AP Physics 2 - Ch 9 Practice Questions

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The tires of a car support the weight of a stationary car. If one tire has a slow leak, the air pressure within the tire will _____ with time, the surface area between the tire and the road will _____ in time, and the net force the tire exerts on the road will _____ in time. 1) _____
   A) decrease, decrease, decrease
   B) decrease, increase, increase
   C) decrease, increase, decrease
   D) increase, increase, increase
   E) decrease, increase, remain constant

2) An air bubble underwater has the same pressure as that of the water. As the air bubble rises towards the surface (and its temperature remains constant), the volume of the air bubble 2) _____
   A) remains constant.
   B) decreases.
   C) increases.
   D) increase or decrease, depending on the rate it rises.

3) A spherical ball of lead (density 11.3 g/cm^3) is placed in a tub of mercury (density 13.6 g/cm^3). Which answer best describes the result? 3) _____
   A) The lead ball will float with about 83% of its volume above the surface of the mercury.
   B) The lead will sink to the bottom of the mercury.
   C) The lead ball will float with about 17% of its volume above the surface of the mercury.
   D) The lead ball will float with its top exactly even with the surface of the mercury.
   E) none of the above

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

4) If a uniform sphere is compressed to half of its original diameter, its mass remains the same but its density becomes 8 times as great. 4) _____

5) If the hydrostatic pressure at a certain depth in the ocean is 2 atm, the hydrostatic pressure will be 4 atm if you go twice as deep. 5) _____

6) If the gauge pressure at a certain depth in Lake Michigan is 3.5 atmospheres, the absolute pressure at that depth is 4.5 atm. 6) _____

7) A long vertical metal cylinder is filled with oil. If a piston pushes on the top of this cylinder and increases the pressure there by 6,000 Pa, the pressure at the bottom will increase considerably more due to the weight of the oil. 7) _____

8) If you increase the pressure on the surface of a can of water, you will increase the buoyant force on objects placed in that water. 8) _____

9) When an object is floating, the buoyant force on it is just equal to its weight. 9) _____

10) Water flows through a pipe having a varying width. More water flows per second through the wide section than through the narrow section because there is more room for it to flow. 10) _____