Problem 1. The lattice constant of a cubic crystal is \( a = 5 \times 10^{-10} \text{ m} \). Compute the distance between two adjacent (012) planes. (2 points)

Problem 2. The lattice constant of a body-centered cubic crystal is \( a = 5 \times 10^{-10} \text{ m} \). How many atoms are in the crystal in a sphere with radius of 1 cm. (2 points)

Problem 3. Compute the smallest distance between the closest two atoms in a face-centered cubic crystal with lattice constant \( a = 5 \times 10^{-10} \text{ m} \). (2 points)