CE 3305 Fluid Mechanics
Quiz 2
Spring 2014

1. How are density (ρ) and specific weight (γ) related?[1]

$\gamma = \rho g$

2. If a gas has $\gamma = 15 N/m^3$, what is its density in

a) in SI units?

$\gamma = \rho g \; ; \; \rho = \frac{\gamma}{g} \qquad g = 9.8 m/s^2$

$1N = \frac{1 kg \cdot m}{s^2}$

$\rho = \frac{15N}{m^3} \cdot \frac{1 kg \cdot m/s^2}{1N} \cdot \frac{1}{9.8 m/s^2} = 1.53 kg/m^3$

b) in US customary units?

$1.53 kg/m^3 \cdot \frac{62.43 lbf/ft^3}{1000 kg/m^3} = 0.0951 lbf/ft^3$

3. For the velocity gradient $\frac{dV}{dy}$ which of the following are correct statements?

a) The change in velocity dV is in the direction of flow.

(b) The change in the velocity dV is perpendicular to flow.

NEED TO MOVE UP/DOWN TO DIFFERENT VELOCITY ∴ CHANGE IS PERPINDICU

[1] You do not need to follow problem solving format for these questions, just state the relationship (equation).