Name: _____

Class: _____

Due Date: _____

# Physics Topic 7A – Center of Mass

**Answer the following questions. The solutions to this worksheet can be found on the YouTube channel Go Physics Go.**

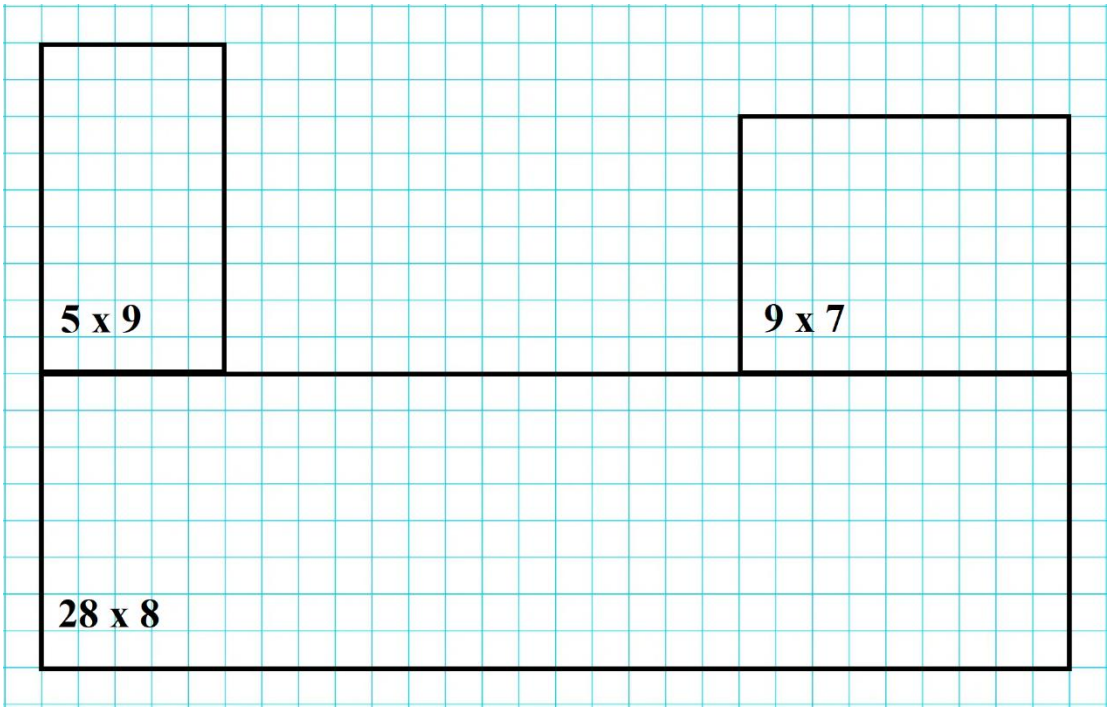
1. E: Use the equation $x_{\text{cm}} = \frac{\sum x_i m_i}{\sum m_i}$ to determine the center of mass of four objects on a horizontal line. Object A has a mass of 1 kg and is located at $x = 3$ m, object B has a mass of 4 kg and is located at $x = 5$ m, object C has a mass of 2 kg and is located at $x = 8$ m, and object D has a mass of 6 kg and is located at $x = 7$ m.

2. E: Use the equation $x_{\text{cm}} = \frac{\sum x_i m_i}{\sum m_i}$ to determine the center of mass of four objects on a horizontal line. Object A has a mass of 2 kg and is located at $x = 4$ m, object B has a mass of 5 kg and is located at $x = 6$ m, object C has a mass of 3 kg and is located at $x = 9$ m, and object D has a mass of 7 kg and is located at $x = 8$ m.

