Name _____ Class _____ Date _____

Assessment

Fluid Mechanics

Section Quiz: Fluid Pressure

Write the letter of the correct answer in the space provided.

_____ **1.** According to Pascal's Principle, how is applied pressure transmitted to every point in a fluid and to the walls of the container holding the fluid?

a. Pressure decreases toward the container walls.
b. Pressure increases toward the container walls.
c. Pressure is equal and uniform throughout the fluid.
d. Pressure depends on the shape of the container.

_____ **2.** An area of 1.0 m^2 and an area of 1.0 cm^2 have the same atmospheric pressure applied to them. Which of the following statements is correct?

a. The atmospheric force is greater on the 1.0 m^2 area.
b. The atmospheric force is equal for both areas.
c. The atmospheric force is less on the 1.0 m^2 area.
d. Atmospheric force does not depend on pressure or area.

_____ **3.** What force exerts 8.0×10^4 Pa of pressure on an area of 1.0×10^{-2} m^2?

a. 8.0×10^{-6} N
b. 8.0×10^{-2} N
c. 8.0×10^{2} N
d. 8.0×10^{6} N

_____ **4.** What is pressure that depends on depth, fluid density, and free-fall acceleration called?

a. total pressure
b. gauge pressure
c. absolute pressure
d. atmospheric pressure

_____ **5.** A force of 580 N is applied on a 2.0 m^2 piston of a hydraulic lift. If a crate weighing 2900 N is raised, what is the area of the piston beneath the crate?

a. 1.0×10^{-2} m^2
b. 0.40 m^2
c. 2.5 m^2
d. 1.0×10^{1} m^2

_____ **6.** The absolute pressure 20 m beneath the ocean is 3.03×10^5 Pa. Atmospheric pressure above the ocean is 1.01×10^5 Pa. What pressure does the sea water apply?

a. 4.04×10^5 Pa
b. 3.03×10^5 Pa
c. 2.02×10^5 Pa
d. 1.01×10^5 Pa

_____ **7.** The net vertical force due to pressure between two depths within a fluid equals the weight of the fluid between the two depths. This is another way of stating which of the following?

a. Archimedes' principle
b. Newton's second law
c. Pascal's principle
d. the definition of density

_____ **8.** The external pressure crushes a closed vessel when it reaches a depth of 30.0 m in water (ρ_w = 1.00 g/cm^3). Which of the following statements is true if this same container is immersed in mercury (ρ_{Hg} = 13.6 g/cm^3)?

a. It will be crushed at a greater depth in mercury than in water.
b. It will be crushed at the same depth in mercury as in water.
c. It will be crushed at a shallower depth in mercury than in water.
d. It will not be crushed at any depth.

9. The advantage of a hydraulic lift is that a force applied to a small piston allows you to lift an object with a weight much greater than the applied force. However, the smaller piston must be pushed down a farther distance than the larger piston is raised. Use the concepts of mechanical advantage and Pascal's principle to explain why this is.

10. A hydraulic lift consists of two cylindrical pistons, one with a radius of 1.5 m and the other with a radius of 8.0 cm. What force must be applied to the smaller piston if a crate with a mass of 1.5×10^3 kg is to be raised on the larger piston?