1. **Center of mass and a see-saw.** Triplets Al, Sal, and Bennie weigh the same.
    a. (3 pt.) Al sits on a see-saw 1 meter from the pivot. How far from the pivot should Sal be for them to balance?
    b. (3 pt.) Al and Sal sit 1 meter from the pivot, and Bennie sits on the opposite end. How far from the pivot should Bennie be for them to balance? For balance, what is the relationship between masses and distances from the pivot?
    c. (3 pts.) Where is the center of mass in each case?
2. **51 Pegasi and its planet** orbit a point that is at the center of mass. (If 51 Pegasi and its planet were sitting on a see-saw, they would balance if the pivot is at the center of mass.) Here we will think about the scale of the motions of a star and its planet by thinking about the earth and the sun. The mass of the earth is 1/1,000,000 that of the sun. The earth is 150 million km from the sun. A year is 30,000,000 s. Ignore the other planets.
    a. (3 pts.) How far is the center of mass of the earth-sun system from the center of the sun?
    b. (3 pts.) Draw a scaled picture of the sun and the location of the center of mass of the earth-sun system. The radius of the sun is 700,000 km. (To see the center of mass, you will need to magnify your drawing.)
    c. (3 pts.) Calculate the speed of the sun as it orbits the center of mass of the earth-sun system. (1 pt.) Can you walk at this speed?
    d. (3 pts.) What was the key observation that refutes the hypothesis that 51 Peg is orbiting another star?