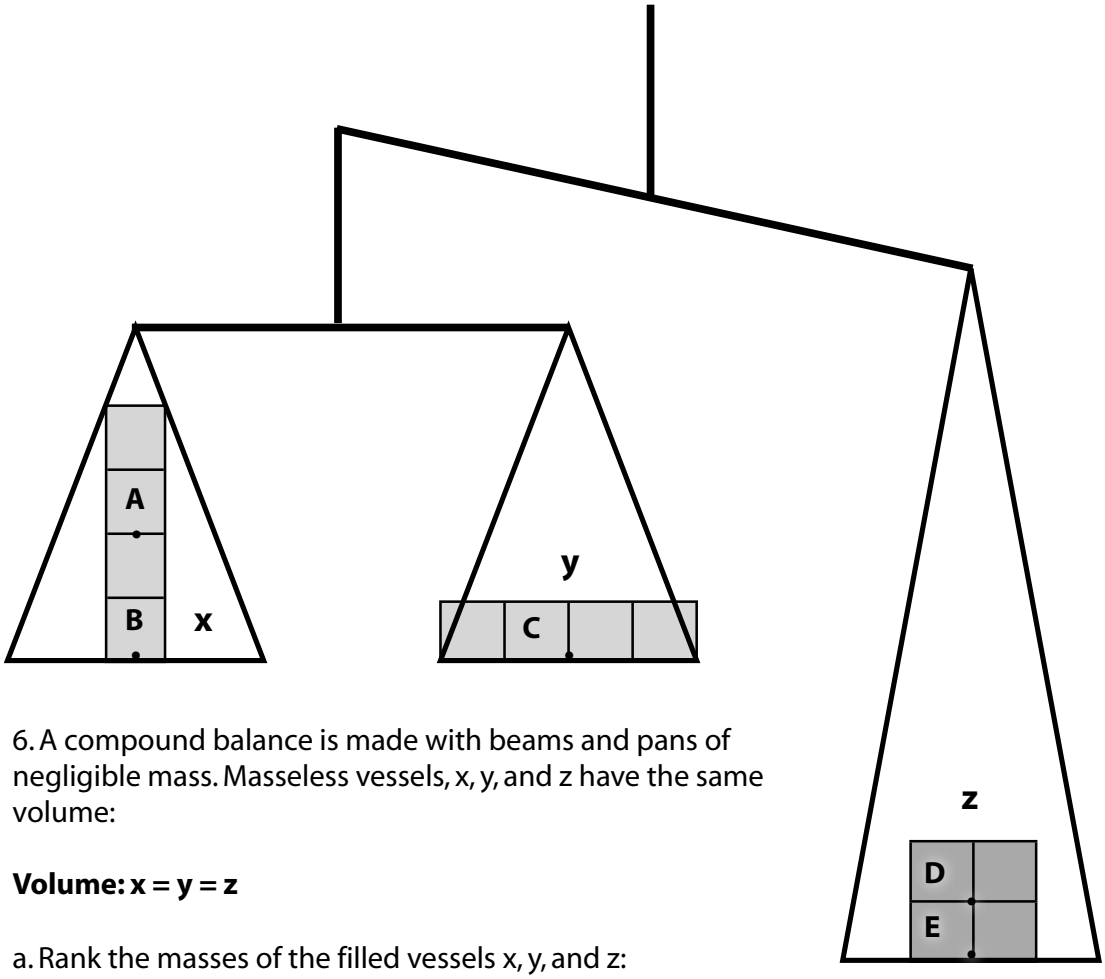
Bertha, since her load (liquid) is heavier at the same volume.

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 > and = where appropriate; do not use <.)

D > C = B > A

∀.p.d. D > C = B > ∀



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

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

Mass: z > x = y (z > y = x)

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

Density: z > x = y (z > y = x)

Suppose pans x and y were replaced with a single pan, w, and a vessel 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?

z > w (w < z)

7. In the arrangement shown above, rank the pressures at points A, B, C, D, and E,

Pressure: E > D > B > A > C

E > D > B > A > C