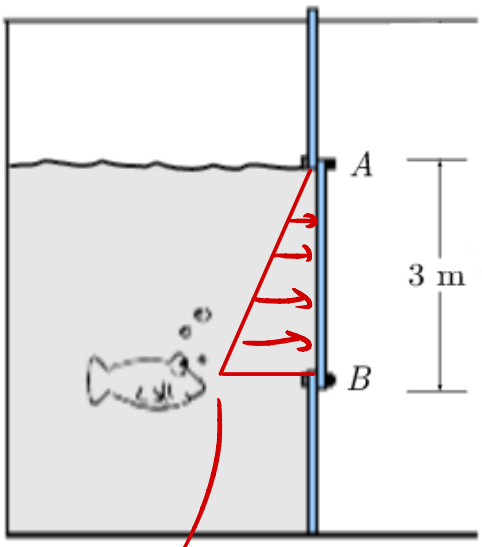
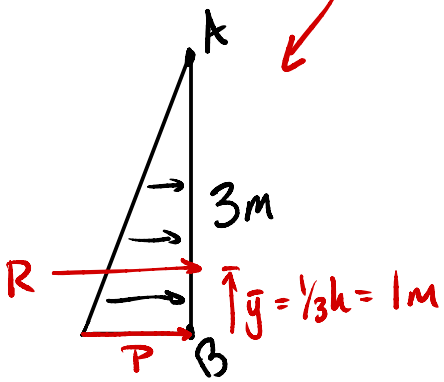
Name: _____ **Section:** _____

AEM 2011 Quiz #8
Tuesday, March 21, 2023

A non-communicating calculator is allowed. Full credit will only be given if all steps used are clearly communicated (free body diagrams, algebra, etc).

An aquarium tank has a $3m \times 1.5m$ window AB for viewing the inhabitants. The tank contains water with a density $\rho = 1000kg/m^3$.
Find the force of the water on the window, and the location of the equivalent point load.





$$P = \rho g h = (1000 kg/m^3)(9.81 m/s^2)(3m)(1.5m)$$

$$= 29{,}430 \, N/m^2$$

$$R = \frac{1}{2} P h w = \frac{1}{2}(29{,}430 N/m^2)(3m)(1.5m) = 66{,}217.5N$$

$\therefore$ $R = 66.2kN \rightarrow$ at $\bar{y} = 1m$ from B (or 2m from A)