

1 Mass of a Slab

Determine the total mass of each of the slabs below.

- (a) A square slab of side length L with thickness h , resting on a table top at $z = 0$, whose mass density is given by

$$\rho = A\pi \sin(\pi z/h). \quad (1)$$

- (b) A square slab of side length L with thickness h , resting on a table top at $z = 0$, whose mass density is given by

$$\rho = 2A\left(\Theta(z) - \Theta(z - h)\right) \quad (2)$$

- (c) An infinitesimally thin square sheet of side length L , resting on a table top at $z = 0$, whose surface density is given by $\sigma = 2Ah$.

- (d) An infinitesimally thin square sheet of side length L , resting on a table top at $z = 0$, whose mass density is given by $\rho = 2Ah \delta(z)$.

- (e) What are the dimensions of A ?

- (f) Write several sentences comparing your answers to the different cases above.