Assessment 4 Full Name: Tyler Gillette

Version B

Follow the directions on the previous page.

The diagram shows a triangular hatch on a cruise ship with height 9 m and base length 3 m which is positioned vertically in the water (weight density of ocean water = 10,030 N/m^3) so that the top is 2 m above the surface. The base of the hatch is parallel to the surface of the water. The diagram is not necessarily to scale.

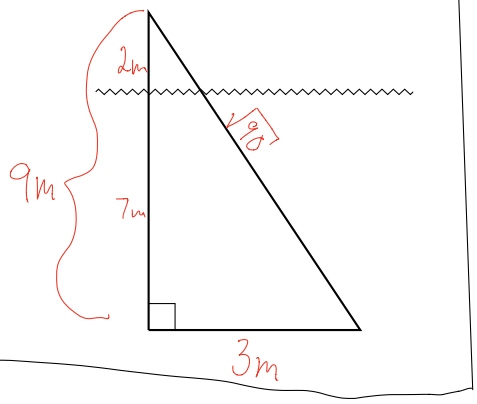
1

$P = \rho g d \quad F = P \cdot A \quad \rho = 10,030\ N/m^3$

$A = \frac{1}{2} b \cdot H \quad A = \frac{27}{2} \quad [2, 9]$

$A = \frac{1}{2} 3 \cdot 7$

$A = \frac{27}{2}$



2

$$\int_{2m}^{9m} (10,030\ N/m^3)(x-2)\left(\frac{27}{2}\ m^2\right) dx$$

$$= 135405\ N/m \int_{2m}^{9m} x - 2\, dx$$

$$= 135405\ N/m \left(\frac{x^2}{2} - 2x\right) \Big|_{2m}^{9m}$$

$$= 135405\ N/m \left(\frac{81}{2} - 18 - 2 + 4\right) m$$

$$= 135405\ N/m \left(\frac{49}{2}\right) m = 3317422.5\ N \quad \surd$$