

# AP FaStudy: FLUIDS

## Major Players

$\rho$  = density                       $V$  = volume                       $A$  = cross-sectional area                       $v$  = flow speed  
 $P$  = pressure, absolute pressure                       $P_0$  = atmospheric pressure                       $P_G$  = gauge pressure  
 $B$  = buoyant force (a new mechanical force, like friction, tension, weight, drag, and normal)

## Density

$$\rho = m/V$$

## Pressure

$P = F/A$  (pressure is force per unit of area)

## Pressure in fluids

$$P = P_0 + P_G$$

## Pressure increase with depth in a fluid

$$P = P_0 + \rho gh$$

## Buoyant force

$$B = mg = \rho Vg$$

Write the statement found in the gray box (in §9.6):

## Equation of Continuity

$$A_1 v_1 = A_2 v_2$$

## Bernoulli's Equation

$$P_1 + (1/2)\rho v_1^2 + \rho g y_1 = P_2 + (1/2)\rho v_2^2 + \rho g y_2$$

Write the statement found in the gray box (in §9.7):

## **College Physics (Serway & Faughn, 5/e)**

### **Read**

Chapter 9, Sections 3-8

### **Answer**

Ch. 9 MC 4, 5

Ch. 9 CQ 1, 2, 7

### **Solve**

Ch. 9 P 10-11, 15, 20, 21, 26, 32, 34, 38, 40

AP 2002-3. AP 2002b-3?

### **Answers to even-numbered textbook items (odds are in the book)**

Ch. 9

CQ 2. Same strength for both since force on the dam = area x avg. pressure; pressure depends on depth, so same depth means same pressure.

P 10.  $1.9\text{E}+4$  N

P 20. 0.611 kg

P 26. a.  $8570\text{ kg/m}^3$  b.  $714\text{ kg/m}^3$

P 32.  $760\text{ s} = 13\text{ min}$

P 34.  $1.50\text{E}+5$  N upward

P 38. 9.00 cm

P 40. 1.5 cm