

Calculus Homework

Your Name:

1. Pluto has a diameter of 2274 km. Its major moon, Charon, orbits at a distance of 19,640 km and has a mass that is 0.121 times that of Pluto. Assume that both Pluto and Charon are made of the same stuff and have uniform density.

What is Charon's diameter?

How far above the surface of Pluto is the system's center of mass?

Does Charon orbit around Pluto or does Pluto orbit around Charon?

2. Late in a game of chess, only six pieces remain on the board: Queen (5 grams), two Kings (each 6 gm), Rook (4.5 gm), and two Pawns (each 2 gm). The board itself is square and has a mass of 15 grams. Given the positions of the pieces in the diagram below, where is the center of mass of the system (pieces & board)?

