

PY211

**Quiz 8**

Your quiz will be graded on the quality of your solutions, i.e. not just on the right answers.  
Please be sure to show all your work for full credit.

(1) A hydraulic press is used to lift heavy objects. It consists of a U-tube, one end having a large cross-sectional area  $A_1$ , the other having a small cross-sectional area  $A_2$ . The tube is filled with an incompressible fluid and the load is placed on  $A_2$ . The load is lifted a distance  $\Delta x_2$  by applying a force to piston  $A_1$ , moving it a distance  $\Delta x_1$ .

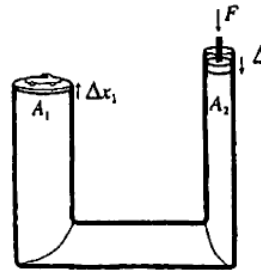
(1-1) If the force applied is  $F_1$ , what load can be lifted?

(a)  $\frac{A_1}{A_2} F_1$

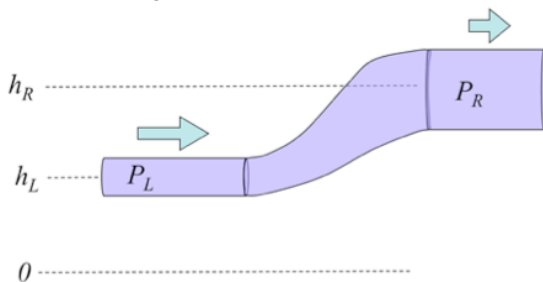
(b)  $\frac{A_2}{A_1} F_1$

(c)  $\left(1 + \frac{A_1}{A_2}\right) F_1$

(d)  $\left(1 + \frac{A_2}{A_1}\right) F_1$



(1-2) Water flows from left to right along a pipe as shown. The right end of the pipe is **twice as high** and also has **four times the area** of the left end. Find the difference in pressure between the left and the right ends of the pipe.



Please rank how sure you are of your answers: Guessed – 1    2    3    4    5 – Very Sure