

Planet Holloway **websheet 9.2**

AP Physics 2 - Chapter 9 Fluids

You may print this out and write on it or work on your own paper.

Show all work.

1. Water flows through a pipe (radius 0.03 m) at 12 m/s. The pipe goes up to the third floor of the building, 5.5 m higher, and the pressure remains unchanged. What is the speed of the water on the third floor?
2. A hole is poked in a rain barrel 35 cm below the surface. What is the initial speed of the water leaving the hole?
3. A small plane with a mass of 3 000 kg is being flown by penguins. If the total area of the wings is 35 m^2 , what is the pressure difference between the top and bottom of the wings during flight?
4. Water is sent from a fire hose at 38 m/s at an angle of 53 degrees from horizontal. What is the maximum height the water will reach?
5. If the pressure inside a commercial airliner (being flown by penguins) is maintained at 1 atm, what is the net outward force exerted on a circular window (radius 0.22 m) if the outside pressure is 0.4 atm?
6. A sculptures chisel has an edge area of 0.4 cm^2 . If the chisel is struck with 120 N of force, what is the pressure exerted on the stone she is carving?

Answers:

- | | |
|------------------------|--------------------------|
| 1. 5.83 m/s | 4. 46.05 m |
| 2. 2.65 m/s | 5. 9123.2 N |
| 3. 857 N/m^2 | 6. 3 000 000 Pa or 3 MPa |