Name_____

## *Dynamic Fluids and Bernoulli's Equation*

1. Bernoulli's equation for *flowing* fluids is written as:

$$\Delta P + \frac{1}{2}\rho_{fluid}\Delta\left(v^2\right) + \rho_{fluid}g\Delta y = 0.$$

Recall the key to using Bernoulli's equation is choosing 2 points of interest. Once the two points are chosen, the rest is straightforward. The directions that follow are meant to lead you through steps which will help you pick the important points and apply Bernoulli's equation.

Consider a 2.0 L bottle filled all the way to the top with water. Water leaks out of two holes in its side.
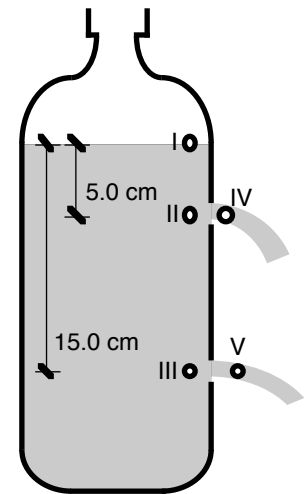
2. What are the absolute pressures P_I, P_{II}, and P_{III}?

3. Explain in words why the pressures P_{IV} and P_V are actually at atmospheric pressure. (Hint: what would happen if the pressures inside each stream were much higher than 101,000 Pa?)

4. Use Bernoulli's equation to calculate the velocities of the water streams just as they leak out of the two holes.

5. Do your velocities in (4) seem reasonable? Are they over- or underestimated? Explain what causes this over- or underestimation.