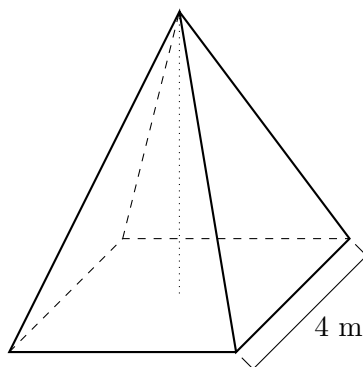


12. [9 points] An oil tank has the shape of a pyramid with a square base of side length 4 meters and height 10 meters. The top of the pyramid lies directly above the center of the base. **Be sure to include units in your answers.** Recall that the gravitational constant is $g = 9.8 \text{ m/s}^2$.



The tank is filled with oil up to a height of 6 meters.

- a. [4 points] Write an expression approximating the mass of a thin horizontal slice of thickness Δy located y meters **below** the top of the tank. The density of the oil is 880 kg/m^3 . Don't forget to include units.
- b. [5 points] Write a definite integral that represents the total amount of work required to pump all of the oil to the top of the tank. Do not evaluate the integral. Don't forget to include units.