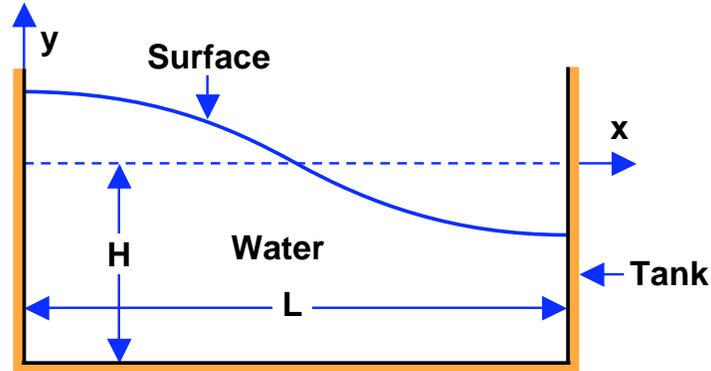


**Problem 130H**

Water is sloshing back and forth in a box of liquid of mean depth,  $H$ , and width,  $L$ , so that standing waves are formed:



Assuming that

- the flow is planar, incompressible, inviscid and irrotational potential flow
- the free surface is devoid of surface tension and is at constant atmospheric pressure
- the surface waves are of **small** amplitude and only linear terms in the free surface boundary condition need be included

find the frequency,  $f$  ( $f = \omega/2\pi$ ), of the lowest mode of sloshing motion (the lowest frequency) in the tank in terms of  $H$ ,  $L$  and the acceleration due to gravity,  $g$ .