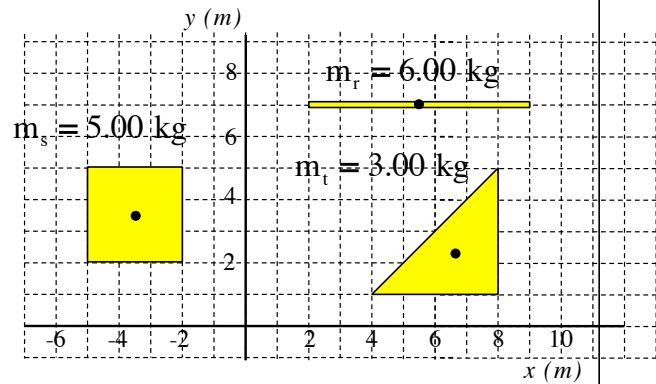


Problem 12.7

Again, the *center of mass* and the *center of gravity* are usually the same point, so we need to find the *center of mass* for each body (we can in most cases eyeball this). With that, we can find the *center of mass* for the whole thing.

I've put a dot at the *center of mass* of each object. Taking the coordinate data right off the graph, the *center of mass* calculations are found on the next page.



1.)

$$\begin{aligned}x_{cg} &= \frac{\sum m_i x_i}{\sum m_i} \\&= \frac{(6.00 \text{ kg})(5.50 \text{ m}) + (3.00 \text{ kg})(6.67 \text{ m}) + (5.00 \text{ kg})(-3.50 \text{ m})}{(6.00 \text{ kg}) + (3.00 \text{ kg}) + (5.00 \text{ kg})} \\&= 2.54 \text{ m}\end{aligned}$$

$$\begin{aligned}y_{cg} &= \frac{\sum m_i y_i}{\sum m_i} \\&= \frac{(6.00 \text{ kg})(7.00 \text{ m}) + (3.00 \text{ kg})(2.33 \text{ m}) + (5.00 \text{ kg})(3.50 \text{ m})}{(6.00 \text{ kg}) + (3.00 \text{ kg}) + (5.00 \text{ kg})} \\&= 4.75 \text{ m}\end{aligned}$$

2.)