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(12.03) - Pressure Worksheet

- 1. The density of saltwater in the Dead Sea is higher than that of fresh water (1,240 kg/m<sup>3</sup>), which makes it easier for boats to float.
  - a. What would be the water pressure 30 m below sea level?
  - b. At what depth, below sea level, would a pressure of 90 kPa exist?
- 2. A swimmer dives 7.0 m below the surface of a pool. If the swimmer's ear drum has a cross-sectional area of  $4.5 \times 10^{-5} \text{ m}^2$ , how much force is exerted on the drum?
- 3. A sheet of paper has dimensions of 21.0 cm x 29.7 cm and lays flat on a horizontal floor. How much force is exerted on the paper by the surrounding air?
- A U-shaped tube is used to hold water. The top-left opening is sealed, while the top-right opening is open to the atmosphere above. Positions A, B and C are labeled and different points throughout the tube. Rank these positions from greatest pressure to least.



- 5. A water tank is built in the shape of a cube with each side length equal to 25 cm, as shown below. The tank is completely filled with water and is placed on a horizontal floor.
  - a. What is the gauge pressure at the bottom of the tank from the water?
  - b. What is the atmospheric pressure at the bottom of the box?
  - c. What is the absolute pressure at the bottom of the box?

