For a nice visualization of Bernoulli's principle and some applications see the following video: principle.https://www.youtube.com/watch?v=DW4rItB20h4

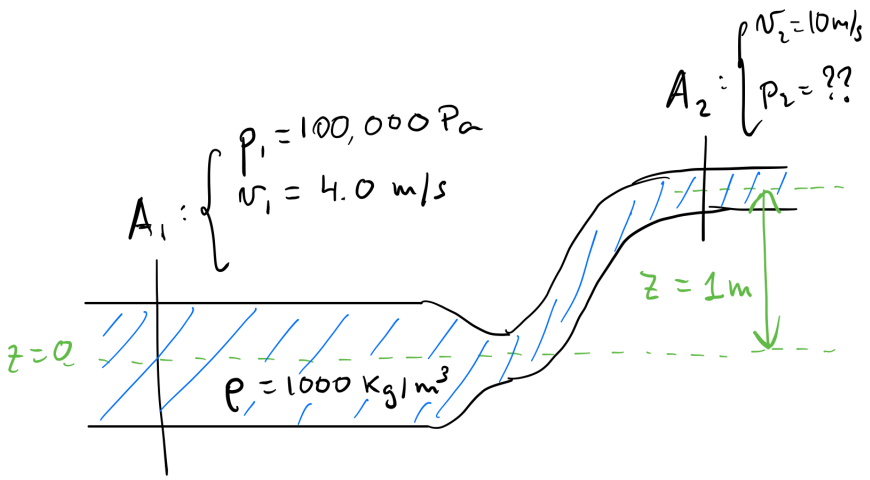
1. Use thesimulator in https://www.ophysics.com/fl2.html to answer the following questions:

   a) What happens to the velocity and pressure if we change the area of the pipe without changing the height?

   b) What happens to the velocity and pressure if we change the height without changing the area?

   b) Can you get the pressure to be the same (or approximately the same) in both points by changing the height and the area? (You can't leave the pipe unchanged). Upload a screenshot of the configuration that achieved so.

2. Suppose we have liquid flowing through a pipe that obeys Bernoulli's principle. We know that $\rho\frac{v^2}{2} + \rho g z + p$ is a constant along the flow (where ρ is the density of the fluid, v its velocity, p is the pressure, z is the height of the pipe and $g = 9.8\ m/s^2$). This means that the sum all those three terms must be the same at every cross section of the pipe. Given the information in the figure below, find out what is the pressure at A_2.



3. Apply the continuity equation and calculate by how much the area A_2 has narrowed down with respect to A_1. (Hint: you have to calculate A_2/A_1)

4. The following questions correspond to the video on the impact of coastal defences on flood risk. You will have to watch the following video
https://www.youtube.com/watch?v=3yNoy4H2Z-o

a) Why is a wave tank a useful tool?

b) Does adding a slope in front of the vertical wall improve protection?

c) Which structure dissipates more the energy of the waves?

d) What is the disadvantage of a submerged near-shore breakwater?

e) In the end which structures performed better to prevent flooding?

5. Demonstrate the lift of an airfoil due to Bernoulli's principle. The principle tells us that when we increase the velocity of the fluid (air) above the airfoil, that causes the pressure there to fall. The difference in pressure above and below the airfoil will cause the lifting force. Note that we don't want the airfoil to lift by blowing air from below! That will work too, but not due to Bernoulli's principle. Upload a short clip of the demonstration. You can use a piece of paper to simulate the airfoil. The air source can be a hand dryer, small fan, you blowing air,.. The more realistic you can make it the better. Explain how is Bernoulli's principle being applied in your demonstration
   Here you have a couple of examples on how to do so:
   https://www.youtube.com/watch?v=ufeky6EIXQ4
   https://www.youtube.com/watch?v=jvJW2OXqrjQ
   https://www.youtube.com/watch?v=5zD7Le2mGFg