

Homework Discussion, Week 12

Physics 1301

Dr. Andersen

Chapter 15

47) Use the continuity equation. Since the density stays the same, $v_1 A_1 = v_2 A_2$.

52) a) The water will flow more slowly in the section of tube with the largest cross-sectional area (again, because of the continuity equation), and thus largest diameter. According to Bernoulli's equation then, $P + 1/2\rho v^2 = \text{constant}$, so if v is lower in a section, then P must be higher, so the pressure must be highest in the larger diameter pipe. b) Already answered in part (a) (I think he should have asked this bit first.) c) Use Bernoulli's equation

$$P_1 + 1/2\rho v_1^2 = P_2 + 1/2\rho v_2^2$$

along with the continuity equation

$$v_1 A_1 = v_2 A_2$$

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Answer: 1.3 m/s