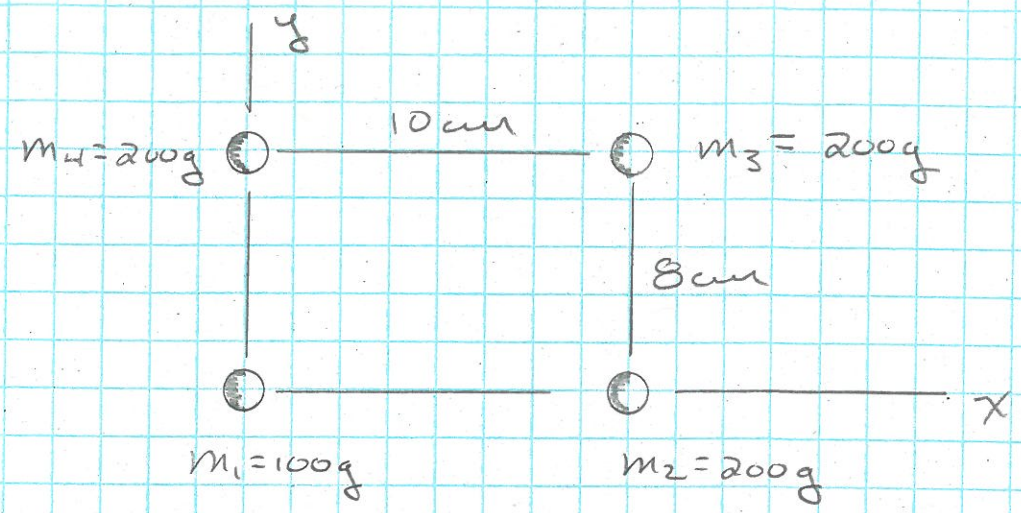

a.) find center of mass:

particle coordinates: (in cm.)

$(x_1, y_1) = (0,0)$; $(x_2, y_2) = (10,0)$

$(x_3, y_3) = (10,8)$; $(x_4, y_4) = (0,8)$

So:

$$x_{CM} = \frac{1}{M}\sum_{i=1}^{4} x_i m_i \qquad M = \sum_{i=1}^{4} m_i = m_1 + m_2 + m_3 + m_4$$

$$= 700\ g.$$

$$= \frac{1}{M}\{x_1 m_1 + x_2 m_2 + x_3 m_3 + x_4 m_4\}$$

$$x_{CM} = \underline{5.714\ cm}$$

and, $$y_{CM} = \frac{1}{M}\sum_{i=1}^{4} x_i m_i$$

$$= \frac{1}{M}\{m_1 y_1 + m_2 y_2 + m_3 y_3 + m_4 y_4\}$$

$$y_{CM} = \underline{4.571\ cm}$$