Name_____ Date_____ Period_____

Unit 8

Statics Practice Test

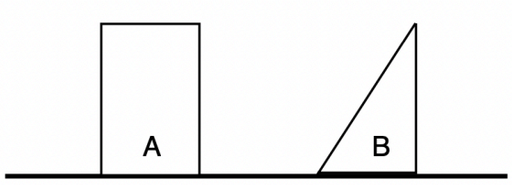
Form P

1. Where is the center of mass of … [Please explain each choice.]
    a. a textbook.

    b. an empty paint can with a missing lid.

    c. a CD.

    d. a doughnut with a big bite taken out of it.



2. The two blocks shown above each have a height of 16.0 cm and a base of 8.00 cm and are made of a uniform material.
    a. Make a sketch of block A on your paper and indicate where you think its center of mass is located. Describe with words how far block A can be tipped before it topples. Now calculate the angle at which it topples.

    b. Make a sketch of block B on your paper and indicate where you think its center of mass is located. Describe with words how far block B can be tipped before it topples. Now calculate the angle at which it topples.

3. A metal rod 3.00 m long is being used as a lever. The fulcrum is located at the center of the rod and a 12.0 N weight is hung at a distance of 1.00 m from it.
    a. How hard must you push on the far end of the rod to balance this load?

    b. How hard would you have to lift on the end of the lever next to the load to raise it?

    c. Suppose a second weight of 6.0 N is hung exactly halfway between the center of the rod and the first mass. Now how hard must you push on the far end to balance the total load?

4. Suppose we are given three masses: $m_1 = 3.0$ kg, $m_2 = 7.0$ kg, and $m_3 = 4.0$ kg.
    a. Find the center of mass of these three when they are arranged in order along a straight line with 30 cm between m_1 and m_2, and 50 cm between m_2 and m_3.

    b. Find the center of mass of the same three masses when they occupy the corners of a right triangle, as shown below, while having the same spacing.

③

①　②

5. Find the location of the center of mass for the earth-moon system.