Fluids

Book Chapter: 9
Book Pages: pp257-278
Practice Problems: pp294-99; 2, 14, 18, 28
Terms/ Ideas:
Stress
Strain
Young's Modulus
Pascal's Principle
Archimedes principle
Bernoulli's Equation

Equations:
Elastic modulus = stress/strain
$D = m/v$
$P = F/A$
$P = P_0 + Dgh$
$P + 1/2Dv^2 + Dgy = constant$

Free Response:

A large rectangular raft (density 650 kg/m^3) is floating in a lake. The surface area of the top of the raft is 8.2 m^2 and its volume is 1.80 m^3. The density of water is 1.0 g/ml.

a) Calculate the height h of the portion of the raft that is above the water.

b) Calculate the magnitude of the buoyant force if the raft and state its direction.

c) If the average mass of a person is 74 kg, calculate the maximum number of people that can be on the raft without the top of the raft sinking below the water.