

3. We will refer to the arrangement as a “table.” We locate the coordinate origin at the left end of the tabletop (as shown in Fig. 9-37). With $+x$ rightward and $+y$ upward, then the center of mass of the right leg is at $(x,y) = (+L, -L/2)$, the center of mass of the left leg is at $(x,y) = (0, -L/2)$, and the center of mass of the tabletop is at $(x,y) = (L/2, 0)$.

(a) The x coordinate of the (whole table) center of mass is

$$x_{\text{com}} = \frac{M(+L) + M(0) + 3M(+L/2)}{M + M + 3M} = 0.5L.$$

With $L = 22$ cm, we have $x_{\text{com}} = 11$ cm.

(b) The y coordinate of the (whole table) center of mass is

$$y_{\text{com}} = \frac{M(-L/2) + M(-L/2) + 3M(0)}{M + M + 3M} = -\frac{L}{5},$$

or $y_{\text{com}} = -4.4$ cm.

From the coordinates, we see that the whole table center of mass is a small distance 4.4 cm directly below the middle of the tabletop.