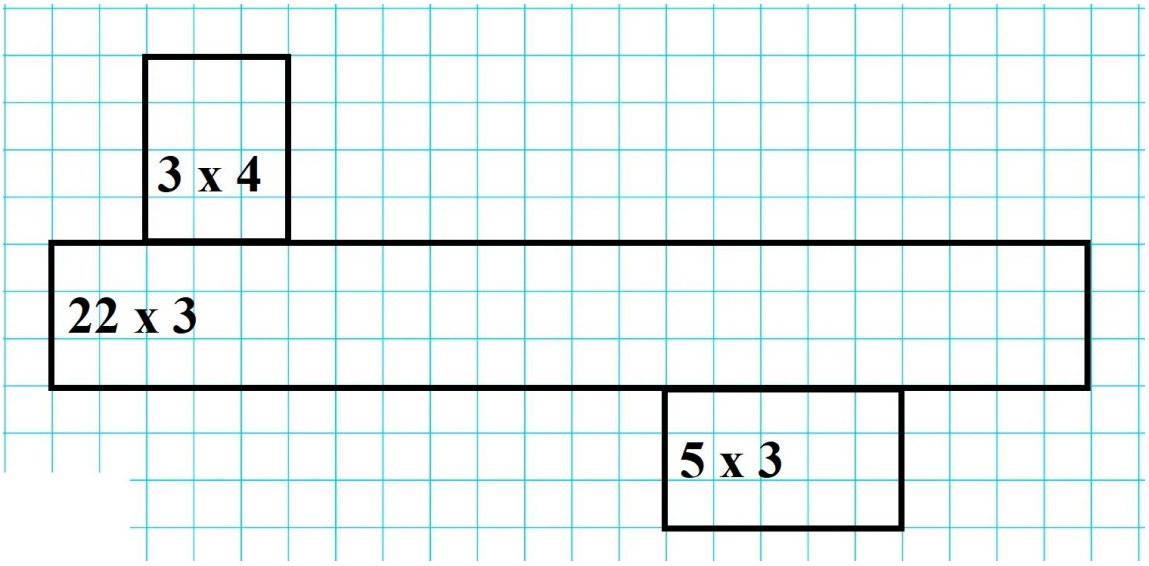
3. E: Use the equation $\left(x_{\text{cm}} = \frac{\sum x_i m_i}{\sum m_i},\ y_{\text{cm}} = \frac{\sum y_i m_i}{\sum m_i}\right)$ to determine the center of mass of four objects on a horizontal plane. Object A has a mass of 1 kg and is located at $(x_1, y_1) = (3\text{ m}, 4\text{ m})$, object B has a mass of 4 kg and is located at $(x_2, y_2) = (-2\text{ m}, -4\text{ m})$, object C has a mass of 2 kg and is located at $(x_3, y_3) = (4\text{ m}, 1\text{ m})$, and object D has a mass of 6 kg and is located at $(x_1, y_1) = (1\text{ m}, -1\text{ m})$.

4. E: Use the equation $\left(x_{\text{cm}} = \frac{\sum x_i m_i}{\sum m_i},\ y_{\text{cm}} = \frac{\sum y_i m_i}{\sum m_i}\right)$ to determine the center of mass of four objects on a horizontal plane. Object A has a mass of 3 kg and is located at $(x_1, y_1) = (3\text{ m}, 3\text{ m})$, object B has a mass of 6 kg and is located at $(x_2, y_2) = (-2\text{ m}, -5\text{ m})$, object C has a mass of 4 kg and is located at $(x_3, y_3) = (4\text{ m}, 0\text{ m})$, and object D has a mass of 8 kg and is located at $(x_1, y_1) = (1\text{ m}, -2\text{ m})$.

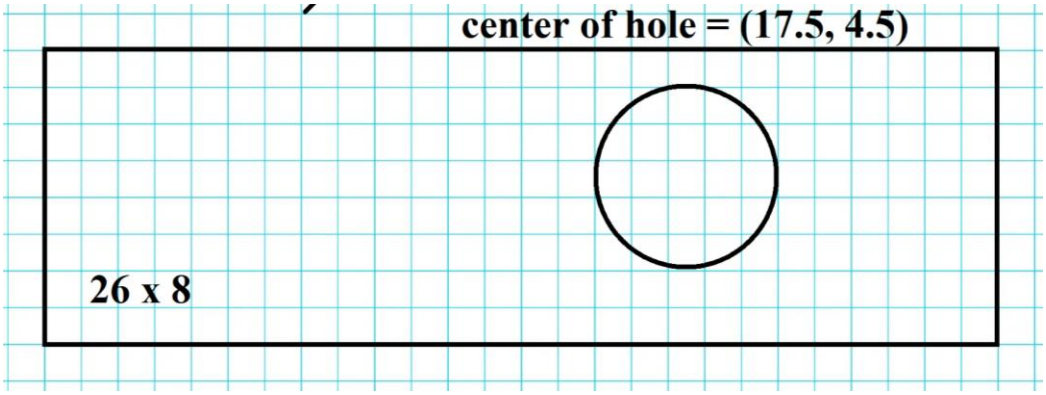
5. E: A two dimensional object, as shown below, can be seen to be made up of three rectangles. The object has a uniform density. Each square has a mass of 2 grams and length of 1 cm. Calculate the center of mass of the object.



6. E: A two dimensional object, as shown below, can be seen to be made up of three rectangles. The object has a uniform density. Each square has a mass of 3 grams and length of 1 cm. Calculate the center of mass of the object.



7. E: A rectangle with a uniform density, as shown below, has a circle removed from it. Each square has a mass of one gram and a length of one cm. Calculate its center or mass.



8. E: A two dimensional circle has a circle cut from it. Determine its center of mass. Each square has a length of one cm and a mass of one gram.