Example 9:

A tank of area of $A_t$ is being filled with water by two inlets as shown. Air is trapped at the top of the tank. The water height is $h$ and the tank height is $H$.

(a) Find an expression for the change in height $dh/dt$.

(b) Repeat the problem with the tank open.

**Known:** $H$, $\rho_a$, $\rho_w$, $A_t$, $Q_1$, $Q_2$

**Assumptions:** Incompressible liquid

**Find:** $dh/dt = f(H, \rho_a, \rho_w, A_t, Q_1, Q_2)$

**Solution:**

**Answer:** (a) $dh/dt = (Q_1 + Q_2)/A_t$