A dam has a height $H$ and width $L$.

Find the total force $F$ on the dam.

A) $F = \rho g H (HL)$

B) $F = \frac{1}{2} \rho g H (HL)$

C) $F = \frac{1}{4} \rho g H (HL)$

\[ F = \int_0^H \rho g (H - y) L \, dy. \]

From the integral defined above, one gets $F = \frac{1}{2} \rho g H (HL)$. Intuitive reasoning: The total force equals to the average pressure times the area, where the average pressure is given by the average of 0 and the maximum value.

Answer B.

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