# Answer on Question#37655, Physics, Other

**Question:**

Water is flowing down through the pipe shown in the drawing. Point A is 0.410 m higher than B. The speed of the water at A and B are vA = 5.00 m/s and vB = 2.78 m/s. Determine the difference PB - PA in pressures between B and A. The density of water is 1.00 × 103 kg/m3.

http://edugen.wileyplus.com/edugen/courses/crs3976/art/qb/qu/c11/c11_q_19.gif

**Answer:**

Bernoulli's principle can be expressed as a mathematical equation:

$$\frac{v^2}{2} + gh + \frac{p}{\rho} = const$$

where $v$ is the water streams speed, $g$ is the acceleration due to gravity,

$h$ is the height, $p$ is the pressure, and $\rho$ is the density of the water.

In our case:

$$\frac{v_A^2}{2} + gh_A + \frac{p_A}{\rho} = \frac{v_B^2}{2} + gh_B + \frac{p_B}{\rho}$$

Therefore:

$$p_B - p_A = \rho\left(\frac{v_A^2}{2} - \frac{v_B^2}{2} + g(h_A - h_B)\right) = 12700\ Pa = 12.7\ kPa$$

Answer: $12.7\ kPa$