**3.** [11 points] During a trip to the local aquarium, Steph becomes curious and decides to taste the fish food. The fish food tank is completely filled with food, and it is in the shape of a pyramid with a vertical hole through its center, illustrated below (the dashed lines are not part of the tank). The tank itself is 3 m tall, and the pyramid base is a square of side length 10 m. The top and bottom of the hole are squares of side length 4 m. The food is contained in the shaded region only, **not** in the hole.



**a.** [5 points] Write an expression that gives the approximate volume of a slice of fish food of thickness  $\Delta h$  meters, h meters from the bottom of the tank.

**b.** [3 points] Suppose that the mass density of fish food is a constant  $\delta$  kg/m<sup>3</sup>. Write, but do **not** evaluate, an expression involving integrals that gives the mass of fish food in the tank.

c. [3 points] Write an expression involving integrals that gives  $\overline{h}$ , the *h*-coordinate of the center of mass of the fish food, where *h* is defined as above. Do **not** evaluate your expression.