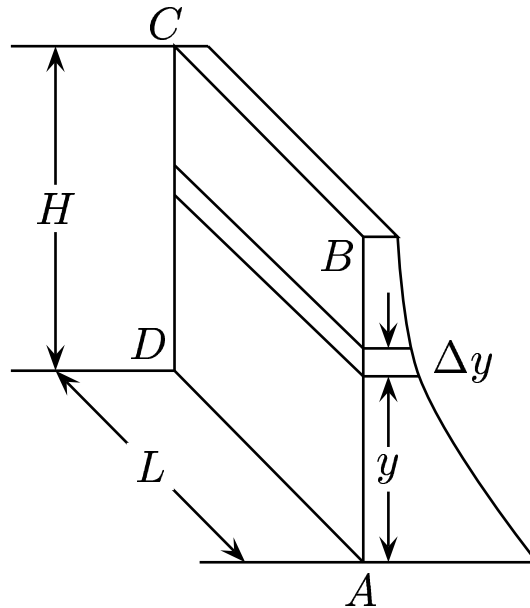


A dam has a height  $H$  and width  $L$ .



Find the total force  $F$  on the dam.

- A)  $F = \rho g H (HL)$
- B)  $F = \frac{1}{2} \rho g H (HL)$
- C)  $F = \frac{1}{4} \rho g H (HL)$

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$$F = \int_0^H \rho g (H - y) L dy.$$

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**.